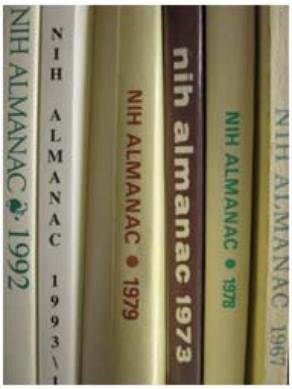
U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

For decades, the media, Congress, Federal administrators and employees, and the wider public have referred to the *NIH Almanac*, a reliable source of information about the National Institutes of Health (NIH), the Federal government's principal medical research agency.



Updated annually, the *Almanac* offers information about NIH's budget, leadership, legislative chronology, and much more, including facts about the research programs and activities of the agency's 27 Institutes and Centers (ICs). This information spans the agency's history, from President Hoover's signing into law of the Ransdell Act (P.L. 71-251)—which transformed the Public Health Service Hygienic Laboratory into the NIH—to the addition of critical, contemporary research imperatives, such as biodefense and biosecurity. As Senator Ransdell said in 1931, the early planners of the NIH "*saw with clear eyes the possibilities of the National Institute of Health for preventing and curing disease with its awful train of suffering and colossal economic losses to the world*."[1] NIH has grown to its preeminent status as the largest source of funding for medical research in the world. Thanks in large part to NIH-funded medical research, Americans today continue to enjoy longer and healthier lives.

More than 83 percent of NIH's $31 billion budget goes to more than 300,000 research personnel at over 3,000 universities, medical schools, and other research institutions in every state and throughout the world. While most ICs receive direct appropriations from the U.S. Congress, from which they award research grants and support scientific programs, non-research funding ICs—located on the agency's campus in Bethesda, Maryland—include the NIH Clinical Center, the agency's combined research hospital and laboratory complex; the Center for Scientific Review, which supports the scientific review of grant applications; and the Center for Information Technology, which provides, coordinates, and manages information technology for the NIH.

Additional information about NIH research funding can be found by visiting the Research Portfolio Online Reporting Tools (RePORT) website at report.nih.gov. RePORT allows users to obtain NIH funding information arranged by health disorder or condition, year, IC, state, Congressional district, funding mechanism, or other category. In addition, the Office of NIH History website features the agency's searchable history archives at history.nih.gov.

The NIH Almanac is compiled and edited by the Office of Communications and Public Liaison, OLIB@od.nih.gov

[1]Radiology, May 1932 Radiology, 18, 942-947. From a presentation before the Radiological Society of North America at the Seventeenth Annual Meeting, at St. Louis, Nov. 30-Dec. 4, 1931.

This page last reviewed on December 21, 2012

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

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Organization

About the National Institutes of Health

NIH OFFICE OF THE DIRECTOR

The Office of the Director (OD) is responsible for setting policy for NIH and for planning, managing, and coordinating the programs and activities of all 27 of NIH's Institutes and Centers. The OD program offices include the Office of AIDS Research, Office of Behavioral and Social Sciences Research, Office of Disease Prevention, and Office of Research on Women's Health, among others.

NIH INSTITUTES

- National Cancer Institute (NCI)
- National Eye Institute (NEI)
- National Heart, Lung, and Blood Institute (NHLBI)
- National Human Genome Research Institute (NHGRI)
- National Institute on Aging (NIA)
- National Institute on Alcohol Abuse and Alcoholism (NIAAA)
- National Institute of Allergy and Infectious Diseases (NIAID)
- National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)
- National Institute of Biomedical Imaging and Bioengineering (NIBIB)
- *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD)
- National Institute on Deafness and Other Communication Disorders (NIDCD)
- National Institute of Dental and Craniofacial Research (NIDCR)
- National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)
- National Institute on Drug Abuse (NIDA)
- National Institute of Environmental Health Sciences (NIEHS)
- National Institute of General Medical Sciences (NIGMS)
- National Institute of Mental Health (NIMH)
- National Institute on Minority Health and Health Disparities (NIMHD)
- National Institute of Neurological Disorders and Stroke (NINDS)
- National Institute of Nursing Research (NINR)
- National Library of Medicine (NLM)

NIH CENTERS

- Center for Information Technology (CIT)
- Center for Scientific Review (CSR)
- Fogarty International Center (FIC)
- National Center for Advancing Translational Sciences (NCATS)

- National Center for Complementary and Alternative Medicine (NCCAM)
- National Center for Research Resources (NCRR) — (April 13, 1962 – December 23, 2011)
- NIH Clinical Center (CC)

This page last reviewed on March 18, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

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National Institutes of Health
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About the NIH

Begun as a one-room Laboratory of Hygiene in 1887, the National Institutes of Health (NIH) today is one of the world's foremost medical research centers. An agency of the Department of Health and Human Services, the NIH is the Federal focal point for health research.

The NIH began in 1887 as a one-room Hygienic Laboratory in this Marine Hospital on Staten Island, New York. The Hygienic Laboratory was located here until 1891, when it was moved to Washington, D.C.

NIH is the steward of medical and behavioral research for the Nation. Its mission is to seek fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to enhance health, lengthen life, and reduce illness and disability.

The goals of the agency are:

- to foster fundamental creative discoveries, innovative research strategies, and their applications as a basis to advance significantly the Nation's capacity to protect and improve health;
- to develop, maintain, and renew scientific human and physical resources that will assure the Nation's capability to prevent disease;
- to expand the knowledge base in medical and associated sciences in order to enhance the Nation's economic well-being and ensure a continued high return on the public investment in research; and
- to exemplify and promote the highest level of scientific integrity, public accountability, and social responsibility in the conduct of science.

In realizing these goals, the NIH provides leadership and direction to programs designed to improve the health of the Nation by conducting and supporting research:

- in the causes, diagnosis, prevention, and cure of human diseases;
- in the processes of human growth and development;
- in the biological effects of environmental contaminants;
- in the understanding of mental, addictive and physical disorders; and
- in directing programs for the collection, dissemination, and exchange of information in medicine and health, including the development and support of medical libraries and the training of medical librarians and other health information specialists.

This page last reviewed on August 14, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

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National Institutes of Health
Turning Discovery Into Health

Office of the Director, NIH

Photo Gallery

The NIH comprises the Office of the Director and 27 Institutes and Centers. The Office of the Director (OD) is the central office at NIH. The OD is responsible for setting policy for NIH and for planning, managing, and coordinating the programs and activities of all the NIH components.

The NIH Director provides overall leadership to NIH activities in both scientific and administrative matters. Although each institute within the NIH has a separate mission, the NIH Director plays an active role in shaping the agency's research agenda and outlook. With a unique and critical perspective on the mission of the entire NIH, the Director is responsible for providing leadership to the institutes for identifying needs and opportunities, especially for efforts that involve several institutes. The NIH Director is assisted by the Principal Deputy Director, who shares in the overall direction of the agency's activities.

In carrying out these responsibilities, the NIH Director stays informed about program priorities and accomplishments through regular staff meetings, discussions, and briefing sessions with OD and institute staff. The Director also receives input from:

- the extramural scientific community, including both individual researchers and scientific organizations
- patient advocacy and voluntary health groups that deal directly with NIH or indirectly through Congress and the media
- the Congress, the Administration, and the Director's Council of Public Representatives, which brings public views to NIH.

Ongoing discussions with these groups and others provide the basis for an established framework within which priorities for the agency are identified, reviewed, and justified.

The following describes the major offices in within the NIH Office of the Director:

RESEARCH, FUNDING, AND COORDINATION

The **Division of Program Coordination, Planning, and Strategic Initiatives (DPCPSI)** was created by the NIH Reform Act of 2006 and provides leadership for identifying, reporting, and funding of trans-NIH research that represents important areas of emerging scientific opportunities, rising public health challenges, or knowledge gaps that merit further research and would benefit from collaboration between two or more NIH Institutes and Centers (ICs), or from strategic coordination and planning. The Division coordinates and oversees the planning, implementation, and evaluation of a series of trans-NIH programs that are supported by the NIH Common Fund. These catalytic programs help support research throughout the biomedical community by providing enabling technologies, services, and programs; developing essential tools and methodologies; and fostering innovation through high risk/high reward programs. DPCPSI includes major programmatic offices that coordinate research and activities related to AIDS, behavioral and social sciences, women's health, disease prevention, dietary supplements, research infrastructure, and science education.

DPCPSI is responsible for developing new approaches to analyze the NIH research portfolio and the development and use of informatics tools for this purpose. The Division also manages NIH-wide evaluation and performance assessment activities, including coordination and preparation of plans and reports required by the Government Performance and Results Act. The Division includes the following Offices:

Program Offices

- **Office of AIDS Research (OAR)** — The OAR plans, coordinates, evaluates, and budgets the NIH AIDS research program, which is carried out by nearly all of the NIH Institutes and Centers. Through its annual trans-NIH planning, budgeting, and portfolio analysis processes, OAR identifies the highest priority areas of scientific opportunity, enhances collaboration, minimizes duplication, and ensures that research dollars are invested effectively. OAR identifies emerging scientific areas that require focused attention; manages and facilitates multi-Institute and trans-Institute activities to address those needs; fosters research by designating funds and supplements to jump-start or pilot program areas; sponsors reviews or evaluations of research program areas; facilitates international AIDS research and training; and supports domestic and international initiatives to enhance dissemination of research findings to researchers, physicians, institutions, communities, constituency groups, and patients.
- **Office of Behavioral and Social Sciences Research (OBSSR)**— The OBSSR furthers the mission of NIH by emphasizing the critical role that behavioral and social factors play in health, health care, and well-being. Established by the U.S. Congress as part of the NIH Office of the Director, its mission is to stimulate behavioral and social sciences research throughout NIH and to integrate it more fully into the NIH research enterprise.

- **Office of Disease Prevention (ODP)** — The mission of the ODP is to work with NIH Institutes and Centers and other Federal and non-Federal partners to provide leadership for the development, coordination, and implementation of activities to increase the scope, support, public health impact, and dissemination of health promotion and disease prevention research supported by the NIH. The Office leads the NIH Prevention Research Coordinating Committee (PRCC), which serves as a venue for exchanging information and making recommendations related to scientific, programmatic, and policy issues. The ODP accomplishes its mission in collaboration with the PRCC and by participating in disease prevention and health promotion activities, including those associated with the US Preventive Services Task Force, the Community Preventive Services Task Force, Healthy People 2020, and the National Prevention Strategy. The ODP also oversees the Tobacco Regulatory Science Program, a trans-NIH collaborative effort with the FDA's Center for Tobacco Products to conduct research to support regulatory activities for tobacco products. The Office coordinates a variety of training and education programs and engages in evidence assessment activities to address controversial medical issues important to healthcare providers, patients, policymakers, and the general public. Additionally, the ODP provides timely, accurate information about health promotion and disease prevention research, programs, and activities to a wide variety of audiences using multi-media tactics.
- **Office of Dietary Supplements (ODS)** — The mission of ODS is to strengthen knowledge and understanding of dietary supplements by evaluating scientific information, stimulating and supporting research, disseminating research results, and educating the public to foster an enhanced quality of life and health for the U.S. population. ODS co-funds research on dietary supplements and sponsors systematic reviews and projects to enhance the incorporation of these reviews into nutrition research. ODS provides accurate and up-to-date scientific information about dietary supplements.
- **Office of Research Infrastructure Programs (ORIP)** — The ORIP provides the research infrastructure and programs to ensure NIH effectively addresses and coordinates important areas of emerging scientific opportunities. The trans-NIH nature of ORIP includes coordinating research, training, and science education efforts to advance medical research in all disease areas across basic, translational, and clinical research. ORIP supports programs that offer access to state-of-the-art instrumentation, develops and provides access to critical animal models, trains veterinary scientists to become partners in research, funds research facilities improvement projects, and supports comprehensive science education efforts to improve science literacy in adults and children.
- **Office of Research on Women's Health (ORWH)** — The ORWH promotes women's health and sex differences research within and beyond the NIH. Since its creation by NIH in 1990, ORWH has worked to ensure that women and minorities are included in NIH-supported clinical research--research that ultimately benefits women's health. ORWH establishes the NIH strategic plan for research on women's health and, in partnership with NIH Institutes and Centers (ICs), co-funds research on the role of sex and gender in health and disease. ORWH' mission also extends to career support for women and men in biomedical careers and women's health research. ORWH leads the effort to monitor adherence to NIH's inclusion policies, in collaboration with NIH ICs, the NIH Office of Extramural Research, and the NIH Office of Intramural Research.
- **Office of Strategic Coordination (OSC)** — The OSC coordinates The NIH Common Fund. The Common Fund was enacted into law by Congress through the 2006 NIH Reform Act to support cross-cutting, trans-NIH programs that require participation by at least two NIH Institutes or Centers (ICs) or would otherwise benefit from strategic planning and coordination. The requirements for the Common Fund encourage collaboration across the ICs while providing the NIH with flexibility to determine priorities for Common Fund support. To date, the Common Fund has been used to support a series of short term, exceptionally high impact, trans-NIH programs. The intent of NIH Common Fund programs is to provide a strategic and nimble approach to address key roadblocks in biomedical research that impede basic scientific discovery and its translation into improved human health. In addition, these programs capitalize on emerging opportunities to catalyze the rate of progress across multiple biomedical fields. Common Fund programs are expected to transform the way a broad spectrum of health research is conducted. Initiatives that comprise Common Fund programs are intended to be catalytic in nature by providing limited term investments (up to 10 fiscal years) in strategic areas to stimulate further research through IC-funded mechanisms.

Staff Offices

- **Office of Portfolio Analysis (OPA)** — The OPA analyzes data on NIH-supported research to inform trans-NIH planning and coordination; uses databases, analytic tools, methodologies and other resources to conduct assessments in support of portfolio analyses and priority setting in scientific areas of interest across NIH; researches and develops new analytic tools, and support systems to enhance the management of the NIH's scientific portfolio; and provides in coordination with other NIH organizations, training on portfolio analysis tools, procedures, and methodology.
- **Office of Program Evaluation and Performance (OPEP)** — The OPEP plans, conducts, coordinates, and supports program evaluations, including IC-specific program and project evaluations and trans-NIH evaluations; manages and administers NIH's Evaluation Set-Aside Program; coordinates the preparation of plans and reports required by the Government Performance and Results Act (GPRA), and identifies and advises on emerging issues that have implications for program evaluation and performance reporting for the NIH.

Office of Extramural Research (OER)

The Office of Extramural Research provides the corporate framework for the NIH research administration and works to ensure the scientific integrity, public accountability, and effective stewardship of the NIH research grant portfolio.

Office of Intramural Research (OIR)

The Office of Intramural Research is responsible for oversight and coordination of intramural research, training, and technology transfer conducted internally within the federal laboratories and clinics of the National Institutes of Health. Comprising approximately 10% of the NIH budget, the intramural research program, spread across 24 NIH institutes and centers, includes the NIH Clinical Center research hospital and the National Library of Medicine. The program supports approximately 1,100 principal investigators and 7,500 scientific staff.

COMMUNICATIONS

Office of Communications and Public Liaison (OCPL)

The Office of Communications and Public Liaison advises the Director and communicates information about NIH policies, programs, and research results to the general public. OCPL also encourages broad national public participation in NIH activities, helps to resolve local community concerns, and coordinates how NIH implements the Freedom of Information Act.

POLICY

Office of Science Policy (OSP)

The Office of Science Policy advises the NIH Director on science policy issues affecting the medical research community; participates in the development of new

policy and program initiatives; monitors and coordinates agency planning and evaluation activities; plans and implements a comprehensive science education program; and develops and implements NIH policies and procedures for the safe conduct of recombinant DNA activities.

Office of Legislative Policy and Analysis (OLPA)
The Office of Legislative Policy and Analysis serves as the principal legislative policy, analysis, and development office for the Director and other senior NIH staff; develops legislative policy and proposals; and provides analysis and liaison with Congress, the U.S. Department of Health and Human Services, and other Federal agencies on issues affecting NIH programs and activities.

ADMINISTRATION AND SERVICES

Executive Office (ODEO)
The Executive Office serves in both a staff and an operational capacity for all administrative management activities for the Office of the Director (OD), excluding the Office of Research Services.

NIH Ethics Office
The NIH Ethics Office provides oversight and strategic direction of NIH activities relating to ethics policy, oversight, and operational activities; develops and administers the NIH policies and procedures for implementing the Government-wide conflict of interest statutes and regulations, the HHS supplemental conflict of interest regulations, and HHS policies; implements a program for trans-NIH ethics oversight that includes information technology (IT) support systems, periodic reviews, audits, delegations of authority, training, and records management; determines real or potential conflicts of interest and assesses ethical considerations in scientific reporting, clinical trials, and scientific conferences and workshops; and serves as the liaison and coordinates the NIH response to requests from Congress, the Inspector General, HHS, and the Office of Government Ethics, and performs appropriate liaison activities.

Office of the Chief Information Officer (OCIO)
The Office of the Chief Information Officer provides leadership and management support to empower NIH Institutes and Centers to acquire, manage and deliver IT solutions in ways that are innovative, well planned, secure and fiscally responsible. In this way, OCIO ensures that all Information and Information Technology used by the NIH supports the business needs in the best possible way.

Office of Equal Opportunity and Diversity Management (OEODM)
The Office of Equal Opportunity and Diversity Management serves as the focal point for NIH-wide policy formulation, implementation, coordination, and management of the civil rights, equal opportunity, affirmative employment, and workforce diversity programs of the NIH.

Office of Management (OM)
The NIH Office of Management (OM) is located within the Office of the Director and is responsible for administrative and financial functions of the NIH. The OM advises the Director and Deputy Director, on all phases of NIH-wide administration and oversees NIH interactions with the Inspector General, the Department of Health and Human Services, and the General Accounting Office. The OM includes the following offices:

- **Office of Acquisition and Logistics Management (OALM)**
  OALM advises the NIH Director and staff on acquisition and logistics activities and contract and grant financial advisory services; provides leadership and guidance to NIH components on acquisition and logistics administration and management; and develops/implements policies, provides oversight, and manages the operational components in the areas of acquisition and logistics management.
- **Office of Budget (OB)**
  OB is the central NIH office responsible for budget policy, planning, analysis, formulation, justification, presentation, and execution of annual appropriations in concert with 27 Institutes and Centers (ICs). It operates as the NIH focal point for the interpretation, preparation, dissemination, and implementation of financial policies and procedures. OB advises the NIH Director on budgetary issues, and functions as the budget liaison with HHS, OMB, and Congress.
- **Office of Financial Management (OFM)**
  OFM provides central accounting and reporting for all financial transactions that originate from the 27 Institutes and Centers (ICs). OFM also provides overall direction and leadership to the ICs by establishing financial management policies and procedures and by providing oversight of the NIH Core Financial Management Systems. OFM is the focal point for audits, travel policy, central services funds management, and the general ledger.
- **Office of Human Resources (OHR)**
  OHR advises the NIH Director and staff on strategic and tactical human resource (HR) management; directs HR management services; provides NIH leadership and planning on Human Capital program development, salary administration, corporate recruitment, employee and management development; conducts studies and makes recommendations for new or redirected HR efforts, programs, and policies; and supports HR information systems.
- **Office of Management Assessment (OMA)**
  OMA provides expert advice to the Deputy Director for Management and other NIH leadership officials on program integrity, risk management, liaison with outside audit organizations, and management support systems. OMA implements NIH-wide programs in each of these areas to safeguard the assets and preserve the public trust in NIH, and to provide management systems that support administrative processes within the agency.
- **Office of Research Facilities Development and Operations (ORF)** supports the advancement of NIH scientific and program priorities by planning, designing, constructing, managing, and maintaining state-of-the-science facilities critical to new and expanding research initiatives and the NIH mission. ORF is the single point of accountability for all NIH facility activities and is responsible for assisting the NIH Director with the formulation and execution of the Buildings and Facilities appropriation; developing and maintaining policies and standards governing the use of real property; planning and directing facility-related services such as master planning and construction, renovation, maintenance, and management of real property; providing centralized acquisition services for architecture, engineering, and construction contracting and for real property purchasing and leasing activities; and protecting the NIH environment.
- **Office of Research Services (ORS)** provides a comprehensive portfolio of services to support the biomedical research mission of the NIH. Some examples of the diverse services ORS provides include: laboratory safety, security and emergency response, veterinary resources, the NIH Library, events management, travel and transportation, services for foreign scientists, and programs to enrich and enhance the NIH worksite.
- **Office of Strategic Planning for Administration (OSPA)**

OSPA provides assistance to the NIH administrative management leadership with the development and implementation of strategic plans, programs, and support activities to achieve the long-term goals of the NIH mission.

- **NIH Business System**
  The NIH Business System (NBS) is the central electronic business system of the NIH including the general ledger, finance, budget, procurement, supply, travel, and property management systems. NBS is aimed at improving data consolidation and financial reporting capabilities.

Office of the Ombudsman/Center for Cooperative Resolution

The NIH Office of the Ombudsman, Center for Cooperative Resolution provides the NIH community with confidential and informal assistance in resolving work-related conflicts, disputes and grievances; promotes fair and equitable treatment within NIH; offers effective, efficient and innovative dispute resolution services; helps people use non-adversarial approaches in resolving disputes; and works toward improving the overall quality of worklife at NIH.

This page last reviewed on May 17, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
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Recent Photos from the NIH Office of the Director (OD)

2012 PHOTOS

Celebration of Science
On September 8, 2012, NIH hosted a day of presentations and events as part of a 3-day "Celebration of Science," in collaboration with FasterCures, the Milken Institute's Center for Accelerating Medical Solutions. Here, Francis Collins, Elias Zerhouni, and Harold Varmus discuss the past, present and future of NIH with Michael Miliken.

lo-res

Weight of the Nation
On May 8, 2012, Francis Collins spoke at an advanced NIH campus screening of the documentary "Weight of the Nation," produced by HBO in association with NIH and major research and health organizations to spotlight the science of obesity and NIH's efforts to combat this epidemic.
lo-res | hi-res

The Common Fund's Extracellular RNA Communication program
RNA, once thought to exist only within cells, is now known to be exported from cells and play a role in newly discovered mechanisms of cell-to-cell communication. The Common Fund's **Extracellular RNA Communication program** aims to discover fundamental biological principles of extracellular RNA (exRNA), and explore the possibility of using exRNAs as disease biomarkers or therapeutic molecules. Photo courtesy Dr. Bruce Fuchs, Director, OSE.
lo-res | hi-res

NIH Directors Transformative Research Award Artwork
This original artwork was produced to represent the NIH Directors Transformative Research Award. The TRA was created specifically to support exceptionally innovative and/or unconventional research projects that have the potential to create or overturn fundamental paradigms. Photo courtesy Dr. Bruce Fuchs, Director, OSE.
lo-res | hi-res

NIMH Activity
Young children participate in a tricky game called "Fooling the Brain" at an NIH exhibit activity hosted by the National Institute of Mental Health at the 2012 USA Science and Engineering Festival. Photo courtesy Dr. Bruce Fuchs, Director, OSE.
lo-res | hi-res

Boy with Brain
A boy touches a human brain to see how it feels at an NIH exhibit activity hosted by the National Institute on Drug Abuse at the 2012 USA Science and Engineering Festival. Photo courtesy Dr. Bruce Fuchs, Director, OSE.
lo-res | hi-res

NIDDK Activity
Three young children participate in the NIH "Where's the Sugar" exhibit activity hosted by the National Institute of Diabetes and Digestive and Kidney Diseases at the 2012 USA Science and Engineering Festival. Photo courtesy Dr. Bruce Fuchs, Director, OSE.
lo-res | hi-res

NIDA Brain Derby
Young children play a fast-moving and fun game called "Brain Derby" at an NIH exhibit activity hosted by the National Institute on Drug Abuse at the 2012 USA Science and Engineering Festival. Photo courtesy Dr. Bruce Fuchs, Director, OSE.
lo-res | hi-res

mheath Winter Institute
Working together in small groups, researchers at the NIH mHealth Winter Training Institute learned how to develop their wireless and mobile research interests. Participants in the photo (from left to right): Marcos Reyes Estrada, Kirby Lee, Hee Yun Lee, Lin Wang, Dara Sorkin, Marisa

Hilliard, Flaura Winston and Miryam Gerdine.

lo-res | hi-res

OBSSR Retreat

OBSSR convened a retreat for NIH staff trained/employed in behavioral and social sciences research on Monday, Oct. 22, 2012. The purpose of the retreat was to strengthen the internal BSSR community at NIH and foster enhanced collaboration. In the photo (from left to right): Dr. Robert Kaplan, Dr. Deborah Olster, Dr. Virginia S. Cain, and Dr. Norman B. Anderson.

lo-res | hi-res

2011 PHOTOS

NIH and World AIDS Day

On November 8, 2011, Francis Collins and NIAID director Dr. Anthony Fauci visited outside the NIH Clinical Center with Secretary of State Hillary Clinton, who spoke at NIH's Masur Auditorium in advance of World Aids Day.

lo-res | hi-res

NIH Research Festival

NIH Environmental Management System's sustainable laboratory practices working group members Minoo Shaloury-Elizeh, of NIDDK, and Dr. Jean Tiong-Koehler, of NINDS, share information on the Labs Go Greener effort with NIAID's Ningna Huang at the 25th anniversary NIH Research Festival, held October 24-28, 2010

lo-res | hi-res

Lasker Scholars Symposium

A March 31 symposium launched the NIH-Lasker Clinical Research Scholars Program, an intramural-extramural partnership which supports a small number of exceptional early career clinical researchers and promotes their development to fully independent research positions. At the kickoff symposium for the collaboration were (from l) Lasker Foundation Chair Emeritus James Fordyce, Dr. Charles Sawyers, Dr. Christine Seidman, Dr. Maria Freire, Dr. Daniel Kastner, Dr. Harold Varmus, Dr. Francis Collins, Dr. Michael Gottesman, Dr. Marston Linehan and Lasker Foundation chair Dr. Alfred Sommer.

lo-res | hi-res

Early Independence Awards

The NIH Common Fund, part of the Division of Program Coordination, Planning, and Strategic Initiatives (DPCPSI) awarded its first NIH Director's Early Independence Award to 10 exceptional junior investigators.

lo-res

2010 PHOTOS

USA Science & Engineering Festival

Dr. Francis Collins talks with students from Duke University at the first USA Science & Engineering Festival, held October 23-24, 2010 on the National Mall in Washington, D.C.

lo-res | hi-res

USA Science & Engineering Festival

Dr. Francis Collins performs at the USA Science & Engineering Festival.

lo-res | hi-res

Pioneer Awards

Francis Collins and the 2010 recipients of the NIH Director's Pioneer Award supporting individual scientists of exceptional creativity who propose pioneering approaches to major challenges in biomedical and behavioral research.

lo-res | hi-res

Marshall W. Nirenberg Exhibit

Francis Collins and Dr. Myrna Weissman, widow of Dr. Marshall W. Nirenberg, stand before an exhibit honoring NIH's first intramural Nobelist.

lo-res | hi-res

ORWH 20th Anniversary Symposium

First Office of Women's Research and Health director Vivian W. Pinn speaks at ORWH's 20th Anniversary Symposium, held September 27, 2010. Past accomplishments were discussed, as well as a preview of the next decade, "A Vision for the Year 2020" Photo by Bill Branson.

lo-res

2009 PHOTOS

Presidential Campus Visit

On September 30, HHS Secretary Kathleen Sebelius, Dr. Francis Collins and President Barack Obama toured the Mark O. Hatfield Clinical Research Center at NIH.

lo-res

| hi-res

Rock Stars of Science

NIH Director Francis Collins performing live on Capitol Hill with Aerosmith's Joe Perry and NIH grantee Rudy Tanzi, Ph.D. of Harvard for the "Rock Stars of Science" campaign sponsored by the Geoffrey Beene Foundation.

lo-res | hi-res

IH Directors

Dr. Francis S. Collins stands with past directors Elias A. Zerhouni, Harold E. Varmus, and James B. Wyngaarden.

lo-res

Francis Collins Sworn in

Dr. Francis Collins, joined by wife Diane Baker, is sworn in as the 16th NIH director by head of NIH human resources Chris Major on August 17, 2009.

lo-res | hi-res

This page last reviewed on August 5, 2013

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National Cancer Institute National Institutes of Health | www.cancer.gov

Mission | Important Events | Legislative Chronology | Director | Programs

MISSION

The National Cancer Institute (NCI) is part of the National Institutes of Health (NIH), which is one of 11 agencies that compose the Department of Health and Human Services (HHS). The NCI, established under the National Cancer Institute Act of 1937, is the Federal Government's principal agency for cancer research and training. The National Cancer Act of 1971 broadened the scope and responsibilities of the NCI and created the National Cancer Program. Over the years, legislative amendments have maintained the NCI authorities and responsibilities and added new information dissemination mandates as well as a requirement to assess the incorporation of state-of-the-art cancer treatments into clinical practice.

The National Cancer Institute coordinates the National Cancer Program, which conducts and supports research, training, health information dissemination, and other programs with respect to the cause, diagnosis, prevention, and treatment of cancer, rehabilitation from cancer, and the continuing care of cancer patients and the families of cancer patients. Specifically, the Institute:

- Funds and coordinates research projects conducted by universities, hospitals, research foundations, and businesses throughout this country and abroad through research grants and cooperative agreements.
- Conducts research in its own laboratories and clinics.
- Supports education and training in fundamental sciences and clinical disciplines for participation in basic and clinical research programs and treatment programs relating to cancer through career awards, training grants, and fellowships.
- Supports research projects in cancer control.
- Supports a national network of cancer centers.
- Collaborates with voluntary organizations and other national and foreign institutions engaged in cancer research and training activities.
- Encourages and coordinates cancer research by industrial concerns where such concerns evidence a particular capability for programmatic research.
- Collects and disseminates information on cancer.
- Supports construction of laboratories, clinics, and related facilities necessary for cancer research through the award of construction grants.

For additional information about NCI and recent cancer research findings, visit the NCI Web site at http://cancer.gov

IMPORTANT EVENTS IN NCI HISTORY

August 5, 1937—President Franklin D. Roosevelt signed the National Cancer Institute Act.

November 9, 1937—The National Advisory Cancer Council held its first meeting.

November 27, 1937—The Surgeon General awarded first grants-in-aid on the recommendation of the National Advisory Cancer Council.

January 3, 1938—The National Advisory Cancer Council recommended approval of first awards for fellowships in cancer research.

August 1940—The *Journal of the National Cancer Institute* published its first issue.

July 1, 1946—The cancer control program was established with appropriations to the states for support of cancer control activities. Staff was organized into 6 sections: biology, biochemistry, biophysics, chemotherapy, epidemiology, and pathology.

July 1, 1947—NCI reorganized to provide an expanded program of intramural cancer research, cancer research grants, and cancer control activities.

November 13, 1947—The Research Grants and Fellowship Branch was established. It became the administrative arm of the Advisory Council.

October 1948—A grants program to medical, dental, and osteopathic schools was initiated for improvement of training in the field of cancer research, diagnosis, and treatment.

July 2, 1953—NCI inaugurated a full-scale clinical research program in the new Clinical Center.

April 1955—The Cancer Chemotherapy National Service Center was established in the institute to coordinate the first national, voluntary, cooperative cancer chemotherapy program.

1957—The first malignancy (choriocarcinoma) was cured with chemotherapy at NCI.

November 1959—The *Journal of the National Cancer Institute* inaugurated a series of occasional publications as *Monographs* to be used for in-depth scientific communications in specific subject areas.

September 13, 1960—The NCI director appointed an associate director for grants and training, associate director for field studies, and associate director for collaborative research.

January 12, 1961—The Laboratory of Viral Oncology was established to investigate the relationship of viruses to human cancer.

April 2, 1962—An exhibit, "Man Against Cancer," opened in Washington, D.C., to commemorate the institute's 25th anniversary and inaugurate Cancer Progress Year.

May 7, 1962—The Acute Leukemia Task Force held its first meeting. It focused the combined efforts and resources of scientists on studies of therapy of the acute leukemia patient, and was the forerunner of other task forces on specific forms of cancer.

October 25, 1962—The Human Cancer Virus Task Force held its first meeting. The task force, of scientists from NCI and other institutions, stimulated the development of special programs in viral oncology.

1963—Studies were initiated at NCI in Hodgkin's disease with combination chemotherapy.

December 1964—The report of the President's Commission on Heart Disease, Cancer, and Stroke was published.

January 11, 1966—NCI reorganized to coordinate related activities. Scientific directors oversaw three newly established scientific divisions: etiology, chemotherapy, and a group of discipline-oriented laboratories and branches referred to as general laboratories and clinics. Two associate directors were named for program and for extramural activities.

February 13, 1967—A cancer research center, USPHS Hospital, was established in Baltimore by the institute to conduct an integrated program of laboratory and clinical research.

April 27, 1970—At the request of Senator Ralph W. Yarborough, chairman of the Committee on Labor and Public Welfare, the Senate approved the establishment of the National Panel of Consultants on the Conquest of Cancer.

November 25, 1970—The national panel of consultants submitted to the Senate committee a report entitled "National Program for the Conquest of Cancer."

October 18, 1971—President Nixon converted the Army's former biological warfare facilities at Fort Detrick, Maryland, to house research activities on the causes, treatment, and prevention of cancer.

December 23, 1971—President Nixon signed the National Cancer Act of 1971.

July 27, 1972—A Bureau-level organization was established for NCI, giving the institute and its components organizational status commensurate with the responsibilities bestowed on it by the National Cancer Act of 1971. Under the reorganization, NCI was composed of the Office of the Director and 4 divisions: Cancer Biology and Diagnosis, Cancer Cause and Prevention, Cancer Treatment, and Cancer Grants (renamed successively the Division of Cancer Research, Resources and Centers, and later the Division of Extramural Activities).

June 20, 1973—NCI director Dr. Frank J. Rauscher, Jr., announced that 8 institutions were recognized as Comprehensive Cancer Centers to bring results of research as rapidly as possible to a maximum number of people. Additional centers were announced on November 2, 1973; June 13, 1974; October 18, 1974; April 8, 1976; December 30, 1976; July 27, 1978; and March 2, 1979, increasing the number of Comprehensive Cancer Centers to 20. (In July 2000 there are 37.)

September 5, 1973—The President transmitted to Congress the first annual report of the director of the National Cancer Program, a 5-year strategic plan for the program, and the report of the National Cancer Advisory Board. Preparation and transmittal of the documents were mandated by the National Cancer Act of 1971.

September 10, 1974—The Division of Cancer Control and Rehabilitation was established to plan, direct, and coordinate an integrated program of cancer control and rehabilitation activities with the goal of identifying, testing, evaluating, demonstrating, communicating, and promoting the widespread use of available and new methods for reducing cancer incidence, morbidity, and mortality.

September 12, 1974—NCI made its first cancer control awards to state health departments for a 3-year program to screen low-income women for cancer of the uterine cervix. At its peak in 1978, the program had grown to a total of 32 states and territories.

December 17, 1974—NCI and the National Library of Medicine established CANCERLINE, a jointly developed computerized service to provide scientists across the

country with information on cancer research projects and published findings.

December 19, 1974—The Clinical Cancer Education Program was announced to develop more innovative teaching methods in cancer prevention, diagnosis, treatment, and rehabilitation in schools of medicine, dentistry, osteopathy, and public health; affiliated teaching hospitals; and specialized cancer institutions.

1975—The Cooperative Minority Biomedical Program, as approved by the National Cancer Advisory Board, represented a cofunding effort by NCI to implement and foster cancer research through NIH's Division of Research Resources' Minority Biomedical Research Support Program and the NIGMS Minority Access to Research Careers Program.

July 1, 1975—The Cancer Information Service (CIS) was established on July 1, 1975, following the mandate of the National Cancer Act of 1971, which gave NCI new responsibilities for educating the public, patients, and health professionals.

August 5, 1977—NCI celebrated its 40th anniversary with a ceremony on the NIH campus. Senator Warren G. Magnuson of Washington who, as a member of the House of Representatives, introduced a bill to establish the NCI in 1937, sent a message stating: "Those one and a half million Americans who are alive today—cured of cancer—are ample justification for all that we've appropriated over the last 40 years."

1979—The first human RNA virus (HTLV-I) was discovered by NCI's Dr. Robert C. Gallo.

July 18, 1979—NCI and the National Naval Medical Center, Bethesda, Md., signed an agreement to cooperate in a cancer treatment research program.

July 10, 1980—The U.S. Department of Health and Human Services (HHS) Secretary Patricia Roberts Harris approved institute-wide reorganization. A newly created Division of Resources, Centers, and Community Activities incorporated functions of the former Division of Cancer Control and Rehabilitation and programs for education, training, construction, cancer centers, and organ site research of the former Division of Cancer Research, Resources, and Centers (DCRRC). Other activities of the DCRRC were incorporated into the new Division of Extramural Activities.

April 27, 1981—A new Biological Response Modifiers Program was established in the Division of Cancer Treatment to investigate, develop and bring to clinical trials potential therapeutic agents that may alter biological responses that are important in the biology of cancer growth and metastasis.

September 1982—PDQ, a computerized database on cancer treatment information, became available nationwide via the National Library of Medicine's MEDLARS system.

December 16, 1982—NCI purchased what is now the R. A. Bloch International Cancer Information Center through generous donations to the NCI Gift Fund. This building houses the *Journal of the National Cancer Institute*; the Scientific Information Branch, which publishes *Cancer Treatment Reports* and *Cancer Treatment Symposia*; the International Cancer Research Data Bank; and PDQ.

July 16, 1983—NCI launched the Community Clinical Oncology Program (CCOP) to establish a cancer control effort that combines the expertise of community oncologists with NCI clinical research programs. The CCOP initiative is designed to bring the advantages of clinical research to cancer patients in their own communities.

September 1983—The Office of International Affairs was reorganized to add a Scientific Information Branch and a Computer Communications Branch. The Scientific Information Branch is composed of a literature research section, cancer treatment reports section, *Journal of the National Cancer Institute* section, and the international cancer research data bank section.

Community Clinical Oncology Program, an NCI resource that links community-based physicians with cooperative groups and cancer centers for participation in institute-approved clinical trials, was created.

December 5, 1983—The name of the Division of Cancer Cause and Prevention was changed to the Division of Cancer Etiology.

The Division of Resources, Centers and Community Activities was renamed the Division of Cancer Prevention and Control (DCPC) to emphasize the division's roles in cancer prevention and control research.

1984—A policy statement regarding the relationship of NCI, the pharmaceutical industry, and NCI-supported cooperative groups was developed. The statement articulates the need for collaboration between NCI and the pharmaceutical industry in pursuing the joint development of anticancer drugs of mutual interest. It also sets forth guidelines for the handling of issues such as the joint sponsorship of trials, the sharing of information between sponsors, maintaining the confidentiality of certain classes of data, the funding of cooperative groups by drug companies, the review of protocols, and the publication of results.

The Comprehensive Minority Biomedical Program, DEA, was established to widen the focus of the minority effort along lines of the programmatic thrusts of the institute, thereby giving it trans-NCI responsibilities.

The Cancer Control Science program was established in DCPC to develop programs in health promotion research and to stimulate widespread application of existing cancer control knowledge. Branches include health promotion sciences, cancer control applications and cancer training.

March 6, 1984—HHS Secretary Margaret M. Heckler launched a new cancer prevention awareness program by NCI to inform the public about cancer risks and steps individuals can take to reduce risk.

April 1984—An NCI scientist, Dr. Robert C. Gallo, reported the isolation of a new group of viruses found in the helper T-cells of patients with AIDS or pre-AIDS symptoms, as well as from healthy individuals at high risk for developing AIDS. These viruses were ultimately named human immunodeficiency virus or HIV. This discovery made the control of blood-product-transmitted AIDS feasible by enabling the development of a simple test for the detection of AIDS-infected blood by

blood banks and diagnostic laboratories.

August 1985—The Cancer Prevention Fellowship Program, one of the first formal postdoctoral research training programs in cancer prevention, began.

November 10, 1986—The International Cancer Information Center was established in the Office of International Affairs, NCI Office of the Director.

May 1987—As part of NIH's centennial celebration year, NCI commemorated its 50th anniversary.

October 15, 1987—The DCPC established the Laboratory for Nutrition and Cancer Research with the basic nutrition science section and the clinical/metabolic human studies section.

October 24, 1987—The Office of Technology Development was established in the NCI Office of the Director as the institute's focal point for the implementation of pertinent legislation, rules and regulations, and the administration of activities relating to collaborative agreements, inventions, patents, royalties, and associated matters.

October 26, 1987—The DCT abolished the following branches, sections, and laboratory: the chromosome structure and function section in the Laboratory of Molecular Pharmacology; the Drug Evaluation Branch and its sections; the drug synthesis section and the acquisition section in the Drug Synthesis and Chemistry Branch; the fermentation section and the plant and animal products section in the Natural Products Branch; the chemical resources section, the analytical and product development section and the clinical products section in the Pharmaceutical Resources Branch; the Extramural Research and Resources Branch; and the Animal Genetics and Production Branch; the sections of the Information Technology Branch; the Laboratory of Experimental Therapeutics and Metabolism and its sections; the sections of the Laboratory of Pharmacology and Experimental Therapeutics.

The DCT changed the name of the Laboratory of Pharmacology and Experimental Therapeutics to the Laboratory of Biochemical Pharmacology. The division also established the Laboratory of Medicinal Chemistry, Pharmacology Branch, Biological Testing Branch, and Grants and Contracts Operations Branch.

1988—In DCT's Clinical Oncology Program, the Clinical Pharmacology Branch merged with the Medicine Branch.

The International Cancer Information Center established a separate office in the NCI Office of the Director.

January 1988—NCI journals *Cancer Treatment Reports* and *Journal of the National Cancer Institute* were consolidated into a biweekly *Journal of the National Cancer Institute*.

September 30, 1988—The first Consortium Cancer Center was established, comprised of three historically black medical schools. Component universities supported by this core grant—Charles R. Drew University of Medicine and Science in Los Angeles, Meharry Medical College in Nashville, and Morehouse School of Medicine in Atlanta—focus their efforts on cancer prevention, control, epidemiology, and clinical trials.

April 1989—The NCI-initiated mechanism of supplementing research grants to encourage recruitment of minority scientists and science students into extramural research laboratories is published as an NIH-wide extramural program announcement. This initiative will be expanded to cover science students and scientists who are women or persons with disabilities.

May 22, 1989—NCI scientist Dr. Steven A. Rosenberg conducted the first human gene transfer trial using human tumor-infiltrating lymphocytes to which a foreign gene has been added.

September 14, 1990—Scientists from NCI and NHLBI conducted the first trial in which a copy of a faulty gene was inserted into white blood cells to reverse the immune deficiency it causes. This was the first human gene therapy trial and adenosine deaminase deficiency was treated.

December 19, 1990—The institute began its year-long celebration of the 20th anniversary of the National Cancer Act by inaugurating a series of articles in the *Journal of the National Cancer Institute*. The series described the growth in knowledge that has occurred in cancer research since 1971.

January 29, 1991—The first human gene therapy to treat cancer was started. Patients with melanoma were treated with tumor-infiltrating lymphocytes to which a gene for tumor necrosis factor has been added.

September 24, 1991—Congress held a special hearing to commemorate the 20th anniversary of the National Cancer Act. Dr. Samuel A. Broder, NCI director, thanked Congress for its "consistent vision, leadership, and commitment to the goal of alleviating the death and suffering caused by cancer in this country."

October 1991—NCI began its Five-a-Day program, in partnership with the nonprofit group Produce for Better Health, to encourage Americans to eat at least 5 fruits and vegetables a day.

December 18, 1992—Taxol (paclitaxel), an anticancer drug extracted from the bark of the Pacific yew, received approval by the U.S. Food and Drug Administration (FDA) for the treatment of ovarian cancer that has failed other therapy. NCI spearheaded the development of the drug through collaboration with the USDA's Forest Service, the Department of the Interior's Bureau of Land Management, and Bristol-Myers Squibb Company, made possible by the Federal Technology Transfer Act of 1986.

November 1993—The Prostate, Lung, Colorectal, and Ovarian trial, designed to determine whether certain screening tests will reduce the number of deaths from these cancers, began recruiting 148,000 men and women, ages 55-74.

February 1995—The results of the Community Intervention Trial for Smoking Cessation were completed and published.

1995/1996—NCI leadership initiated a major reorganization, based on recommendations of the Ad Hoc Working Group of the National Cancer Advisory Board and NCI streamlining work groups and quality improvement teams. Two extramural divisions were created—the Division of Cancer Treatment, Diagnosis, and Centers and the Division of Cancer Biology. Two intramural divisions were also created—the Division of Basic Sciences and the Division of Clinical Sciences—and one combined intramural/extramural division—the Division of Cancer Epidemiology and Genetics. The Divisions of Cancer Prevention and Control and Extramural Activities remain a part of the NCI structure, but in the extramural program.

November 1996—Cancer mortality rates decline nearly 3% between 1991 and 1995, the first sustained decline since national record keeping was instituted in the 1930s.

1996—The NCI Office of Liaison Activities was established to ensure that advocates have input concerning NCI research and related activities. The office supports NCI's research and programs by fostering strong communications and partnerships with the cancer advocacy community, professional societies, and Federal agencies.

August 1, 1997—NCI, in partnership with government, academic, and industrial laboratories, launched the Cancer Genome Anatomy Project with 2 overall goals: to enhance discovery of the acquired and inherited molecular changes in cancer and to evaluate the clinical potential of these discoveries. The project included a website allowing scientists to rapidly access data generated through the project and apply it to their studies.

October 1997—NCI reorganization continued, with the creation of the Division of Cancer Prevention and the Division of Cancer Control and Population Sciences from the former Division of Cancer Prevention and Control and the extramural component of the Division of Cancer Epidemiology and Genetics.

1997—The NCI Director's Consumer Liaison Group was established to advise and provide recommendations to the NCI Director from the perspective and viewpoint of cancer advocates on a wide variety of issues, programs, and research priorities and to maintain strong collaborations between NCI and the advocacy community.

March 1998—Cancer incidence rates showed first sustained decline since NCI began keeping records in 1973. The rates dropped 0.7% per year from 1990 to 1995. Cancer mortality rates continued to decline.

April 6, 1998—Results of the Breast Cancer Prevention Trial, testing the effectiveness of tamoxifen to prevent the disease, were announced 14 months earlier than expected: women taking tamoxifen had 45% fewer breast cancer diagnoses than women on the placebo, proving that breast cancer can be prevented. Rare but serious side effects—endometrial cancer and blood clots—were shown to occur in some postmenopausal women on tamoxifen. A study to compare tamoxifen to another, potentially less toxic drug was planned for fall 1998.

September 25, 1998—The FDA approved the monoclonal antibody Herceptin (Trastuzumab) for the treatment of metastatic breast cancer in patients with tumors that produce excess amounts of a protein called HER-2. (Approximately 30% of breast cancer tumors produce excess amounts of HER-2.)

May 25, 1999—The Study of Tamoxifen and Raloxifene, or STAR, one of the largest breast cancer prevention studies ever, began recruiting volunteers at more than 400 centers across the United States, Puerto Rico, and Canada. The trial will include 22,000 postmenopausal women at increased risk of breast cancer to determine whether the osteoporosis prevention drug raloxifene (Evista) is as effective in reducing the chance of developing breast cancer as tamoxifen (Nolvadex) has proven to be.

October 6, 1999—NCI awarded nearly $8 million in grants toward the creation of the Early Detection Research Network, a network to discover and develop new biological tests for the early detection of cancer and of biomarkers for increased cancer risk. The awards created 18 Biomarker Developmental Laboratories to identify, characterize, and refine techniques for finding molecular, genetic, and biologic early warning signals of cancer.

December 8, 1999—The National Cancer Institute published the new *Atlas of Cancer Mortality, 1950-94*, showing the geographic patterns of cancer death rates in over 3,000 counties across the country over more than 4 decades. This atlas updated the first atlas, published in 1975. The 254 color-coded maps in the atlas made it easy for researchers and state health departments to identify places where high or low rates occur. For the first time, maps were presented for both white and black populations. An interactive version of the data was made available on the Internet for the first time, as well.

April 6, 2000—A $60 million program was announced to address the unequal burden of cancer within certain special populations in the United States over the next 5 years. The Special Populations Networks for Cancer Awareness Research and Training were intended to build relationships between large research institutions and community-based programs. Eighteen grants at 17 institutions were expected to create or implement cancer control, prevention, research, and training programs in minority and underserved populations. The cooperative relationships established by the Networks fostered cancer awareness activities, supported minority enrollment in clinical trials, and encouraged and promoted the development of minority junior biomedical researchers.

June 7, 2000—President Clinton issued an executive memorandum directing the Medicare program to reimburse providers for the cost of routine patient care in clinical trials. The memorandum also provides for additional actions to promote the participation of Medicare beneficiaries in clinical studies.

December 3, 2000—NCI established the Center to Reduce Cancer Health Disparities. The Center absorbed the former Office of Special Populations Research. The NCI Strategic Plan to Reduce Health Disparities is part of a major national commitment to identify and address the underlying causes of disease and disability in racial and ethnic communities. Because these communities carry an unequal burden of cancer-related health disparities, NCI is working to enhance its research, education, and training programs that focus on populations in need.

January 12, 2001—NCI announced the creation of the Center for Cancer Research, merging 2 intramural divisions at NCI—the Division of Basic Sciences and the Division of Clinical Sciences—to provide greater opportunities to translate fundamental research into pioneering clinical research and molecular medicine.

May 10, 2001—The Food and Drug Administration announced its approval of the drug Gleevec, also known as STI571, as an oral treatment for chronic myelogenous leukemia (CML). This marked the approval of the first molecularly targeted drug that directly turns off the signal of a protein known to cause a cancer. Clinical trials are continuing to expand as clinical investigators test Gleevec in a variety of cancers that share common molecular abnormalities.

July 24, 2001—The largest-ever prostate cancer prevention study was launched by the NCI and a network of researchers known as the Southwest Oncology Group (SWOG). The Selenium and Vitamin E Cancer Prevention Trial, or SELECT, was designed to determine if these 2 dietary supplements can protect against prostate cancer, the most common form of cancer, after skin cancer, in men. The study was expected to include a total of 32,400 men.

September 4, 2001—NCI and the American College of Radiology Imaging Network (ACRIN) launched the first large, multicenter study to compare digital mammography to standard mammography for the detection of breast cancer.

September 10, 2001—NCI launched the Consumer Advocates in Research and Related Activities (CARRA) program—a landmark initiative convening a large network of dedicated advocates who bring the viewpoint of those affected by cancer to NCI. NCI staff, including researchers and scientists, are able to rely on the CARRA network of more than 200 advocates to give insight and feedback from the consumer's perspective to their developing programs.

February 7, 2002—Scientists from NCI and FDA reported that patterns of proteins found in patients' serum may reflect the presence of ovarian cancer, even at early stages. Currently, more than 80% of ovarian cancer patients are diagnosed at a late clinical stage and have a 20% or less chance of survival at 5 years. This new diagnostic concept is potentially applicable to the diagnosis of other diseases.

May 19, 2002—Researchers from NCI reported that the molecularly targeted drug bevacizumab slowed tumor growth in patients with metastatic renal cell carcinoma, the most common form of kidney cancer in adults.

June 19, 2002—NCI scientists used microarray technology to determine the patterns of genes that are active in tumor cells from which they were able to predict whether patients with the most common form of non-Hodgkin's lymphoma in adults are likely to be cured by chemotherapy. Trials designed to correlate clinical results with molecular data will allow researchers to identify drugs that are effective in subgroups of cancer patients, an approach that has already proven effective in finding new agents to treat breast cancer and leukemia.

July 16, 2002—An NCI-funded trial showed that postmenopausal women who used estrogen replacement therapy for 10 or more years were at significantly higher risk of developing ovarian cancer than women who never used hormone replacement therapy. The relative risk for 10 to 19 years of use was 80% higher risk than non-users, and increased to a 220% higher risk than non-users for women who took estrogen for 20 or more years.

September 18, 2002—NCI launched the National Lung Screening Trial to compare 2 ways of testing for early lung cancer in current and former heavy smokers: spiral computed tomography and single-view chest x-ray. Both spiral CT scans and chest x-rays have been used in clinical practice to detect lung cancer in asymptomatic individuals, but scientific evidence is inconclusive as to whether screening for lung cancer with either method will reduce lung cancer mortality. The trial will examine the relative risks and benefits of both tests in 50,000 current and former smokers at 30 study sites throughout the United States.

September 19, 2002—A new approach to cancer treatment that replaces a patient's immune system with cancer-fighting cells can lead to tumor shrinkage. NCI researchers demonstrated that immune cells, activated in the laboratory against patients' tumors and then administered to those patients, could attack cancer cells in the body. The experimental technique, known as adoptive transfer, has shown promising results in patients with metastatic melanoma who have not responded to standard treatment.

October 16, 2002—Patterns of proteins found in patients' blood may help distinguish between prostate cancer and benign conditions, according to scientists from NCI and FDA. The technique, which relies on a simple test using a drop of blood, may be useful in deciding whether to perform a biopsy in men with elevated levels of prostate specific antigen (PSA).

October 31, 2002—NCI researchers have discovered that a molecule best known for its antimicrobial properties also has the ability to activate key cells in the immune response. This newly discovered function suggests the molecule, a peptide called ß-defensin 2, may be useful in the development of more effective cancer vaccines.

December 12, 2002—A new clinical trial has shown that reducing the interval between successive doses of a commonly used chemotherapy regimen improves survival in women whose breast cancer has spread to the lymph nodes. While previous research has evaluated the use of various forms of "dose dense" chemotherapy, this is the first major controlled study to show a clear survival benefit for women with node-positive breast cancer.

2003—A novel approach to treatment of solid cancers involves therapeutic agents that inhibit the generation of new blood vessels in growing tumors (angiogenesis). The evidence linking tumor growth and metastases with angiogenesis is compelling: in colorectal and breast cancers, the density of microvessels in histologic specimens has been correlated with disease recurrence, metastases, and survival. Of the identified angiogenic factors, vascular endothelial growth factor has been shown to be the most potent and specific.

March 5, 2003—Taking daily aspirin for as little as 3 years was shown to reduce the development of colorectal polyps by 19% to 35% in people at high risk for colorectal cancer in 2 randomized, controlled NCI clinical trials published in the *New England Journal of Medicine*.

April 24, 2003—NCI, CDC, AHRQ, and SAMHSA, in collaboration with the American Cancer Society, launched the Cancer Control PLANET (Plan, Link, Act, Network with Evidence-based Tools), a web portal providing access to regularly updated cancer surveillance data and program resources including cancer control interventions. PLANET is designed to also help state- and community-based planners, program staff, and researchers develop, implement, and evaluate evidence-based cancer control programs. The portal is accompanied by in-person technical support meetings with state and regional public and private sector partnership staff who are working together to use PLANET resources for comprehensive cancer control. (Visit http://cancercontrolplanet.cancer.gov/ for more information.)

May 30, 2003—Under an agreement between FDA and NCI, the 2 agencies, overseen by an Interagency Oncology Task Force, will share knowledge and resources to facilitate the development of new cancer drugs and speed their delivery to patients.

June 24, 2003—Results of the Prostate Cancer Prevention Trial, testing the effectiveness of finasteride to prevent the disease, were announced about a year earlier

than expected. Men taking finasteride had 25% fewer prostate cancer diagnoses than men on the placebo, proving that prostate cancer can be prevented. There was a note of caution, however; the men who did develop prostate cancer while taking finasteride were more likely to have high-grade tumors.

July 1, 2003—Data from the Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial gave fresh insight into the appropriate screening intervals for colorectal cancer after a negative exam. This was the largest study to date of repeat sigmoidoscopy screening after an exam. In 2003 the accepted interval for sigmoidoscopy, a technique in which the rectum and lower colon are examined with a lighted instrument called a sigmoidoscope, was 5 years after a negative exam. This recommendation was based primarily on indirect evidence. Exactly how often to repeat sigmoidoscopy is an evolving field of research. It was unclear whether data from this study, which measured the incidence of growths or polyps 3 years after an initial exam, might play a role in changing the recommended 5-year interval.

September 2, 2003—Death rates from the 4 most common cancers—lung, breast, prostate, and colorectal—continued to decline in the late 1990s according to data from the "Annual Report to the Nation on the Status of Cancer, 1975-2000."

October 9, 2003—A Canadian-led international clinical trial found that post-menopausal survivors of early-stage breast cancer who took the drug letrozole after completing an initial 5 years of tamoxifen therapy had a significantly reduced risk of cancer recurrence compared to women taking a placebo. The clinical trial had been halted early because of the positive results.

November 6, 2003—NCI scientists demonstrated that the growth factors interleukin-2 (IL-2) and IL-15 have contrasting roles in the life and death of lymphocytes, an observation that has implications for the immunotherapy of cancer and autoimmune diseases.

June 3, 2004—NCI's Annual Report to the Nation found cancer incidence and death rates on the decline as survival rates showed significant improvement. Overall, cancer death rates for all racial and ethnic populations combined declined by 1.1% per year from 1993 to 2001 and also declined for many of the top 15 cancers in both men and women. Lung cancer death rates among women leveled off for the first time between 1995 and 2001 after increasing continuously for many decades.

July 16, 2004—An NCI Phase I clinical trial is underway to test the safety and efficacy of BMS-354825 in chronic myeloid leukemia patients with imatinib resistance. The effectiveness of imatinib (Gleevec), a small-molecule drug that inhibits the aberrant activity of the BCR-ABL protein tyrosine kinase, has been limited due to the problem of drug resistance. BMS-354825, a closely related drug, overcomes much of this resistance.

September 13, 2004—NCI announced the Alliance for Nanotechnology in Cancer, a 5-year initiative to integrate nanotechnology development into basic and applied cancer research to facilitate the rapid application of this science to the clinic. The initiative was designed to support the development of nanomaterials and nanoscale devices for molecular imaging and early detection, reporters of efficacy, and multifunctional therapeutics to combat the cancer process.

November 18, 2004—Scientists at NCI have created a model that predicts the survival of 191 follicular lymphoma patients based on the molecular characteristics of their tumors at diagnosis. The model is based on 2 sets of genes—called survival-associated signatures. Understanding the molecular causes of such differences in survival could provide a more accurate method to determine patient risk, which could be used to guide treatment and may suggest new therapeutic approaches.

December 10, 2004—An NCI study determined that a new molecular test can predict the risk of breast cancer recurrence and may identify women who will benefit most from chemotherapy. The test is based on levels of expression (increased or decreased) of a panel of cancer-related genes that is used to predict whether estrogen-dependent breast cancer will come back.

February 16, 2005—In preparation for the new generation of molecular-based oncology medical products, NCI and FDA established an NCI-FDA Research and Regulatory Review Fellowship program. The program is designed to train a cadre of researchers to bridge the processes from scientific discovery through clinical development and regulatory review of new oncology products. The new generation of targeted therapies and diagnostic products will demand new skills and processes that must be incorporated into the current research and regulatory system. The NCI-FDA fellowship program represents an innovative and collaborative approach to that objective. The NCI-FDA Research and Regulatory Fellowship program is an initiative of NCI's and FDA's Interagency Oncology Task Force (IOTF), a major collaboration between the 2 agencies. The IOTF was established in recognition of the fact that cross-fertilization between the NCI and FDA is critical for developing the knowledge base necessary to bring new, molecular-based therapies and diagnostics into the clinical practice of oncology.
http://iotftraining.nci.nih.gov or http://www.cancer.gov/newscenter

April 12, 2005—NCI announced the creation of the cancer Biomedical Informatics Grid™. The program brings together open source, open access tools, applications, data and standards developed by the caBIG™ community to accelerate cancer research, prevention and care. caBIG™ providies the foundational infrastructure and specific applications to create a World Wide Web of cancer research. Over 800 individuals from NCI-designated Cancer Centers and other organizations (more than 80 organizations in all) are participating. https://cabig.nci.nih.gov

April 25, 2005—The combination of the targeted agent trastuzumab (Herceptin) and standard chemotherapy cuts the risk of HER-2-positive breast cancer recurrence by more than half compared with chemotherapy alone. The result comes from two large, NCI-sponsored, randomized trials testing, as adjuvant therapy, a trastuzumab/chemotherapy combination against chemotherapy alone in women with invasive, early stage, HER-2 positive breast cancer. For women with this type of aggressive breast cancer, the addition of trastuzumab to chemotherapy appears to virtually reverse prognosis from unfavorable to good.

May 6, 2005—NCI announced the Community Networks Program (CNP), a 5-year initiative to reduce cancer disparities in minority and underserved populations through community participation in education, research and training. Building upon the work of the previous Special Populations Networks, the CNP aims to improve access to- and utilization of- beneficial cancer interventions and treatments in communities experiencing cancer health disparities. For more information, see http://crchd.nci.nih.gov

September/October 2005—NCI implemented major components of its $144.3 million 5-year initiative for nanotechnology in cancer research. First-year awards totaling $26.3 million were expected to help establish 7 Centers of Cancer Nanotechnology Excellence (CCNEs). Each of the CCNE awardees is associated with 1 or more NCI-designated cancer centers, affiliated with schools of engineering and physical sciences, and partnered with not-for-profit organizations and/or private sector firms, with the specific intent of advancing the technologies being developed. In addition NCI funded awards totaling $35 million over five years to establish

12 Cancer Nanotechnology Platform Partnerships. The National Cancer Institute and the National Science Foundation launched a collaboration to establish integrative training environments for U.S. science and engineering doctoral students to focus on interdisciplinary nanoscience and technology research with applications to cancer. Through this partnership, $12.8 million in grants are being awarded to four institutions over the next 5 years. These advances are part of the NCI Alliance for Nanotechnology in Cancer, launched in September 2004 as a comprehensive, integrated initiative to develop and translate cancer-related nanotechnology research into clinical practice. http://nano.cancer.gov

September 16, 2005—Preliminary results from a large, clinical trial of digital vs. film mammography showed no difference in detecting breast cancer for the general population of women in the trial. However, those women with dense breasts, who are pre- or perimenopausal (women who had a last menstrual period within 12 months of their mammograms), or who are younger than age 50 may benefit from having a digital rather than a film mammogram. These results may give clinicians better guidance and greater choice in deciding which women might benefit most from various forms of mammography.

September 28, 2005—NCI and the National Institute of Neurological Disorders and Stroke (NINDS) created Rembrandt (Repository for Molecular BRAin Neoplasia DaTa), a joint informatics initiative to molecularly characterize a large number of primary brain tumors and to correlate those data with extensive retrospective and prospective clinical data. Understanding the biology behind these tumors and overlaying this valuable data on clinical data will provide clues to discover new therapies. http://rembrandt.nci.nih.gov/

October 5, 2005—NCI' *Annual Report to the Nation on the Status of Cancer, 1975-2002,* showed observed cancer death rates from all cancers combined dropped 1.1% per year from 1993 to 2002. According to the report's authors, declines in death rates reflect progress in prevention, early detection, and treatment.

October 11, 2005—NCI announced the Transdisciplinary Research on Energetics and Cancer (TREC) initiative to study the effects of diet, weight, and physical activity on cancer and to answer critical questions to help guide our nation's public health efforts. The TREC initiative was one of many NIH-funded programs designed to understand and reduce the increasing prevalence of overweight and obesity in the United States.

October 2005—The Patient Navigator Research Program (PNRP), an NCI initiative, was underway to assess the impact of patient navigators on providing timely and quality standard cancer care to patients following an abnormal cancer finding. The PNRP was designed to encourage research collaborations and partnerships with organizations serving diverse underserved communities within cancer care delivery systems. http://crchd.nci.nih.gov

November 7, 2005—NCI launched a cancer biorepository pilot project designed to standardize biospecimen collection and management among investigators of the NCI's prostate cancer Specialized Programs of Research Excellence. The project was expected to enhance the quality and availability of various biospecimens and associated data for the broader scientific community. This year, NCI established the Office of Biorepositories and Biospecimen Research (OBBR) in recognition of the critical role of biospecimens to an understanding of disease at the molecular level, and the OBBR has issues its First Generation Guidelines for NCI-Supported Biorepositories. http://biospecimens.cancer.gov

December 7, 2005—Results from several studies presented at the San Antonio Breast Cancer Symposium validated that a new test can predict the risk of breast cancer recurrence in a sizable group of patients. The studies also appeared to identify which of those patients might benefit most from chemotherapy. The studies were heralded by researchers as an important moment in the move toward individualized cancer care. Central to the investigations was a test, Oncotype DX, that analyzed the expression of a 21-gene panel in biopsy samples from women with estrogen-dependent, lymph-node negative breast cancer, which accounts for more than 50,000 breast cancer cases in the United States each year.

December 13, 2005—NCI and the National Human Genome Research Institute (NHGRI) launched a comprehensive effort to accelerate an understanding of the molecular basis of cancer through the application of genome analysis technologies, especially large-scale genome sequencing. The overall effort, called The Cancer Genome Atlas (TCGA), began with a pilot project to determine the feasibility of a full-scale effort to systematically explore the universe of genomic changes involved in all types of human cancer. NCI and NHGRI each committed $50 million over 3 years to the TCGA Pilot Project. The project was expected to develop and test the complex science and technology framework needed to systematically identify and characterize the genetic mutations and other genomic changes associated with cancer. http://cancergenome.nih.gov

January 12, 2006—NCI Supports Interagency Oncology Task Force Efforts to Stimulate Faster and Safer Development of New, Life-saving Interventions for Cancer Patients—Today's announcement by the FDA of guidance for exploratory investigational new drug (IND) studies will help streamline the earliest phases of clinical research in the development of life-saving medical interventions for cancer patients.

April 17, 2006—Osteoporosis Drug Raloxifene Shown to be as Effective as Tamoxifen in Preventing Invasive Breast Cancer—Initial results of the Study of Tamoxifen and Raloxifene, or STAR, show that the drug raloxifene, currently used to prevent and treat osteoporosis in postmenopausal women, works as well as tamoxifen in reducing breast cancer risk for postmenopausal women at increased risk of the disease. Questions and Answers, STAR en Español

May 23, 2006—Personalized Treatment Trial for Breast Cancer Launched—The **T**rial **A**ssigning **I**ndividua**L**ized **O**ptions for Treatment (**Rx**), or TAILORx, was launched on May 23, 2006, to examine whether genes that are frequently associated with risk of recurrence for women with early-stage breast cancer can be used to assign patients to the most appropriate and effective treatment. Questions and Answers, TAILORx en Español

June 7, 2006—Gene Expression Profiling Can Accurately Diagnose Burkitt's Lymphoma—Gene profiling, a molecular technique that examines many genes simultaneously, can accurately distinguish between two types of immune cell tumors, Burkitt's lymphoma and diffuse large B-cell lymphoma (DLBCL). Burkitt's lymphoma and DLBCL appear similar when viewed under a microscope but correct diagnosis is critical because each requires very different treatments.

June 8, 2006—Statement from NCI on FDA Approval of the HPV Vaccine—Nearly 2 decades ago, researchers at NCI and other institutions began searching for the underlying causes of cervical cancer. That scientific quest led to today's FDA approval of the vaccine Gardasil, which protects against infection from the 2 types of human papillomavirus (HPV) that cause the majority of cervical cancers worldwide. HPV en Español

June 29, 2006—Scientists Identify an Inherited Gene That Strongly Affects Risk for the Most Common Form of Melanoma—Researchers at NCI have identified a link

between inherited and acquired genetic factors that dramatically increase the chance of developing a very common type of melanoma. This finding appeared in an online version of *Science* on June 29, 2006.

August 14, 2006—Researchers Discover a Unique Pattern of Gene Activity that Can Predict Liver Cancer Spread—Researchers have found that a unique pattern of activity for genes in cells located in the tissue surrounding a liver tumor can accurately predict whether the cancer will spread to other parts of the liver or to other parts of the body.

August/September 2006—NCI researchers developed a new model for estimating the 5-year risk of melanoma. The model can be used by health professionals to identify individuals at increased risk of melanoma through routine office visits and help them plan for potential interventions. Also available is the Breast Cancer Risk Assessment Tool, a computer program developed by scientists at NCI and the National Surgical Adjuvant Breast and Bowel Project. This model allows a health professional to estimate a woman's individual breast cancer risk over a 5-year period and over her lifetime and compares her risk calculation with the average risk for a woman of the same age. http://www.cancer.gov/melanomarisktool/; http://www.cancer.gov/bcrisktool/

September 6, 2006—Annual Report to the Nation Finds Cancer Death Rates Continue to Drop; Lower Cancer Rates Observed in U.S. Latino Populations—A new report from the nation's leading cancer organizations found that Americans' risk of dying from cancer continued to drop, maintaining a trend that began in the early 1990s. However, the rate of new cancers remains stable. Questions and Answers

September 27, 2006—NCI Creates Network of Clinical Proteomic Technology Centers for Cancer Research—NCI announced awards totaling $35.5 million over 5 years to establish a collaborative network of 5 Clinical Proteomic Technology Assessment for Cancer Teams.

October 2, 2006—NCI Scientists Identify Novel Protein That Ties Disruption of a Critical Cellular Pathway to Birt-Hogg-Dubé Syndrome—Researchers at NCI have linked specific genetic mutations to defects in cells that lead to a rare disease known as Birt-Hogg-Dubé syndrome. The researchers discovered a novel protein that binds to the normal version, but not the mutant version, of the protein implicated in Birt-Hogg-Dubé syndrome.

October 5, 2006—The Biomarkers Consortium—The Foundation for the National Institutes of Health, NIH, FDA, and the Pharmaceutical Research and Manufacturers of America, a public-private biomedical research partnership, formed The Biomarkers Consortium to search for and validate new biomarkers to accelerate the delivery of new technologies, medicines, and therapies for prevention, early detection, diagnosis, and treatment of disease. The first projects, to be undertaken by NCI, will be 2 clinical trials, one in non-Hodgkin lymphoma and one in lung cancer.

October 16, 2006—NIH Announces 2 Integral Components of The Cancer Genome Atlas Pilot Project—The Cancer Genome Atlas program, created by NCI and the National Human Genome Research Institute (NHGRI), will accelerate understanding of the molecular basis of cancer through the application of genome analysis technologies. NIH today announced another 2 of the components of The Cancer Genome Atlas (TCGA) Pilot Project, a 3-year, $100 million collaboration to test the feasibility of using large-scale genome analysis technologies to identify important genetic changes involved in cancer. Lung, brain (glioblastoma), and ovarian cancers were chosen as the tumors for study by TCGA Pilot Project.

October 18, 2006—NCI Releases Preliminary Data on Genetic Susceptibility for Prostate Cancer—NCI released new data from the Cancer Genetic Markers of Susceptibility (CGEMS) study on prostate cancer. This information could help identify genetic factors that influence the disease and will be integral to the discovery and development of new, targeted therapies. This was the first public release of a whole-genome association study of cancer—such studies examine the entire genome, with no assumptions about which genetic alterations cause cancer.

November 2006—NCI's National Community Cancer Centers Program (NCCCP) Pilot will examine the concept of providing a comprehensive approach to cancer care for all patients in local communities through a pilot initiative scheduled to launch in early 2007. The NCCCP seeks to improve cancer care in local communities by: increasing participation in early phase clinical trials, reducing cancer health disparities, and improving overall access to prevention, screening and treatment services. The pilot program will also explore the value of a computer-based knowledge exchange network that could be used to support the work of the community sites, giving them an effective way to share findings, best practices, and other information to advance the goals and improve the NCCCP model. The pilot program will be conducted at approximately 6 community sites over a period of 3 years.

March 28, 2007—MRI Detects Cancers in the Opposite Breast of Women Newly Diagnosed with Breast Cancer—Magnetic Resonance Imaging (MRI) scans of women who were diagnosed with cancer in one breast detected over 90% of cancers in the other breast that were missed by mammography and clinical breast exam at initial diagnosis, according to a new study. Given the established rates of mammography and clinical breast exams for detecting cancer in the opposite, or contralateral breast, adding an MRI scan to the diagnostic evaluation effectively doubled the number of cancers immediately found in these women.

April 1, 2007—NCI Researchers Discover a Common Variation in a Gene Segment that Increases the Risk for Prostate Cancer—Researchers reported that a variation in a portion of DNA strongly predicts prostate cancer risk and that this common variation may be responsible for up to 20% of prostate cancer cases in white men in the United States. Researchers are scanning the entire human genome to identify common, inherited gene mutations that increase the risks for breast and prostate cancers.

April 18, 2007—Decrease in Breast Cancer Rates Related to Reduction in Use of Hormone Replacement Therapy —The sharp decline in the rate of new breast cancer cases in 2003 may be related to a national decline in the use of hormone replacement therapy (HRT). Age-adjusted breast cancer incidence rates in women in the United States fell 6.7% from 2002 to 2003. Prescriptions for HRT also declined rapidly in 2002 and 2003.

May 8, 2007—Risk of Lymphoma Increases with Hepatitis C Virus Infection—People infected with the hepatitis C virus (HCV) are at an increased risk of developing certain lymphomas (cancers of the lymphatic system). Researchers found that HCV infection increased the risk of developing non-Hodgkin's lymphoma by 20% to 30%. The risk of developing Waldenström's macroglobulinemia (a rare type of non-Hodgkin's lymphoma) went up by 300% and the risk for cryoglobulinemia, a form of blood vessel inflammation, was also elevated for those with HCV infections.

June 14, 2007—NCI Launches a Pilot of its Community Cancer Centers Program to Bring Quality Cancer Care to All—NCI today launched the 3-year pilot phase of a

new program that will help bring state-of-the-art cancer care to patients in community hospitals across the United States. The NCI Community Cancer Centers Program (NCCCP) was designed to encourage the collaboration of private-practice medical, surgical, and radiation oncologist—with close links to NCI research and to the network of 63 NCI-designated Cancer Centers principally based at large research universities.

October 2, 2007—National Cancer Institute Symposium Showcases HIV/AIDS Research and Introduces a New Center of Excellence in HIV/AIDS and Cancer Virology—NCI held a symposium to showcase several important historic achievements in HIV/AIDS research made by former and current NCI scientists, introduce a new Center of Excellence for HIV/AIDS and cancer virology, and discuss new directions in the continuing effort to combat HIV infection, the devastating consequences of AIDS, and AIDS-related cancers.

October 15, 2007—Annual Report to the Nation Finds Cancer Death Rate Decline Doubling—*Special Feature Examines Cancer in American Indians and Alaska Natives*—A new report from the nation's leading cancer organizations showed cancer death rates decreased on average 2.1% per year from 2002 through 2004, nearly twice the annual decrease of 1.1% per year from 1993 through 2002.

November 27, 2007—More Accurate Method of Estimating Invasive Breast Cancer Risk in African American Women Developed—A new model for calculating invasive breast cancer risk, called the CARE model, was found to give better estimates of the number of breast cancers that would develop in African American women 50 to 79 years of age than an earlier model which was based primarily on data from white women.

January 2008—Low-Dose Drug Combination Cuts Risk of Colon Polyp Recurrence—Scientists reported that results of a randomized phase III clinical trial show that a combination of low oral doses of difluoromethylornithine and sulindac greatly reduces the recurrence of colon polyps and is safe and well tolerated.

February 10, 2008—Researchers Discover Common Variations in Gene Segments that Increase the Risk for Prostate Cancer—NCI scientists and their colleagues reported that a set of genetic variations in at least 4 regions of DNA strongly predicts prostate cancer risk and that these variations may be responsible for a large number of prostate cancer cases in white men in the United States.

March 2, 2008—Changes in Adult Stem Cells May Underlie Rare Genetic Disease Associated with Accelerated Aging—Adult stem cells may provide an explanation for the cause of a Hutchinson-Gilford Progeris Syndrome (HGPS), a rare disease that causes premature aging in children.

March 6, 2008—Studying Mutations in Non-Hodgkin Lymphoma Yields Clues for Potential New Therapies—DNA mutations found in a type of non-Hodgkin lymphoma that has a poor prognosis has led researchers to a better understanding of how the cancer develops and how it might be treated.

April 21, 2008—Mouse Studies Identify Gene that May Influence Metastasis Risk in Breast Cancer—Researchers identified a pattern of gene activity in mice that may help to predict individual risk for breast cancer metastasis and survival in humans. A single gene called *bromodomain 4* (*Brd4*) regulates the expression of this pattern, also called a signature. The researchers found that one result of this *Brd4* regulation is the suppression of tumor growth and metastasis in a mouse model of cancer.

May 2008—Chromosome Region Linked to Lung Cancer—In a genome-wide association scan of tag SNPs, researchers identified a susceptibility locus for lung cancer that suggests a direct role for nicotine in the onset and /or growth of lung cancer in people with the SNPs, should these individuals choose to smoke. This information could lead to improved assessment tools for preventive approaches.

June 23, 2008—Blocking a Single Protein Proves Toxic to Myeloma Cells in Laboratory Studies—NCI researchers found that cells from a blood-borne cancer called multiple myeloma rely on the activity of a single protein, IRF4, for the activation of a wide range of genes responsible for cell survival and spread. Blocking the production of this protein can be strikingly effective in eliminating cancer cells in laboratory models of multiple myeloma.

September 4, 2008—The Cancer Genome Atlas Reports First Results of Comprehensive Study of Brain Tumors—This large-scale, comprehensive study examines the most common form of brain cancer, glioblastoma.

September 14, 2008—Study Provides Clues about How Cancer Cells Develop Resistance to Chemotherapy Drug—NCI Researchers and colleagues have shown that increased expression of a gene called SIRT1 in cancer cells plays a significant role in the development of resistance to the chemotherapy drug cisplatin.

January 1, 2009—Gene Abnormality Found To Predict Childhood Leukemia Relapse— Scientists have identified mutations in a gene that predict a high likelihood of relapse in children with acute lymphoblastic leukemia (ALL). Although further research is needed, the findings are likely to provide the basis for future diagnostic tests to assess the risk of treatment failure. By using a molecular test to identify this genetic marker in ALL patients, physicians should be better able to assign patients to appropriate therapies.

February 11, 2009—Researchers Find Abnormal Cells in the Blood Years before Leukemia is Diagnosed—Researchers have shown that abnormal white blood cells can be present in patients' blood more than six years prior to the diagnosis of a chronic form of lymphocytic leukemia. This finding may lead to a better understanding of the cellular changes that characterize the earliest stages of the disease and how it progresses.

March 18, 2009—U.S. Cancer Screening Trial Shows No Early Mortality Benefit from Annual Prostate Cancer Screening—Six annual screenings for prostate cancer led to more diagnoses of the disease, but no fewer prostate cancer deaths, according to a major new report from the Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial, a 17-year project of the NCI. The PLCO was designed to provide answers about the effectiveness of prostate cancer screening.

June 9, 2009—Genetic Variant Associated with Resistance to Chemotherapy Drug in Women with Breast Cancer—Researchers have found links between an individual's genetics and their response to treatment with chemotherapy. The findings, by researchers at the National Cancer Institute (NCI), part of the National Institutes of Health, and colleagues, show how a genetic variation, located in the SOD2 gene, may affect how a person responds to the chemotherapy drug cyclophosphamide. Cyclophosphamide is used in the treatment of breast and other cancers.

August 14, 2009—Cancer Drug Decreases Recurrence of Gastrointestinal Stromal Tumors—Results of a randomized phase III clinical trial show that targeted therapy

with the drug imatinib mesylate(Gleevec) reduces disease recurrence following surgery to remove a localized gastrointestinal stromal tumor. (NOTE: preliminary results were first released in 2007, when the trial was stopped, but they were not published until 2009.)

October 4, 2009—Gene Duplication Identified in an Uncommon Form of Bone Cancer—Scientists have discovered that a familial form of a rare bone cancer called chordoma is explained not by typical types of changes or mutations in the sequence of DNA in a gene, but rather by the presence of a second copy of an entire gene. Inherited large structural changes, known as copy number variations (CNVs), have been implicated in some hereditary diseases but have seldom been reported as the underlying basis for a familial cancer.

October 5, 2009—Gene Mutation Linked to Type of Childhood Cancer—Researchers have identified a gene that may play a role in the growth and spread of a childhood cancer called rhabdomyosarcoma, which develops in the body's soft tissues. The finding has revealed a potential new target for the treatment of this disease.

October 7, 2009—Short Strand of RNA May Help Predict Survival and Response to Treatment for Patients with Liver Cancer—A small RNA molecule, known as a microRNA, may help physicians identify liver cancer patients who, in spite of their poor prognosis, could respond well to treatment with a biological agent called interferon. The finding, by scientists at the National Cancer Institute (NCI), part of the National Institutes of Health, and their partners at Fudan University, Shanghai, and the University of Hong Kong in China and at Ohio State University, Columbus, appeared in the Oct. 8, 2009, issue of The New England Journal of Medicine.

December 18, 2009—Drug for Multiple Myeloma Demonstrated to Significantly Extend Disease-Free Survival—Initial results from a large, randomized clinical trial for patients with multiple myeloma, a cancer of the blood and bone marrow, showed that patients who received the oral drug lenalidomide (Revlimid, also known as CC-5013) following a blood stem cell transplant had their cancer kept in check longer than patients who received a placebo.

January 6, 2010—Gene Mutations Reveal Potential New Targets for Treating a Type of Non-Hodgkin's Lymphoma—Researchers have discovered genetic mutations that may contribute to the development of an aggressive form of non-Hodgkin's lymphoma. These findings provide insight into a mechanism that cancer cells may use to survive, thus identifying potential new targets for treatment of the disease.

January 19, 2010—The Cancer Genome Atlas Identifies Distinct Subtypes of Deadly Brain Cancer That May Lead to New Treatment Strategies—The most common form of malignant brain cancer in adults, glioblastoma multiforme, is not a single disease but appears to be four distinct molecular subtypes, according to a study by the Cancer Genome Atlas (TCGA) Research Network. The researchers of this study also found that response to aggressive chemotherapy and radiation differed by subtype.

April 19, 2010—Long-term Results from Study of Tamoxifen and Raloxifene Shows Lower Toxicities of Raloxifene—Initial results in 2006 of the NCI-sponsored Study of Tamoxifen and Raloxifene (STAR) showed that a common osteoporosis drug, raloxifene, prevented breast cancer to the same degree, but with fewer serious side-effects, than the drug tamoxifen that had been in use many years for breast cancer prevention as well as treatment. The longer-term results show that raloxifene retained 76 percent of the effectiveness of tamoxifen in preventing invasive disease and grew closer to tamoxifen in preventing noninvasive disease, while remaining far less toxic—in particular, there was significantly less endometrial cancer with raloxifene use. Q & A

November 4, 2010—Lung cancer trial results show mortality benefit with low-dose CT:—The NCI has released initial results from a large-scale test of screening methods to reduce deaths from lung cancer by detecting cancers at relatively early stages. The National Lung Screening Trial, a randomized national trial involving more than 53,000 current and former heavy smokers ages 55 to 74, compared the effects of two screening procedures for lung cancer—low-dose helical computed tomography (CT) and standard chest X-ray—on lung cancer mortality and found 20 percent fewer lung cancer deaths among trial participants screened with low-dose helical CT.

November 10, 2010—Researchers discover key mutation in acute myeloid leukemia;—Researchers have discovered mutations in a particular gene that affects the treatment prognosis for some patients with acute myeloid leukemia (AML), an aggressive blood cancer that kills 9,000 Americans annually.

December 23, 2010—NCI announces plans to reinvigorate clinical trials—The National Cancer Institute (NCI) has announced major changes to be made in the long-established Clinical Trials Cooperative Group Program that conducts many of the nationwide trials of new cancer therapies.

March 10, 2011—US cancer survivors grows to nearly 12 million—The number of cancer survivors in the United States increased to 11.7 million in 2007, according to a report released by NCI and CDC. There were 3 million cancer survivors in 1971 and 9.8 million in 2001. En español.

March 31, 2011—Report to Nation finds continued declines in many cancer rates—Rates of death in the United States from all cancers for men and women continued to decline between 2003 and 2007, the most recent reporting period available, according to the latest Annual Report to the Nation on the Status of Cancer. The report also finds that the overall rate of new cancer diagnoses for men and women combined decreased an average of slightly less than 1 percent per year for the same period. Q & A | En español.

May 31, 2011—Origins of XMRV deciphered, undermining claims for a role in human disease—Delineation of the origin of the retrovirus known as XMRV from the genomes of laboratory mice indicates that the virus is unlikely to be responsible for either prostate cancer or chronic fatigue syndrome in humans, as has been widely published. The virus arose because of genetic recombination of two mouse viruses. Q & A | En español.

June 5, 2011—News Note: New chemotherapy scheduling improves survival for most common form of childhood leukemia—New NCI-sponsored clinical trial results reported today at the annual American Society of Clinical Oncology meeting in Chicago show that, in a high-risk form of pediatric acute lymphoblastic leukemia (ALL), a high-dose schedule of a drug raises already high cure rates even higher.

June 29, 2011 (updated from November 4, 2010)—National Lung Screening Trial (NLST) Initial Results: Fast Facts — En español.

June 29, 2011—The Cancer Genome Atlas completes detailed ovarian cancer analysis—An analysis of genomic changes in ovarian cancer has provided the most

comprehensive and integrated view of cancer genes for any cancer type to date. Ovarian serous adenocarcinoma tumors from 500 patients were examined by The Cancer Genome Atlas (TCGA) Research Network. TCGA researchers completed whole-exome sequencing, which examines the protein-coding regions of the genome, on an unprecedented 316 tumors.

September, 8, 2011—NIH study finds two doses of HPV vaccine may be as protective as full course—Two doses of the human papillomavirus (HPV) vaccine Cervarix were as effective as the current standard three-dose regimen after four years of follow-up/NCI-sponsored Costa Rica Vaccine Trial was designed to assess the efficacy of Cervarix in a community-based setting. View Image. | En español.

January 19, 2012—Genetic abnormality predicts benefit from treatment for a rare brain tumor—A clinical trial has shown that addition of chemotherapy to radiation therapy leads to a near doubling of median survival time in patients with a form of brain tumor (oligodendroglioma) that carries a chromosomal abnormality called the 1p19q co-deletion. This abnormality is characterized by the simultaneous deletion of the short arm of chromosome 1 and long arm of chromosome 19. The presence of the chromosomal abnormality was associated with substantially better prognosis and marked improvements in survival in a treatment program of combined chemotherapy and radiation therapy compared to radiation therapy alone. View Image.

March 2, 2012—Heavy exposure to diesel exhaust linked to lung cancer death in miners—In a study of non-metal miners in the United States, federal government scientists reported that heavy exposure to diesel exhaust increased risk of death from lung cancer. The research, all part of the Diesel Exhaust in Miners Study, was designed to evaluate cancer risk from diesel exhaust, particularly as it may relate to lung cancer, among 12,315 workers at eight non-metal mining facilities.Q & A

March 8, 2012—U.S. population data show no increase in brain cancer rates during period of expanding cell phone use—In a new examination of United States cancer incidence data, investigators at the National Cancer Institute (NCI) reported that incidence trends have remained roughly constant for glioma, the main type of brain cancer hypothesized to be related to cell phone use.

May 21, 2012—NIH study finds sigmoidoscopy reduces colorectal cancer rates—Study finds that flexible sigmoidoscopy is effective in reducing the rates of new cases and deaths due to colorectal cancer. Researchers found that overall colorectal cancer mortality was reduced by 26 percent and incidence was reduced by 21 percent as a result of screening with sigmoidoscopy. Q & A | En español.

August 13, 2012—NIH study shows Burkitt lymphoma is molecularly distinct from other lymphomas—Scientists have uncovered a number of molecular signatures in Burkitt lymphoma, including unique genetic alterations that promote cell survival, that are not found in other lymphomas. These findings provide the first genetic evidence that Burkitt lymphoma is a cancer fundamentally distinct from other types of lymphoma.

September 10, 2012—TCGA discovers potential therapeutic targets for lung squamous cell carcinoma—After sequencing the genomes of nearly 200 patients, researchers from The Cancer Genome Atlas initiative have identified potential therapeutic targets in lung squamous cell carcinoma, the second most common form of lung cancer. In the image above, squamous lung cancer subtypes are grouped into four columns. The horizontal rows depict genes identified by TCGA and how they differ by subtype.

September 24, 2012—Study reveals genomic similarities between breast and ovarian cancers—A new study from The Cancer Genome Atlas captured a complete view of genomic alterations in breast cancer and classified them into four intrinsic subtypes, one of which shares many genetic features with high-grade serous ovarian cancer. Depicted are breast cancer cells with the HER2 protein, which can trigger cell growth responses, lit up in bright red.

September 27, 2012—NIH study uncovers likely role of major cancer protein—Scientists may have discovered why a protein called MYC can provoke a variety of cancers. Like many proteins associated with cancer, MYC helps regulate cell growth. A study carried out by researchers at NIH and colleagues found that, unlike many other cell growth regulators, MYC does not turn genes on or off, but instead boosts the expression of genes that are already turned on.

NCI LEGISLATIVE CHRONOLOGY

February 4, 1927—Senator M. M. Neely, of West Virginia, introduced Senate Bill 5589 to authorize a reward for the discovery of a successful cure for cancer, and to create a commission to inquire into and ascertain the success of such cure. The reward was to be $5 million.

March 7, 1928—Senator M. M. Neely introduced Senate Bill 3554 to authorize the National Academy of Sciences to investigate the means and methods for affording Federal aid in discovering a cure for cancer and for other purposes.

April 23, 1929—Senator W. J. Harris, Georgia, introduced Senate Bill 466 to authorize the Public Health Service and the National Academy of Sciences jointly to investigate the means and methods for affording Federal aid in discovering a cure for cancer and for other purposes.

May 29, 1929—Senator W. J. Harris introduced Senate Bill 4531, authorizing a survey in connection with the control of cancer and providing that the Surgeon General of the Public Health Service is authorized and directed to make a general survey in connection with the control of cancer and submit a report thereon to the Congress as soon as practicable, together with his recommendations for necessary Federal legislation.

April 2, 1937—Senator Homer T. Bone of Washington introduced Senate Bill 2067 authorizing the Surgeon General of the Public Health Service to control and prevent the spread of the disease of cancer. It authorizes an annual appropriation of $1 million. Congressman Warren G. Magnuson of Washington introduced an identical bill in the House, House Resolution 6100.

April 29, 1937—Congressman Maury Maverick of Texas introduced House Resolution 6767 to promote research in the cause, prevention, and methods of diagnosis and treatment of cancer, to provide better facilities for the diagnosis and treatment of cancer, to establish a National Cancer Center in the Public Health Service, and for other purposes. It authorizes an appropriation of $2,400,000 for the first year and $1 million annually thereafter. The legal office of the Public Health Service helped draft the bill on the basis of suggestions made by Dr. Dudley Jackson of San Antonio, Tex.

July 8, 1937—A joint hearing of the Senate and House committees was conducted before a subcommittee on cancer research and a revised bill was written. The Interstate and Foreign Commerce submitted Committee Report No. 1281 to accompany the companion bill House Resolution 7931.

August 5, 1937—The National Cancer Institute Act establishes the National Cancer Institute as the federal government's principal agency for conducting research and training on the cause, diagnosis, and treatment of cancer. The bill also calls upon the NCI to assist and promote similar research at other public and private institutions. An appropriation of $700,000 for each fiscal year is authorized. (P.L. 75-244)

March 28, 1938—House Joint Resolution 468, 75th Congress, was passed, "To dedicate the month of April in each year to a voluntary national program for the control of cancer."

July 1, 1944—The Public Health Service Act, P.L. 410, 78th Congress, provided that "The National Cancer Institute shall be a division in the National Institute of Health." The act also revised and consolidated many revisions into a single law. The limit of $700,000 annual appropriation was removed.

August 15, 1950—Public Law 692, 81st Congress, increased the term of office of National Advisory Cancer Council members from 3 to 4 years and the size of the Council from 6 to 12 members, exclusive of the ex-officio members.

December 23, 1971—The National Cancer Act of 1971 provides increased authorities and responsibilities for the NCI Director; initiating a National Cancer Program; establishing a 3-member President's Cancer Panel and a 23-member National Cancer Advisory Board, the latter replacing the National Advisory Cancer Council; authorizing the establishment of 15 new research, training, and demonstration cancer centers; establishing cancer control programs as necessary for cooperation with state and other health agencies in the diagnosis, prevention, and treatment of cancer; and providing for the collection, analysis, and dissemination of all data useful in the diagnosis, prevention, and treatment of cancer, including the establishment of an international cancer data research bank. (P.L. 92-218)

July 23, 1974—The National Cancer Act Amendments of 1974 aim to improve the National Cancer Program and to authorize appropriations for the next three fiscal years. The bill includes provisions for disseminating information on nutrition as related to the therapy or causation of cancer, for trials of cytology test programs for the diagnosis of uterine cancer, and for peer review of grant applications and contract projects. It also establishes a President's Biomedical Research Panel. (P.L. 93-352)

August 1, 1977— The Health Planning and Health Services Research and Statistics Extension Act contains a provision to extend the NCI mandate for one year. (P.L. 95-83).

November 9, 1978—The Community Mental Health Centers Act amends the National Cancer Act to emphasize education and demonstration programs in cancer treatment and prevention, and stipulates that NCI devote more resources to prevention, focusing particularly on environmental, dietary and occupational cancer causes. (P.L. 95-622)

December 17, 1980—The Health Programs Extension Act of 1980 extends the NCI authorization for 3 years. (P.L. 96-538)

November 20, 1985—The Health Research Extension Act of 1985 affirms the special authorities of NCI and emphasizes the importance of information dissemination to the public. (P.L. 99-158)

November 4, 1988—The Health Research Extension Act of 1988 provides a 2-year extension, which reaffirms the special authorities of NCI and added information dissemination mandates, as well as the requirement to assess the incorporation of cancer treatments into clinical practice and the extent to which cancer patients receive such treatments. A representative from the Department of Energy was added to the National Cancer Advisory Board as an ex officio member. (P.L. 100-607)

June 10, 1993—The NIH Revitalization Act of 1993 encourages NCI to expand and intensify its efforts in breast cancer and other women's cancers and authorized increased appropriations. Similar language is included for prostate cancer. NCI is also directed to collaborate with the National Institute of Environmental Health Science (NIEHS), to undertake a case control study to assess biological markers of environmental and other potential risk factors contributing to the incidence of breast cancer in specific counties in the Northeast. In FY 1994, NCI is directed to allocate 7% of its appropriation to cancer control, 9%in FY 1995, and 10%in FY 1996. (P.L. 103-43)

August 13, 1998—The Stamp Out Breast Cancer Act establishes a special alternative rate of postage up to 25% higher than a regular first-class stamp. 70% of the profits from the sale of the stamp, also referred to as a semipostal, would go to the NIH to fund breast cancer research; the remaining 30% would go to the U.S. Department of Defense breast cancer research. (PL 105-41)

July 28, 2000—The Semipostal Authorization Act gives the U.S. Postal Service the authority to issue semipostal stamps, which are sold at a premium in order to help provide funding for a particular area of research. The law also extends the Breast Cancer Stamp Act until July 29, 2002. (P.L. 106-253)

July 10, 2000—The Radiation Exposure Compensation Amendments of 1999 allows more workers who handled radioactive material for weapons programs to be eligible to receive federal compensation for radiation-induced illness. The law expandes previously written compensation acts, making more grades of workers eligible for compensation, and to include compensation for brain, lung, bladder, colon, ovary, and salivary gland cancers. (P.L. 106-245)

November 12, 2001—The Treasury and General Government Appropriations Act of 2002 makes appropriations for the Treasury Department, the U.S. Postal Service, the Executive Office of the President, and certain Independent Agencies, for the fiscal year ending September 30, 2002, and for other purposes. Within this bill is a provision to reauthorize the Breast Cancer Research Postage Stamp through July 29, 2008. (P.L. 107-67)

January 4, 2002—The Best Pharmaceuticals for Children Act is designed to improve the safety and efficacy of pharmaceuticals for children, by reauthorizing legislation that encourages pediatric drug research by giving drug companies an incentive of 6 months of additional market exclusivity to test their products for use in children. (P.L. 107-109)

May 14, 2002—The Hematologic Cancer Research Investment and Education Act of 2002 directs the NIH Director, through the NCI Director, to conduct and support research on blood cancers. In addition, the CDC is directed to establish and carry out an information and education program. (P.L. 107-172)

September 10, 2002—The Public Health Security and Bioterrorism Preparedness and Response Act contains a provision instructing Federal agencies to stockpile and distribute potassium iodide (KI) to protect the public from thyroid cancer in the event of a radiation emergency. (P.L. 107-188)

June 30, 2005—The Patient Navigator Outreach and Chronic Disease Prevention Act of 2005 amends the Public Health Service Act to authorize a demonstration grant program to provide patient navigator services to reduce barriers and improve health care outcomes. The bill directs the HHS Secretary to require each recipient of a grant under this section to use the grant to recruit, assign, train, and employ patient navigators who have direct knowledge of the communities they serve to facilitate the care of individuals who have cancer or other chronic diseases. The bill also directs the HHS Secretary to coordinate with, and ensure the participation of, the Indian Health Service, NCI, the Office of Rural Health Policy, and such other offices and agencies as deemed appropriate by the Secretary, regarding the design and evaluation of the demonstration programs. (P.L. 109-18)

November 11, 2005—The 2-Year Extension of Postage Stamp for Breast Cancer Research extends the U.S. Postal Service's authority to issue special postage stamps to help provide funding for breast cancer research through December 31, 2007. (P.L. 109-100)

January 12, 2007—The Gynecologic Cancer Education and Awareness Act of 2005, or "Johanna's Law" directs the HHS Secretary to carry out a national campaign to increase the awareness and knowledge of health care providers and women with respect to gynecologic cancers. (P.L. 109-475)

April 20, 2007—The National Breast and Cervical Cancer Early Detection Program Reauthorization Act of 2007 allows states to apply for federal waivers to spend a greater share of funds on hard-to-reach underserved women. This bill authorizes funding up to $275 million by 2012; $201 million is authorized for 2007. (P.L. 110-18)

September 27, 2007—The FDA Amendments Act of 2007 amends the Federal Food, Drug, and Cosmetic Act to reauthorize the collection of prescription drug user fees for FY2008-FY2012. Requires NIH to expand the clinical trial registry (clinicaltrials.gov) and creates a clinical trial results database. (P.L. 110-85)

December 12, 2007—The Breast Cancer Research Stamp Reauthorization Act extends through December 31, 2011, provisions requiring the U.S. Postal Service to issue a special postage stamp which contributes funding to breast cancer research. In addition, it requires the NIH and the U.S. Department of Defense to annually report to Congress and the Government Accountability Office on the use of any such funding, including a description of any significant advances or accomplishments. (P.L. 110-150)

December 31, 2007—The Openness Promotes Effectiveness in our National Government Act of 2007, or the OPEN Government Act of 2007, amends the Freedom of Information Act (FOIA) to revise requirements for federal agency disclosures of information requested under that Act. The aim of this bill is to speed up the FOIA process for public access to government documents. (P.L. 110-175)

May 21, 2008—The Genetic Information Nondiscrimination Act of 2007 prohibits health insurers and employers from requiring genetic testing or from using genetic information in decisions regarding insurance eligibility, coverage or premiums, or hiring, firing, or promotion. On March 5, 2008, the text of this bill, as passed by the House, was included in the Emergency Economic Stabilization Act of 2008. (P.L. 110-233)

May 23, 2008—The Temporary Extension of Programs under the Small Business Act and The Small Business Investment Act of 1958 is intended to temporarily extend the SBIR program authorities of the Small Business Administration through March 20, 2009. The SBIR program authorities were due to expire at the end of 2008. (P.L. 110-235)

July 15, 2008—The Medicare Improvements for Patients and Providers Act extends expiring provisions under the Medicare Program, to improve beneficiary access to preventive and mental health services, to enhance low-income benefit programs, and to maintain access to care in rural areas, including pharmacy access, and for other purposes. This bill prevents a 10.6% cut in payments to physicians treating Medicare patients, freezes current payment rates for 18 months, and provides a 1.1% percent increase in 2009. (P.L. 110-275)

July 29, 2008—The Caroline Pryce Walker Childhood Cancer Act of 2007 amends the Public Health Service Act to advance medical research and treatments into pediatric cancers, ensure patients and families have access to the current treatments and information regarding pediatric cancers, establish a population-based national childhood cancer database, and promote public awareness of pediatric cancers. (P.L. 110-287)

October 8, 2008—The Breast Cancer and Environmental Research Act of 2007 amends the Public Health Service Act to authorize the Director of the NIEHS to make grants for the development and operation of research centers regarding environmental factors that may be related to the etiology of breast cancer. The bill establishes an Interagency Breast Cancer and Environmental Research Coordinating Committee within HHS. (P.L. 110-354)

February 4, 2009—The Children's Health Insurance Program Reauthorization Act of 2009 increases the tax on cigarettes by 62 cents to $1.01 per pack and raise taxes on other tobacco products, in order to offset the cost of the program expansion. (P.L. 113-3)

February 17, 2009—The American Recovery and Reinvestment Act of 2009 provides $10 billion in additional funding for the NIH; of which NCI received $1.3 billion in Recovery Act funds to be distributed during the two-year span of 2009 and 2010. (P.L. 111-5)

March 30, 2009—The Nevada Cancer Institute Expansion Act provides for the conveyance of the Alta-Hualapai Site to the Nevada Cancer Institute, and for other purposes. (P.L.111-11)

June 21, 2009—The Family Smoking Prevention and Tobacco Control Act provides the FDA with the authority to regulate tobacco products and establishes within the FDA, the Center for Tobacco Products to implement this act. The Act also establishes a Tobacco Products Scientific Advisory Committee to provide advice, information and recommendations to the Secretary of HHS. The Act allows the Secretary of HHS to restrict the sale or distribution and the advertising or promotion

of tobacco products, if appropriate for the protection of the public health, and to the full extent permitted by the First Amendment. (P.L. 111-31)

March 23, 2010—The Patient Protection and Affordable Care Act (HR 3590), the health care reform bill, establishes a private non-profit institute called the Patient-Centered Outcomes Research Institute to conduct comparative clinical effectiveness research, obtain and use data from the Federal government, and establish advisory panels to advise on research priorities, among other provisions. The bill requires NIH to conduct research to develop and validate new screening tests for breast cancer. The bill also requires the NIH Director to establish a Cures Acceleration Network (CAN) program, which shall award grants and contracts to eligible entities to accelerate the development of high need cures and therapies, including the development of medical products, drugs or devices, or biological products. (P.L. 111-148)

March 31, 2010—The Prevent All Cigarette Trafficking Act of 2009 prevents tobacco smuggling, ensures the collection of all tobacco taxes, and includes smokeless tobacco as a regulated substance. The bill amends the federal criminal code to treat cigarettes and smokeless tobacco as nonmailable and prohibit such items from being deposited in or carried through the U.S. mail. (P.L.111-154)

December 23, 2011—The Breast Cancer Research Stamp Reauthorization Act reauthorized the issuance of semipostal stamps for breast cancer research, from which NIH receives seventy percent of the profits and the Department of Defense receives 30 percent for their respective breast cancer research activities. These funds are in addition to annual appropriations received, and are authorized through 2015. (P.L. 112-80)

January 2, 2013—The Recalcitrant Cancer Research Act of 2012 passed as an amendment to the National Defense Authorization Act for Fiscal Year 2013. The legislation calls for NCI to develop a scientific framework for research on two cancers that have a 5-year relative survival rate of less than 20 percent, and are estimated to cause the death of at least 30,000 individuals in the United States per year. Pancreatic cancer and lung cancer meet these criteria. (P.L. 112-239)

NCI DIRECTORS

Name	In Office from	To
Carl Voegtlin	January 13, 1938	July 31, 1943
Roscoe Roy Spencer	August 1, 1943	July 1, 1947
Leonard Andrew Scheele	July 1, 1947	April 6, 1948
John Roderick Heller	May 15, 1948	July 1, 1960
Kenneth Millo Endicott	July 1, 1960	November 10, 1969
Carl Gwin Baker	July 13, 1970	May 5, 1972
Frank Joesph Rauscher, Jr.	May 5, 1972	November 1, 1976
Arthur Canfield Upton	July 29, 1977	December 31, 1980
Vincent T. DeVita, Jr.	July 9, 1980	September 1, 1988
Samuel Broder	December 22, 1988	April 1, 1995
Richard D. Klausner	August 1, 1995	September 30, 2001
Andrew C. von Eschenbach	January 22, 2002	June 10, 2006
John E. Niederhuber	September 15, 2006	July 12, 2010
Harold Varmus	July 12, 2010	Present

NATIONAL CANCER INSTITUTE RESEARCH PROGRAMS

The National Cancer Institute leads the National Cancer Program through its operation of research components that provide support for extramural and intramural cancer-related research and through its outreach and collaborations within the cancer community worldwide.

Cancer research is conducted with NCI funding in nearly every state in the United States and more than 20 foreign countries, in addition to research conducted at its own facilities. NCI supports cancer research training, education, and career development, and provides leadership for setting national priorities in cancer research.

NCI Research Components

- Center for Cancer Research
- Division of Cancer Epidemiology and Genetics
- Division of Cancer Biology
- Division of Cancer Control and Population Sciences
- Division of Cancer Prevention
- Division of Cancer Treatment and Diagnosis
- Division of Extramural Activities
- Center for Cancer Genomics

- Center for Cancer Training
- Center for Global Health
- Center for Strategic Scientific Initiatives
- Center to Reduce Cancer Health Disparities
- Office of HIV and AIDS Malignancy
- SBIR Development Center
- Office of Cancer Centers
- Frederick National Laboratory for Cancer Research

Center for Cancer Research

The Center for Cancer Research (CCR), the basic and clinical arm of NCI's intramural research program, is a distinctive and effective community of scientists who integrate basic research discovery with the development of novel interventions against cancer and HIV/AIDS. CCR has infrastructure built upon collaborative networks, a sophisticated clinical program, a focus upon development of technology and partnerships, and value placed upon training and mentorship.

CCR's leadership promotes a collaborative research environment, which is integral to accelerating progress in basic discovery and clinical research. Focus areas give CCR the flexibility to reassess and respond rapidly to emerging scientific needs, leveraging strengths of experts from diverse fields. Scientific teams are encouraged to pursue high-risk translational research that will have a major impact on health, but may require long-term, continuous support that may be difficult for industry or academia to sustain.

Clinicians in CCR's Clinical Program work closely with basic scientists to translate discoveries in the laboratory into new therapies and to rapidly move them into clinical trials. CCR's unique bench-to-bedside—and back—infrastructure gives CCR flexibility to respond rapidly to emerging scientific opportunities in the pursuit of novel treatments, while assuring each patient receives compassionate, cutting-edge care. Researchers also partner with extramural members of the oncology community to stimulate scientific discovery and to move promising new therapies into broader national trials with the ultimate goal of improving clinical practice.

Technology development is an important goal of CCR. Scientific teams already have produced many new drugs and technologies that are improving the lives of Americans and rapidly advancing research. Most recent examples of new drugs include Gardasil and Cervarix, vaccines against the Human Papilloma Virus (HPV), and Kepivance, a drug used to treat mucositis, a complication of some cancer treatments. Through formal partnerships with public and private organizations, CCR accelerates the movement of scientific breakthroughs to the marketplace.

CCR also places an emphasis on training the next generation of investigators in cancer research. Numerous programs are offered to students at various levels of training. In addition, various career development opportunities are available to staff at any career stage from postdoctoral fellowships including clinical training programs to programs aimed to enhance the professional development of experience researchers. These include formal courses in specific science areas, management, and mentoring. CCR also sponsors events that support career growth and provide opportunities to present scientific findings, network, and enhance research skills. In addition, trainees have ready access to mentors with expertise across CCR including investigators, staff scientists, and staff clinicians.

Additional information about NCI's Center for Cancer Research can be found at http://ccr.cancer.gov

Division of Cancer Epidemiology and Genetics

Through its broad programs in epidemiology, genetics, statistics, and related areas, the Division of Cancer Epidemiology and Genetics (DCEG) carries out population-based and interdisciplinary research both nationally and internationally to discover the genetic and environmental determinants of cancer. DCEG is uniquely positioned to conduct value-added epidemiologic research projects that are high-risk in nature and require (a) long-term commitments of scientific staff and funding support through contracts, (b) a coordinated national programmatic approach, or (c) a rapid response to emerging public health or scientific issues. The Division develops multi-disciplinary infrastructures and resources for use throughout the scientific community, including database management software for genome-wide association studies, biospecimen inventories, family-based studies, a variety of software packages for exposure assessment, and interactive cancer mortality atlases to generate leads into the environmental determinants of cancer. DCEG also has a firm commitment to training the next generation of scientists, and has trainees from the predoctoral to postdoctoral stage. The research conducted by the Division often provides a scientific basis for public health recommendations and policies.

The *Epidemiology and Biostatistics Program* consists of six branches that conduct independent and collaborative epidemiologic and biostatistical investigations to identify the distribution, characteristics, and causes of cancer in human populations. The Program investigates demographic variation in the occurrence of cancer by age, race, gender, geography, and over time. Special emphasis is placed on the carcinogenic effects of occupational and environmental exposures, ionizing and non-ionizing radiation, dietary and nutritional factors, medicinal agents such as hormones, infectious agents, and host factors including genetic susceptibility to cancer-causing exposures. The Program also develops biostatistical methods for family-based and population-based studies on cancer etiology and prevention.

The *Human Genetics Program* provides an expanded focus for interdisciplinary research into the genetic determinants of human cancer. Its branches and laboratory explore and identify heritable factors that predispose to cancer, including studies of gene-environment interactions. Program investigators study cancer-prone families to identify and clone predisposing genes; investigate the prevalence of identified genes in the general population; conduct pharmacogenetic studies to evaluate genetic polymorphisms as determinants of cancer risk and treatment outcomes; and translate advances in molecular genetics into evidence-based management strategies. The Laboratory of Translational Genomics examines validated regions of the genome associated with cancer risk, laying the groundwork for functional studies to determine the causal variants and biological mechanisms involved. These activities are complemented by the NCI Cancer Genomics Research Laboratory, where genome-wide association studies and next generation sequencing are carried out to uncover the heritable components to cancer.

Fellows in the *DCEG Fellowship Program* work with world class scientists to explore the causes of cancer and new approaches to its prevention. Predoctoral and postdoctoral fellows carry out, analyze, and publish population, family, and laboratory-based studies. They gain experience in diverse study designs, novel analytic techniques, and genomics and informatics. Professional skills development and preparation for future careers in epidemiology and related areas are an integral part of the program. For more information and to apply, visit our Web site at: http://dceg.cancer.gov/fellowship-training.

Additional information about DCEG can be found at http://dceg.cancer.gov.

Division of Cancer Biology

The Division of Cancer Biology (DCB) supports an extensive, multidisciplinary extramural research program that investigates the basic, cellular, and molecular mechanisms of cancer and the role of biological, hormonal, chemical, and physical agents in the initiation and promotion of cancer. This basic biological research is crucial to building a foundation for cancer research and supporting emerging research areas and technologies. Six Branches and several innovative NCI programs coordinated by the Division's Office of the Director sustain and promote a diverse portfolio of investigator-initiated research grants from academic institutions and research institutes throughout the country and abroad.

The *Cancer Cell Biology Branch* supports basic research directed at understanding the biological basis for the differences between normal cells and cancer cells, with an emphasis on studies that reveal processes with the potential for therapeutic or preventive intervention. The areas of cancer cell physiology and cancer cell metabolism are also supported by this branch.

The *Cancer Etiology Branch* supports research programs dealing with biological, chemical, and physical agents that are possible etiological factors or co-factors in cancer and with the control of these agents and their associated diseases. Key program areas supported by this Branch include HIV and AIDS-associated malignancies and the role of the microbiome in carcinogenesis.

The *Cancer Immunology and Hematology Branch* supports basic research in tumor immunology and the biology, biochemistry, and molecular biology of the hematologic malignancies (leukemias, lymphomas, and multiple myeloma), including the role of tumor stem cells in the maintenance and progression of these malignancies.

The *DNA and Chromosome Aberrations Branch* supports research that emphasizes cancer genetics, epigenetics, and genomic studies at the DNA and chromosome level, including mechanisms of DNA damage/repair and related molecular, cytogenetic, and chromosomal effects during induction and progression to malignancy.

The *Structural Biology and Molecular Applications Branch (SBMAB)* supports cancer research and discovery in three broad areas: technology development and molecular applications, biophysical biology, and computational/mathematical methods and bioinformatics development. The branch also supports integrated and systems biology approaches to cancer biology.

The *Tumor Biology and Metastasis Branch* supports research that seeks to understand the interactions of cancer cells with the tumor or host microenvironment to delineate the molecular mechanisms and signaling pathways of cancer development and proliferation.

The *NCI-Mouse Models of Human Cancers Consortium (NCI-MMHCC)* promotes effective integration of mouse models and mouse genetics resources into basic and translational cancer research. Included are pre-clinical and co-clinical projects, new strategies for early detection, interventions, and risk assessment, and agnostic discovery of multi-factorial effectors of cancer susceptibility. Information resources are available at http://emice.nci.nih.gov.

The *Integrative Cancer Biology Program (ICBP)* supports twelve “Centers for Cancer Systems Biology (CCSB)” investigating the development and progression of cancer through a systems approach to the study of the disease. An integrative and multi-disciplinary effort among all fields of cancer research is applied to the analysis of cancer as a complex biological system, incorporating a spectrum of new technologies such as genomics, proteomics, and molecular imaging to generate computer and mathematical models that can predict the cancer process. http://icbp.nci.nih.gov/

The *Tumor Microenvironment Network (TMEN)* focuses on expanding our understanding of the role of the tumor microenvironment in cancer initiation, progression, and metastases. Supported research focuses on the mechanisms of tumor-stroma interactions in cancer, the identification of tumor and stromal stem cells and their role in stem cell-stroma interactions, and the role of microenvironment alterations as well as inflammatory and immune cells in tumor development, progression, and metastasis. http://tmen.nci.nih.gov/

The *Barrett's Esophagus Translational Research Network (BETRNet)* is a trans-divisional NCI program that is supported by the Division of Cancer Biology and the Division of Cancer Prevention. The objectives of BETRNet are to improve understanding of esophageal adenocarcinoma (EA) biology, support research associated with EA’s precursor lesion Barrett’s Esophagus, and improve EA risk stratification, prediction, and prevention.

In addition, the Division sponsors several resources for cancer researchers including bioinformatics tools for analyzing data, such as a state-of-the-art X-ray crystallography experimental facility funded through the *GM/CA CAT Project* (http://www.gmca.anl.gov/) , and data and specimen repositories such as The *Chernobyl Tissue bank* (http://www.chernobyltissuebank.com/) and the NCI Mouse Repository (http://mouse.ncifcrf.gov/).

Additional information about NCI's Division of Cancer Biology can be found at http://dcb.nci.nih.gov.

Division of Cancer Control and Population Sciences

The Division of Cancer Control and Population Sciences (DCCPS) strives to understand the causes and distribution of cancer in populations; support the development and implementation of effective interventions; and monitor and explain cancer trends. DCCPS both generates new knowledge and seeks to ensure that the products of cancer control research are effectively applied in all segments of the population.

The *Office of Cancer Survivorship* supports research that explores the long- and short-term physical and psychological effects of cancer and its treatment. The

Office provides a focus within the NIH for the support of research and education aimed at professionals who deal with cancer patients and survivors. In consultation with the medical and consumer communities, the Office articulates and coordinates a research strategy that will result in improvement in the quality of life, and a reduction in morbidity and mortality in cancer survivors.

The *Applied Research Program* evaluates patterns and trends in cancer-associated health behaviors and practices, genetic susceptibilities, outcomes, and services. The Program monitors and evaluates cancer control activities in general and specific populations in the United States and determines the influence of these factors on patterns and trends in cancer incidence, morbidity, mortality, and survival. The Program comprises three branches: Health Services and Economics, Outcomes Research, and Risk Factor Monitoring and Methods.

The *Behavioral Research Program* supports investigations ranging from basic behavioral research to research on the development and dissemination of interventions in areas such as tobacco use, dietary behavior, sun protection, decision making, and counseling about testing for cancer susceptibility and participation in cancer screening. The Program comprises the Basic Biobehavioral and Psychological Sciences Branch, Health Behaviors Research Branch, Health Communication and Informatics Research Branch, Process of Care Research Branch, Science of Research and Technology Branch, and Tobacco Control Research Branch.

The *Epidemiology and Genomics Research Program* supports population-based research to increase our understanding of the etiology and prevention of cancer. Staff manages and fosters a range of etiologic research on genetic, environmental, infectious, hormonal, lifestyle, and pharmacologic factors in cancer etiology. The Program includes the Methods and Technologies Branch, the Modifiable Risk Factors Branch, the Host Susceptibility Factors Branch, and the Clinical and Translational Epidemiology Branch.

The *Surveillance Research Program* supports cancer surveillance and health services research to answer key questions about cancer incidence and mortality in diverse regions and populations of the U.S. The Surveillance, Epidemiology, and End Results (SEER) Program, a major component of the Program, collects cancer data on a routine basis from designated population-based cancer registries in various areas of the country. The Program includes the Data Analysis and Interpretation Branch, Data Modeling Branch, Statistical Methodology and Applications Branch, and Surveillance Systems Branch.

Additional information about NCI's Division of Cancer Control and Population Sciences can be found at http://cancercontrol.cancer.gov.

Division of Cancer Prevention

The Division of Cancer Prevention (DCP) is the primary NCI unit devoted to cancer prevention research. DCP works through 10 research groups that focus on either defined scientific subject areas or specific organ systems.

The *Chemopreventive Agent Development Research Group* focuses on the identification, preclinical development, and qualification of potential cancer preventive agents for phase I clinical studies. Research includes all classes of agents and a wide range of methodologies and technologies. This group also supports clinical trial development, agent acquisition, Investigational New Drug (IND)—directed toxicology and related research; and provides technical support and research resources to extra- and intramural investigators and industry for chemopreventive agent development.

The *Community Oncology and Prevention Trials Research Group* works to improve clinical oncology in community settings via the Community Clinical Oncology Program (CCOP). Local medical facilities known as CCOPs promote interaction between community oncologists and clinical cooperative groups by allowing local physicians to participate in NCI-sponsored treatment, prevention, and symptom management clinical trials. NCI's large-scale prevention trials are coordinated through the CCOP program, which also funds quality of life and palliative care research.

The *Nutritional Science Research Group* generates and tests hypotheses relating diet to the causation and prevention of cancer. It also works to establish a comprehensive understanding of the precise role of bioactive food components in determining cancer risk and tumor behavior. The group seeks to determine how specific genes and/or molecular targets are influenced by either essential or non-essential nutrients, allowing the identification of people who may benefit from a prevention intervention.

The *Cancer Biomarkers Research Group* is the principal resource in the NCI for biomarker information pertaining to cancer detection and risk assessment. This group of scientists supports research for the development and validation of promising early cancer biomarkers for risk prediction and early detection of cancer, including development of databases and informatics systems to track the utility of new biomarkers and new or refined technologies for studying the molecular circuitry of preneoplastic cells. The Early Detection Research Network, a program of translational research to identify early cancer and cancer risk, is managed by this group.

The *Early Detection Research Group* develops scientific information and concepts to aid in the dissemination of knowledge of early detection techniques, practices, and strategies to reduce mortality and morbidity from cancer. This group manages and supports clinical trials for early detection and analyzes research results on screening; fosters technology development and statistical modeling of new technologies; and encourages the publication of scientific findings and adoption of early detection practices. NCI's large-scale early detection trials have been coordinated through this program, including the Prostate, Lung, Colorectal and Ovarian Cancer Screening Trial and the National Lung Screening Trial.

The *Biometry Research Group* plans and conducts independent and cooperative research studies on cancer epidemiology, prevention, screening, and diagnosis using methods of mathematical and analytic statistics. This Group provides consultation and advice on biostatistical methodology, study design, and biometry to investigators inside and outside of NCI.

The 4 organ-specific research groups in DCP are the *Breast and Gynecologic Cancer Research Group*, the *Gastrointestinal and Other Cancers Research Group*, the *Lung and Upper Aerodigestive Cancer Research Group*, and the *Prostate and Urologic Cancer Research Group*. Each group focuses on cancer sites within their defined organ group, overseeing and supporting research in chemoprevention, nutrition, and other prevention strategies that include nutritional, pharmacologic, biologic, and genetic approaches; vaccine development or immunologic intervention; cancer screening and early detection. These groups support clinical trials that lead to new technologies for identifying and modifying premalignant lesions as well as trials that develop agents based on measures of efficacy, such as cancer incidence reduction. Surrogate endpoint biomarkers studies also measure the modulation of the biomarkers as a potential indicator of efficacy.

Additional information about NCI's Division of Cancer Prevention can be found at http://prevention.cancer.gov

Division of Cancer Treatment and Diagnosis

The Division of Cancer Treatment and Diagnosis (DCTD) takes prospective detection and treatment leads, facilitates their paths to clinical application, and expedites the initial and subsequent large-scale testing of new agents and interventions in patients.

DCTD has 8 major programs that work together to bring unique molecules from the laboratory bench to the patient bedside:

The *Cancer Diagnosis Program* stimulates, coordinates, and funds research on diagnostics and improved technologies to better characterize tumors and/or guide treatment decisions, as well as specimen resources, databases related to those specimens, overarching biospecimen-related policies, practices, biospecimen research, and other related issues.

The *Cancer Imaging Program* expands the role of imaging in noninvasive diagnosis, identification of disease subsets in patients, disease staging, image-guided treatment, and treatment monitoring.

The *Cancer Therapy Evaluation Program* functions as NCI's primary clinical evaluator of new anticancer agents, radiation treatments, and surgical methods. The program administers the 11 cooperative research groups that unite researchers around the nation and the world in the pursuit of distinctive and effective new treatments for cancer.

The *Developmental Therapeutics Program* serves as a vital resource in discovering potential cancer therapeutics and acquiring preclinical development information. The program provides research materials and manufactures new agents in bulk quantities for use in investigational new drug (IND)-directed studies.

The *Radiation Research Program* provides expertise to investigators who perform novel radiotherapy research and assists in establishing future radiation research directions.

The *Translational Research Program* supports multi-disciplinary, collaborative, organ-based research aimed at translating laboratory findings to the clinic and determining the biological basis of clinical observations to improve the practice of oncology. This is achieved primarily through the Specialized Programs of Research Excellence (SPORE) grant mechanism.

The *Biometrics Research Branch* provides state-of-the-art statistical and biomathematical analyses for DCTD and other NCI components.

The *Office of Cancer Complementary and Alternative Medicine* aims to increase the amount of high-quality cancer research and information about the use of complementary and alternative modalities.

Additional information about NCI's Division of Cancer Treatment and Diagnosis can be found at http://dctd.cancer.gov/.

Division of Extramural Activities

The Division of Extramural Activities (DEA) is responsible for providing guidance to potential cancer research grant applicants, coordinating and assisting in the development of NCI's extramural funding initiatives, referring applications to appropriate programs, providing scientific peer review and oversight of NCI's extramural research, coordinating advisory committees including the National Cancer Advisory Board and the Board of Scientific Advisors, establishing policies and procedures for extramural research, research integrity, and grant applications, managing extramural staff training and career development, and coding and tracking NCI's research portfolio.

DEA staff members serve as chief NCI liaisons to the extramural cancer research community, processing approximately 12,000 grant applications for referral and recruiting thousands of scientific experts to review about 3,000 grants per year. The DEA's Committee Management Office handles the complex preparation and logistics required for NCI's advisory groups to function productively and for the HHS Secretary's Advisory Committee on Genetics, Health, and Society to act in its prescribed role.

Additional information about NCI's Division of Extramural Activities can be found at http://deainfo.nci.nih.gov.

Center for Cancer Genomics

NCI established the Center for Cancer Genomics (CCG) in 2011 to develop and apply genome science to improve the diagnosis and treatment of cancer patients. The CCG promotes collaborations of national and international agencies, academic researchers, and community physicians to foster research based on genomes, gene expression, proteomics, and other technologies to usher in a modern era of integrated and individualized prevention, diagnosis, and treatment of cancer, all whilst ensuring responsible use of genetic information. Through research on the structure and function of the molecular make-up of human tumor cells and the human genome, researchers funded by CCG have identified many genes involved in cancer that are informing knowledge of biologic function, drug development, and DNA-based diagnostics. CCG initiatives include:

The *Cancer Genome Atlas (TCGA)*, which is a joint initiative of NCI and the National Human Genome Research Institute (NHGRI). TCGA is currently collecting and analyzing thousands of samples—as many as several hundred for each of more than 20 different cancers—to identify genetic and epigenetic features that drive the initiation and progression of cancer. The data are made available to qualified researchers (http://cancergenome.nih.gov);

Cancer Target Discovery and Development (CTD²) Network, which aims to identify and characterize potential targets for cancer therapy as well as diagnostic, prognostic, and drug response markers (http://ocg.cancer.gov/programs/ctdd.asp); and

Therapeutically Applicable Research to Generate Effective Treatments (TARGET), which aims to identify genetic markers in childhood cancers that can accelerate the development of new therapies, as well as distinguish at the time of diagnosis which patients may respond to either standard treatment or novel targeted therapies (http://target.cancer.gov).

Center for Cancer Training

NCI's Center for Cancer Training, established in July 2008, is committed to catalyzing the development of a 21st century workforce capable of advancing cancer research through a scientifically integrated approach. This is accomplished by:

- Coordinating and providing research training and career development activities for fellows and trainees at NCI's laboratories, clinics, and other research groups
- Developing, coordinating, and implementing opportunities for support of cancer research training, career development, and education at institutions nationwide
- Identifying workforce needs in cancer research and adapting NCI's training and career development programs and funding opportunities to address these needs.

The Center for Cancer Training comprises 3 intramural training programs—NCI's Center for Cancer Research Office of Training and Education, NCI's Division of Cancer Epidemiology and Genetics Fellowship Office, and NCI's Cancer Prevention Fellowship Program—and NCI's extramural Cancer Training Branch.

Additional information is available at http://www.cancer.gov/cct.

Office of Cancer Genomics—The Office of Cancer Genomics (OCG) continues a history of informing and enabling an in-depth understanding of the molecular mechanisms of cancer through the support of innovative programs to produce needed data and tools in the area of genomics. The ultimate goal of all of these over-arching initiatives is to advance the areas of prevention, early detection, diagnosis, and treatment of cancer. OCG provides a focus for scientific programs in genomics that are designed to build an interface between genomic and applied cancer research through the establishment of accessible research tools including clones, databases and informatics.

Office of Cancer Clinical Proteomics Research—The Office of Cancer Clinical Proteomics Research (OCPR) accelerates the use of proteomic-based technologies in cancer research through its technology-driven initiatives, collaborations with other government programs, and engagement with the private sector. OCCPR also facilitates the building of an integrated foundation of proteomic technologies, data, reagents and reference materials, and analysis systems to systematically advance the application of protein science to accelerate discovery and translation of biomarkers in clinical cancer research. The Office develops and manages extramural sciences programs, including the NCI Clinical Proteomic Technologies for Cancer and collaborates with both intramural research programs and other agencies.

Office of Cancer Nanotechnology Research—The Office of Cancer Nanotechnology Research develops strategies, and implements and manages extramural science and technology programs, including the NCI Alliance for Nanotechnology in Cancer initiative, to leverage the use of nanotechnologies in fundamental studies of cancer biology, early diagnostics and imaging of the disease, and improvement of cancer treatment and care. It also promotes standardization and translation of the developed technologies to the clinic through collaborations with NCI programs, both extramural and intramural, as well as through joint efforts with regulatory agencies (U.S. Food and Drug Administration/National Institute of Standards and Technology), including the Nanotechnology Characterization Laboratory.

Office of Physical Sciences-Oncology—The Office of Physical Sciences-Oncology provides a needed interconnection to facilitate the translation and incorporation of physical sciences approaches to cancer research across the NCI, NIH, and interagency activities. One of the first initiatives being pursued is the establishment of a network of physical sciences-oncology centers. These centers will enable the convergence of physics, chemistry, mathematics and engineering with existing disciplines in cancer research by building trans-disciplinary teams and infrastructure to generate new knowledge and paradigm-shifting science. The ultimate goal of these centers and the branch is to catalyze new fields of study in basic and clinical cancer research by utilizing physical sciences/engineering principles to enable a better understanding of the disease at all length scales, which may lead to exponential progress against the way we treat and diagnose cancer.

The Cancer Genome Atlas (TCGA) Program Office—The TCGA Program Office serves as the primary office for the management of the TCGA Program, a highly visible, national collaborative initiative between the NCI and the National Human Genome Research Institute (NHGRI) to chart the complex pathways involved in more than 20 cancers. The Office provides oversight of of the TCGA pipeline including data generation; tissue accrual; biospecimens collection, quality and distribution; informatics through management of several data generation cooperative agreements; NCI-funded contracts for dedicated TCGA biospecimens procurement; data coordination contracts; and data analysis cooperative agreements. The TCGA Program Office also supports the development and dissemination of genomics information, technology, methods, informatics tools, and reagents to serve the needs of the cancer research community.

Center for Global Health

Established in 2011, the Center for Global Health (CGH) serves as the focal point for all global health activities within NCI. The CGH leads the development of global cancer research priorities; provides strategic vision to the global cancer community and pursues strategies directed towards control of cancer on a global scale; conducts and supports international cancer research, training, health information dissemination, and other relevant biomedical research programs; and coordinates collaborations and partnerships with other agencies and organizations engaged in efforts to improve global health.

Center for Strategic Scientific Initiatives

The NCI Center for Strategic Scientific Initiatives (CSSI) focuses on emerging scientific discoveries and innovative technologies that uniquely impact the full spectrum of cancer research and clinical control. The Center is tasked with planning, developing, executing, and implementing rapid strategic scientific and technology initiatives that keep the Institute ahead of the scientific curve with respect to potential new areas and discoveries. CSSI leverages the full flexibility of available federal mechanisms for the development and application of advanced technologies, synergy of large scale and individual initiated research, and/or forging novel

partnerships that emphasize innovation, trans-disciplinary teams and convergence of scientific disciplines. With an emphasis on complementing the scientific efforts of the Institute's standing Divisions, the Center's efforts seek to enable the translation of discoveries into new interventions, both domestically and in the international arena, to prevent, detect, diagnose and treat cancer more effectively.

The offices within CSSI are focused on foundational technology-based areas such as the intersection of physical sciences and oncology, proteomics and nanotechnology. The programs in these offices build databases, knowledge, tools and extramural trans-disciplinary scientific teams to promote the themes of the Center.

The *Center for Strategic Scientific Initiatives Office of the Director* (CSSI OD) is responsible for providing oversight and coordination of scientific and programmatic activities for its offices and their programs in order to effectively carry out the mission of CSSI. This includes facilitating extensive reviews and approvals from the NCI Scientific Program Leaders, the NCI Board of Scientific Advisors, and the National Cancer Advisory Board. CSSI OD also oversees programmatic management of two grant programs, the NCI's Provocative Questions (PQ) Initiative and the Innovative Molecular Analysis Technologies (IMAT) Program. The objective of the PQ Initiative is to stimulate specific areas of cancer research that have been deemed understudied, neglected, paradoxical, or difficult to address in the past. The mission of the IMAT program is to support the development, maturation, and dissemination of novel and potentially transformative next-generation technologies through an approach of balanced but targeted innovation in support of clinical, laboratory, or epidemiological research on cancer. Both of these programs function as trans-divisional, highly collaborative efforts that span multiple disciplines in cancer research to most effectively achieve their goals.

The *Office of Cancer Clinical Proteomics Research* (OCCPR) facilitates the building of an integrated foundation of proteomic technologies, open-data policy, reagents and reference materials, and analysis systems to systematically advance our understanding of cancer biology. The Office manages extramural science programs, including the Clinical Proteomic Tumor Analysis Consortium (CPTAC), and builds partnerships with public-private sectors to further the application of protein science. CPTAC represents a network of Proteome Characterization Centers, which coordinate research approaches and data sharing efforts in order to comprehensively interrogate the protein component of genomically characterized cancer biospecimens, linking cancer genome to cancer phenotype via the understanding of cancer proteome. While genes are the "recipes" of the cell containing all of the instructions for making molecules called proteins and helping with their assembly, proteins and their modifications by other cellular components, the products of these recipes by tightly controlled mechanisms of transcription and translation, serve as the "engines" to carry out cellular functions and drive both normal and disease physiology.

The *Office of Cancer Nanotechnology Research* (OCNR) develops strategies to leverage advances in nanotechnology for applications in basic and clinical cancer research. Office activities include support and management of extramural science and technology programs, such as the NCI Alliance for Nanotechnology in Cancer initiative, and coordinating efforts to further clinical development of nanotechnology. These efforts include TONIC (Translation of Nanotechnology in Cancer), a consortium of pharmaceutical companies, biotechnology firms and academic researchers, and the Nanotechnology Characterization Laboratory (NCL). NCL develops and promotes standards and protocols for the characterization of nanomaterials intended for clinical use, in collaboration with U.S. Food and Drug Administration and the National Institute of Standards and Technology.

The Office of Physical Sciences—Oncology (OPSO) provides a needed interconnection to facilitate the convergence of physical sciences and cancer research perspectives across the NCI, NIH, and through interagency activities. The NCI Physical Sciences – Oncology Centers (PS-OC) Program, launched in 2009, consists of a Network of 12 Centers nationwide. These centers will enable the integration of physics, chemistry, mathematics and engineering with existing disciplines in cancer research by building transdisciplinary teams and infrastructure to generate new knowledge and paradigm-shifting science. The ultimate goal of these centers and the office is to catalyze new fields of study in basic and clinical cancer research by utilizing physical sciences/engineering principles to enable a better understanding of the disease at all length scales, which may lead to exponential progress against the way we treat and diagnose cancer. Interagency activities include OPSO co-funding transdisciplinary cancer research with the National Science Foundation in 2011 and 2012 via the Physical/LIfe sciences Early-stage Research (PLIER) awards (also known as Physical and Engineering Sciences in Oncology (PESO) awards).

Additional information about CSSI can be found at http://cssi.cancer.gov/.

Center to Reduce Cancer Health Disparities

The Center to Reduce Cancer Health Disparities (CRCHD) is the cornerstone of NCI's efforts to reduce the unequal burden of cancer in racially/ethnically diverse, and other underserved populations. The Center supports a broad range of studies in basic, genomic, translational, community- and population-based research focused on understanding the biological and non-biological roots of cancer health disparities.

CRCHD's roots lie in its community-based participatory research (CBPR) paradigm and programs, including the *Community Networks Program (CNP)* and its expanded successor, *Community Networks Program Centers (CNPC)*. CNPC is designed to significantly improve access to and use of beneficial interventions in communities experiencing a greater burden of cancer. CBPR investigators employ a unique approach to examining and reducing cancer health disparities by actively engaging communities in the research process. Local community agencies, in collaboration with trained researchers, participate in all aspects of research, training, and outreach, including helping to define their community's particular problems that lead to disparities, and designing solutions that are culturally sensitive to their needs.

CRCHD is also dedicated to training a cancer research workforce that reflects an increasingly diverse America. In providing a smoother path towards careers in biomedical science, the Center is attracting and engaging the nation's most talented students from underrepresented populations, who otherwise are at risk of being lost from the training pipeline. Their diverse perspectives are critical in ensuring that the science conducted addresses the health needs of all people. CRCHD offers two innovative and comprehensive diversity training programs—the *Continuing Umbrella of Research Experiences (CURE)* and *Partnerships to Advance Cancer Health Equity (PACHE)* (formerly known as the Minority Institution/Cancer Center Partnership Program [MI/CCP]). CURE introduces promising racially/ethnically diverse and other underrepresented students, researchers, and faculty to cancer research and provides them with a continuum of competitive training and career development opportunities leading to successful careers as independent cancer investigators. The CURE program offers full funding to protect research time, incorporates important mentoring relationships with advanced researchers, and includes valuable networking opportunities. PACHE was developed to help expand high-level training opportunities available to CURE trainees. The program focuses on creating long-term and mutually beneficial partnerships between NCI-designated Cancer Centers and academic institutions serving racially/ethnically diverse communities. These partnerships enhance cancer research, and diversity training and

career development opportunities, as well as expand outreach to underserved communities.

In addition, CRCHD supports basic research, which focuses on increasing our understanding of the biological determinants of cancer health disparities in racially/ethnically diverse populations. Biological variations, either naturally or in conjunction with environmental exposures, may lead to differences in susceptibility to cancers and therapeutic responsiveness. This broader research view allows a more complex picture of the biological, behavioral, and socioeconomic roots of cancer disparities, and sets the stage for better-targeted, more precise interventions and community outreach. Basic scientists are integrated into CRCHD's PACHE and CURE programs, which offer an array of cancer research training opportunities for individuals from underrepresented populations.

CRCHD promotes a multidisciplinary, team-based paradigm for understanding and reducing cancer health disparities. The *Geographical Management of Cancer Health Disparities Program including Biospecimen Science (G/BMaP)* is a national strategy that links CRCHD's flagship initiatives—PACHE, CNPC, and CURE—within six regional, disparities-focused networks for cancer health disparities research, diversity training, and resource-sharing infrastructure. The *National Outreach Network (NON)* is a strategy that bridges NCI-supported outreach and community education efforts with cancer health disparities research and diversity training programs by stimulating linkages among NCI, grantee institutions, researchers, and communities. CRCHD is also undertaking a collaborative initiative with the *NCI Community Cancer Centers Program (NCCCP)*, which involves providing technical support to NCCCP's health disparities efforts.

For more information about CRCHD, its programs, and cancer health disparities, visit http://crchd.cancer.gov.

Office of HIV and AIDS Malignancy

The Office of HIV and AIDS Malignancy (OHAM) is an office within NCI's Office of the Director. OHAM has responsibility for broad oversight of HIV/AIDS and HIV malignancy research throughout NCI. OHAM coordinates and prioritizes NCI research in HIV/AIDS and HIV malignancy and also directly initiates and manages certain research programs. OHAM interfaces with the NIH Office of AIDS Research and other NIH Institutes and Centers to effectively coordinate the HIV/AIDS research effort.

SBIR Development Center

The SBIR Development Center manages the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs at the NCI. These programs are NCI's engine of innovation for developing and commercializing novel technologies and products to prevent, diagnose, and treat cancer. A range of funding opportunities is offered to the small business community. The Center offers advice for applicants and fosters partnerships and collaborations between small businesses and third-party organizations. In addition, the Center serves as a mentor to SBIR-funded companies regarding their technology development plans, and their regulatory and commercialization strategies, helping to accelerate the development of novel technologies and products. The primary goal of these efforts is to enhance the return on investment of the SBIR program for the benefit of the cancer community and public health in general. SBIR and STTR serve as two of the largest sources of early stage technology financing in the United States.

For more information on the SBIR and STTR Programs, visit http://sbir.cancer.gov.

Office of Cancer Centers

The Cancer Centers Program within NCI's Office of the Director supports 57 NCI-designated Cancer Centers nationwide that are actively engaged in transdisciplinary research to reduce cancer incidence, morbidity, and mortality.

These NCI-designated Cancer Centers are a major source of discovery of the nature of cancer and of the development of more effective approaches to cancer prevention, diagnosis, and therapy. They also deliver medical advances to patients and their families, educate health-care professionals and the public, and reach out to underserved populations. They are characterized by strong organizational capabilities, institutional commitment, and trans-disciplinary, cancer-focused science; experienced scientific and administrative leadership, and state-of-the-art cancer research and patient care facilities.

NCI-designated Cancer Centers are funded through the P30 Cancer Center Support Grant. These awards fund formal research programs that foster interactions between basic laboratory, clinical, and population scientists; access for investigators to shared services and technologies that are necessary to their research efforts; and other scientific infrastructure.

Additional information can be found at http://cancercenters.cancer.gov.

Frederick National Laboratory for Cancer Research

The Frederick National Laboratory for Cancer Research (FNLCR) is a Federally Funded Research and Development Center (FFRDC) operated by SAIC-Frederick, Inc., for the National Cancer Institute. The lab provides quick response capabilities and meets special long-term research and development needs for NCI. The FFRDC also supports other institutes of NIH and a wide range of research collaborations and partnerships with third parties, consistent with NCI's mission. Activities include building cross-disciplinary collaborations and teams, bridging the gap between late discovery and early development of diagnostics and therapeutics, developing cross-cutting technology platforms, and developing data standards. The overarching goal is to accelerate treatments for cancer and AIDS patients.

FNLCR has advanced technologies and innovative platforms that support NCI's mission, from basic research to translational and clinical studies. These include:

- Cancer Model Development
- Genetics and Genomics
- Proteins and Proteomics
- Clinical Assay Development
- Nanotechnology Characterization

- High-Performance Biomedical Computing
- Advanced Biomedical Imaging

Additional information is available at http://frederick.cancer.gov.

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National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

National Eye Institute

Mission | Important Events | Director | Programs | Photo Gallery

The National Eye Institute (NEI) conducts and supports research, training, health information dissemination, and other programs with respect to blinding eye diseases, visual disorders, mechanisms of visual function, preservation of sight, and the special health problems of individuals who are visually impaired or blind.

Vision research is supported by the NEI through research grants and training awards made to scientists at more than 250 medical centers, hospitals, universities, and other institutions across the country and around the world. The NEI also conducts laboratory and patient-oriented research at its own facilities located on the NIH campus in Bethesda, Maryland.

The NEI has established the National Eye Health Education Program, a partnership of more than 65 professional, civic, and voluntary organizations and government agencies concerned with eye health. The program represents an extension of the NEI's support of vision research, where results are disseminated to health professionals, patients, and the public.

IMPORTANT EVENTS IN NEI HISTORY

August 16, 1968—National Eye Institute was established when President Lyndon B. Johnson signed Public Law 90-489. The new NIH institute was the first government organization solely dedicated to research on human visual diseases and disorders. NEI officially began operations on December 26, 1968, and the National Advisory Eye Council met for the first time on April 3, 1969.

April 3-4, 1969—First meeting of the NEI National Advisory Eye Council is held.

January 11, 1970—Dr. Carl Kupfer was appointed NEI Director.

December 15, 1970—Reorganization of the NEI resulted in the formation of an Office of Biometry and Epidemiology; an Office of the Director of Intramural Research; the Laboratory of Vision Research; and a Clinical Branch.

April 1975—Publication of the National Advisory Eye Council's report, *Vision Research Program Planning*, was the first comprehensive assessment of major needs and opportunities in vision research in the United States.

April 1,1976—Results from the Diabetic Retinopathy Study proved that laser treatment is effective for treating diabetic retinopathy.

April 1978—Publication of the National Advisory Eye Council's 5-year plan, *Vision Research: 1978-1982*, which included review and analysis of vision research and research training in the United States and discussion of future priorities.

September 1978—The Laboratory of Sensorimotor Research was established within the intramural research program.

June 1981—The Laboratory of Molecular and Developmental Biology was established within the intramural research program.

May 1983—The National Advisory Eye Council's second 5-year plan, *Vision Research—A National Plan 1983-1987*, recommended future NEI programs.

July 19, 1984—The Office of Biometry and Epidemiology was transferred out of the Office of the Director and established as the Biometry and Epidemiology Program ; now Division of Epidemiology and Clinical Applications.

August 1985—An Intramural Research Program reorganization of the Laboratory of Vision Research created the Laboratories of Mechanisms of Ocular Diseases; Retinal Cell and Molecular Biology; and Immunology.

1987—The National Advisory Eye Council's *Vision Research—A National Plan 1983-1987*, and *1987 Evaluation and Update*, discussed accomplishments since the 1983-87 plan was published, evaluated the status of NEI-supported research activities, and revised priorities for the next 2 years.

December 1987—The Collaborative Clinical Vision Research Branch was established to provide overall scientific management and administration for NEI grants, contracts, and cooperative agreements supporting clinical trials and epidemiologic studies.

March 1988—Results from the Cryotherapy for Retinopathy of Prematurity Study proved that freeze treatment reduces blindness in premature infants.

February 1989—The Office of International Program Activities was created to enhance coordination of NEI's international activities, particularly those relating to cooperation with nongovernmental organizations, international agencies, and the international components of other Federal agencies.

October 1989—Results from the Early Treatment Diabetic Retinopathy Study provided further evidence that laser treatment is highly effective in treating diabetic retinopathy.

December 1989—Results from the Fluorouracil Filtering Surgery Study proved that fluorouracil improves glaucoma surgery outcome.

February 10, 1990—The Ophthalmic Genetics and Clinical Services Branch (now Ophthalmic Genetics and Visual Function Branch) was established in the intramural program.

December 1990—Results from the Glaucoma Laser Trial proved that laser therapy shows promise as an alternative to glaucoma drugs.

October 1991—Results from the Foscarnet and Ganciclovir Study showed that patients with AIDS treated for cytomegalovirus retinitis with foscarnet lived longer than those who received the standard treatment of ganciclovir.

December 1991—The NEI established the National Eye Health Education Program, following Congressional encouragement that NEI increase its commitment to the prevention of blindness through public and professional education programs that encourage early detection and timely treatment of glaucoma and diabetic eye disease.

February 1992—Results from the Optic Neuritis Treatment Trial proved that oral corticosteroids alone were found ineffective for optic neuritis.

October 1992—Results from the Collaborative Corneal Transplantation Study proved that patient donor blood type matching improves corneal transplantation outcome.

March 1993—The Early Treatment for Diabetic Retinopathy Study 5-year follow-up showed that current treatment for diabetic retinopathy is 95 percent effective in maintaining vision.

Spring 1993-Spring 1995—A "Celebration of Vision Research" commemorated the NEI's 25th anniversary.

June 1993—The NEI and its advisory body, the National Advisory Eye Council, produced and distributed its fifth long-range plan, *Vision Research—A National Plan: 1994-1998*, that contained policy recommendations and scientific program priorities.

June 1993—Results from the Retinitis Pigmentosa Study reported most adults with retinitis pigmentosa (RP) should take a daily 15,000 IU vitamin A palmitate supplement.

December 1993—The Optic Neuritis Treatment Trial found that corticosteroids for optic neuritis lowers risk of developing multiple sclerosis.

October 1994—Ten-year results released from the Radial Keratotomy (RK) Study found that RK remained a reasonably safe and effective technique to improve distance vision.

December 1994—Results from the Cytomegalovirus (CMV) Retinitis Study reported that a new drug-releasing device was effective in treating CMV retinitis in people with AIDS.

February 1995—The Ischemic Optic Neuropathy Decompression Trial was haulted when results found eye surgery was ineffective for optic neuropathy and may be harmful.

October 1995—Results from the Endophthalmitis Vitrectomy Study found that vitrectomy surgery is not necessary for three-fourths of patients who develop an intraocular bacterial infection called endophthalmitis.

December 1995—Seven year follow up results from the Glaucoma Laser Trial found that laser therapy is a safe and effective alternative to eye drops as a first-line treatment for patients with newly diagnosed primary open-angle glaucoma.

January 1996—Results from the Cytomegalovirus (CMV) Retinitis Retreatment Trial found that a combination of two antiviral drugs is more effective than either drug alone for controlling recurrences of CMV retinitis in people with AIDS.

April 1996—Five and a half year follow up results from the Cryotherapy for Retinopathy of Prematurity Study confirmed that cryotherapy applied to the eyes of premature babies helps save their sight.

August 1996—The Monoclonal Antibody Cytomegalovirus Retinitis Trial was stopped when the drug, MSL 109 did not slow the progression of CMV retinitis.

May 1997—Results from a clinical trial found that a combination of protease inhibitors and other anti-HIV drugs used to treat people with AIDS can prevent or delay the progression of CMV retinitis.

May 1998—Results from the Effects of Light Reduction on Retinopathy of Prematurity have determined that light reduction has no effect on the development of retinopathy of prematurity (ROP) in low birth weight infants.

June 1998—Results from the Collaborative Ocular Melanoma Study found that the survival rates for two alternative treatments for primary eye cancer—radiation therapy and removal of the eye—are about the same.

June 1998—The NEI and National Advisory Eye Council produced and distributed *Vision Research—A National Plan: 1999-2003*, that contained policy recommendations and scientific program priorities. In developing this five-year plan, the NEI and and its advisory council assembled panels of over 100 experts representing each of NEI's formal programs and special interest areas. In drafting this plan, special consideration was given to the purpose, intent, and requirements of the Government Performance and Review Act.

July 1998—Results from the Advanced Glaucoma Intervention Study found that blacks with advanced glaucoma benefit more from a regimen that begins with laser surgery and whites benefit more from one that begins with an operation called a trabeculectomy.

July 1998—Results from the Herpetic Eye Disease Study found that an antiviral drug, often used to suppress genital herpes, also decreases the recurrence of herpes of the eye.

October 19, 1999—The NEI launched the Low Vision Education Program, part of the National Eye Health Education Program.

2000—The NEI was designated the lead agency for a new focus area on vision in the U.S. Department of Health and Human Services Healthy People 2010 initiative.

February 2000—Researchers found that modest supplemental oxygen given to premature infants with moderate cases of retinopathy of prematurity (ROP) may not significantly improve ROP, but definitely does not make it worse.

July 15, 2000—Carl Kupfer, M.D., stepped aside after 30 years as Director of the NEI. Jack A. McLaughlin, Ph.D., is named Acting Director, NEI.

June 17, 2001—Paul A. Sieving , M.D., Ph.D., assumes duties as Director, NEI.

October 12, 2001—Results from the Age-Related Eye Disease Study (AREDS) found high levels of antioxidants and zinc significantly reduce the risk of advanced age-related macular degeneration (AMD) and its associated vision loss.

February 14, 2002—100th meeting of the National Advisory Eye Council was held.

March 2002—Results from the Amblyopia Treatment Study found that atropine eye drops given once a day to treat amblyopia, or lazy eye, work as well as the standard treatment of patching one eye.

June 2002—Results from the Ocular Hypertension Treatment Study discovered that eye drops used to treat elevated pressure inside the eye can be effective in delaying the onset of glaucoma.

October 2002—Results from the Early Manifest Glaucoma Trial found that immediately treating people who have early stage glaucoma can delay progression of the disease.

May 2003—Researchers found that patching the unaffected eye of children with moderate amblyopia for two hours daily works as well as patching the eye for six hours.

October 2003—The NEI published and released its National Plan for Eye and Vision Research. The first strategic plan produced through the new, two-phase planning process. This ongoing planning process involves the assessment of important areas in eye and vision research and the development of new goals and objectives that address outstanding needs and opportunities for additional progress. Workshops, conferences, or symposia in critical or emerging areas of science are conducted during the second phase of the planning process to explore how they might be applied to diseases of the eye and disorders of vision.

December 2003—Results from the Early Treatment for Retinopathy of Prematurity (ROP) Study demonstrated that premature infants, who are at the highest risk for developing vision loss from retinopathy of prematurity, will retain better vision when therapy is administered in the early stage of the disease.

June 2004—In a follow up study from the Ocular Hypertension Treatment Study, researchers reported eye drops that reduce elevated pressure inside the eye can delay or possibly prevent the onset of glaucoma in African Americans at higher risk for developing the disease.

August 2004—Results from the Los Angeles Latino Eye Study, the largest, most comprehensive epidemiological analysis of visual impairment in Latinos conducted in the U.S., found that Latinos had high rates of eye disease and visual impairment.

November 2004—Results from the Submacular Surgery Trials indicated that vision does not improve substantially for patients with age-related macular degeneration (AMD) who underwent surgery to remove lesions of new blood vessels, scar tissue, or possible bleeding beneath the retina.

March 2005—Results from four studies identified a gene that is strongly associated with a person's risk for developing age-related macular degeneration.

April 2005—Researchers show that many children age seven through 17 with amblyopia (lazy eye) may benefit from treatments that are more commonly used on younger children.

August 2005—NIH Director Dr. Elias A. Zerhouni and Dr. Maharaj K. Bahn, Secretary, of the Department of Biotechnology, India, signs a United States-India Statement of Intent for collaboration on expansion of vision research.

May 2006—A clinical trial concluded that a single dose of azithromycin taken by mouth after surgery reduces by one-third the recurrence of a vision-threatening eyelid condition called trichiasis.

September 2006—The National Ophthalmic Disease Genotyping and Phenotyping Network (eyeGENE ®) was created by the NEI to foster research into the genetic causes of ophthalmic disorders by broadening patient and family access to genetic diagnostic testing and by maintaining a national repository of genetic samples from highly characterized individuals.

November 2006—Results from the Complications of Age-Related Macular Degeneration (AMD) Prevention Trial indicated that low-intensity laser is ineffective in preventing complications of AMD or loss of vision.

September 2007—The Neurobiology-Neurodegeneration and Repair Laboratory was established in the intramural program .

July 2008—Researchers found that a promising new drug therapy used to treat diabetic macular edema proved less effective than traditional laser treatments.

September 2008—Results from the phase I clinical trial for gene therapy found that three young adults with Leber congenital amaurosis--a severe degenerative disease of the retina caused by a mutation in the RPE65 gene—reported improvements in vision after undergoing a specialized gene transfer procedure.

October 2008 —Results from the Convergence Insufficiency Treatment Trial found that approximately 75 percent of patients with convergence insufficiency who received in-ofice therapy by a trained therapist plus at-home treatment reported fewer and less severe symptoms related to reading and other near work.

August 2009—Three young adults who received gene therapy for Leber congenital amaurosis remained healthy and maintained previous visual gains one year later (see September 2008).

September 2009—Scientists found that laser therapy is equivalent to two different dosages of corticosteroid medications for treating vision loss from the blockage of small veins in the back of the eye, a condition known as branch retinal vein occlusion (BROV).

September 2009—Researchers have identified the first long-term, effective treatment to improve vision and reduce vision loss associated with blockage of large veins in the eye.

April 2010—A large genetic study of age-related macular degeneration (AMD) identified three new genes associated with this blinding eye disease-two involved in the cholesterol pathway.

April 2010—Researchers have shown that ranibizumab eye injections, often in combination with laser treatment, result in better vision than laser treatment alone for diabetes-associated swelling of the retina.

April 2010—Long-term results of the Early Treatment for Retinopathy of Prematurity study confirmed that the visual benefit of early treatment for selected infants continues through six years of age.

May 2010—Results from the Los Angeles Latino Eye Study (LALES) found that Latinos have higher rates of developing visual impairment, blindness, diabetic eye disease, and cataracts than non-Hispanic whites.

June 2010—Results from the Action to Control Cardiovascular Risk in Diabetes (ACCORD) Eye Study (ACCORD) study found that in adults with type 2 diabetes, two therapies may slow the progression of diabetic retinopathy.

April 2011—Researchers report results from the first year of a two-year clinical trial Comparison of AMD Treatments Trials (CATT) that Avastin, a drug approved to treat some cancers and that is commonly used off-label to treat age-related macular degeneration (AMD), is as effective as the approved drug Lucentis for the treatment of AMD.

August 2012—The NEI issues its *Challenge to Identify Audacious Goals in Vision Research and Blindness Rehabilitation* as part of a new government-wide effort to bring the best ideas and top talent to bear on our nation's most pressing challenges using prize competitions. The NEI Audacious Goals Initiative is an expansion of the institute's strategic planning that aims to forge new approaches to persistent challenges in vision research.

August 2012—NEI published *Vision Research: Needs, Gaps, and Opportunities*, its most recent compilation of panel reports that describes highlights of progress, current needs, and opportunities in all six major NEI program areas: retinal diseases; corneal diseases; lens and cataract; glaucoma and optic neuropathies; strabismus, amblyopia, and visual processing; and low vision and blindness rehabilitation. This compilation , issued every five to seven years, represents the work of hundreds of scientists, clinicians, and stakeholders involved in vision research. http://www.nei.nih.gov/strategicplanning/.

BIOGRAPHICAL SKETCH OF NEI DIRECTOR PAUL A. SIEVING, M.D., PH.D.

Dr. Sieving was named director of the National Eye Institute, NIH, in 2001. He came from the University of Michigan Medical School where he was the Paul R. Lichter Professor of Ophthalmic Genetics and the founding director of the Center for Retinal and Macular Degeneration in the Department of Ophthalmology and Visual Sciences.

After undergraduate work in history and physics at Valparaiso University, Dr. Sieving studied nuclear physics at Yale Graduate School in 1970-73 under D. Allan Bromley and attended Yale Law School from 1973-74. He received his M.D. from the University of Illinois College of Medicine in 1978 and a Ph.D. in bioengineering from the University of Illinois Graduate College in 1981. Dr. Sieving completed an ophthalmology residency at the University of Illinois Eye and Ear Infirmary in Chicago. After post-doctoral study of retinal physiology with Roy H. Steinberg in 1982-83 at the University of California, San Francisco, he did a clinical fellowship in genetic retinal degenerations with Eliot Berson in 1984-85 at Harvard Medical School, Massachusetts Eye and Ear Infirmary.

Dr. Sieving is known internationally for studies of human progressive blinding genetic retinal neurodegenerations, including retinitis pigmentosa, and rodent models of these conditions. His laboratory study of pharmacological approaches to slowing degeneration in transgenic animal models led to the first human clinical trial of ciliary neurotrophic factor (CNTF) for retinitis pigmentosa, published in Proceedings of the *Proceedings of the National Academy of Sciences, 2006.*. He also developed a mouse model of X-linked retinoschisis and successfully treated this using gene therapy which restored retinal function. He maintains a clinical practice at NEI for patients with these and other genetic retinal diseases, including Stargardt juvenile macular degeneration.

Dr. Sieving served as vice chair for Clinical Research for the Foundation Fighting Blindness from 1996-2001. He is on the Bressler Vision Award committee and is a jury member for the 1 million annual 'Vision Award' of the Champalimaud Foundation, Portugal. He was elected to membership in the American Ophthalmological Society in 1993 and the Academia Ophthalmologica Internationalis in 2005. He received an honorary Doctor of Science from Valparaiso University in 2003 and has been named among the 'Best Doctors in America' multiple years. He has received numerous awards, including the Research to Prevent Blindness Senior Scientific Investigator Award, 1998; the Alcon Research Institute Award, 2000; and the Pisart Vision Award from the New York Lighthouse International for the Blind in 2005. Dr. Sieving was elected to the Institute of Medicine of the National Academy of Sciences in 2006.

NEI DIRECTORS

Name	In Office from	To
Carl Kupfer, M.D.	January 11, 1970	July 15, 2000
Jack A. McLaughlin, Ph.D. (Acting)	July 16, 2000	June 16, 2001
Paul A. Sieving, M.D., Ph.D.	June 17, 2001	Present

MAJOR EXTRAMURAL PROGRAMS

NEI's extramural research activities are organized into six scientific areas: retinal diseases; corneal diseases; lens and cataract; glaucoma and optic neuropathies; strabismus, amblyopia, and visual processing; and low vision and blindness rehabilitation. In addition, the NEI supports research activities that cross-cut the major program areas. These cross-cutting areas of emphasis are ocular genetics; ocular infection, inflammation, and immunology; small business innovative research; research training; oculomotor systems, and collaborative clinical research.

Retinal Diseases

NEI-supported investigations include studies of the development, molecular and cell biology, human genetics, and metabolism of the photoreceptor cells and their dependence on the underlying retinal pigment epithelium; the mechanism of the retina's response to light and the initial processing of information that is transmitted to the visual centers of the brain; and the pathogenesis, etiology, molecular biology and genetics, and treatment of retinal diseases such as diabetic retinopathy; uveitis; and retinitis pigmentosa, age-related macular degeneration, and retinal detachment. Genome-wide scans have revealed inflammatory genetic factors associated with increased risk for age-related macular degeneration.

Corneal Diseases

NEI-supported projects include studies of the regulation of genes that express proteins unique to corneal tissue; details of the assembly of corneal extracellular matrices; mechanisms that maintain corneal hydration and transparency; physiologic basis for immune privilege in the cornea; cell biology of corneal wound healing; corneal biomechanics; corneal infections; and the pathogenesis of corneal transplant rejection.

Lens and Cataract

NEI-supported research includes studies of normal lens development and aging; the molecular and cellular characterization of lens transparency; control of lens cell division; structure and regulation of the expression of lens-specific genes; the impact of environmental insults on the lens; and the pathogenesis of human cataract.

Glaucoma and Optic Neuropathies

NEI supports a range of research designed to better understand the pathophysiology underlying glaucoma, the discovery of drugs and surgical techniques for its treatment, the basis of racial and ethnic disparities in the incidence and severity of the disease, and the development of procedures for earlier diagnosis. Studies include the molecular genetics of glaucoma syndromes; physiologic mechanisms regulating fluid flow in the disease; the cell and molecular biology of optic nerve damage; ganglion cell death; mechanisms of neuroprotection as a possible treatment strategy, and genome-wide scans to detect disease risk factors.

Strabismus, Amblyopia, and Visual Processing

NEI supports studies concerned with the function of the neural pathways from the eye to the brain, the central processing of visual information, visual perception, the optical properties of the eye, the function of the pupil, and molecular cell biology of the extraocular muscles. Support is provided for research on the pathogenesis and treatment of eye movement disorders, and the development of myopia. Particular emphasis is placed on studies of strabismus and amblyopia, as these are frequent causes of lifelong visual impairment.

Low Vision and Blindness Rehabilitation

NEI supports research in low vision and rehabilitation of people with visual impairments and blindness. Examples include projects aimed at improving the methods of specifying, measuring, and categorizing loss of visual function; devising strategies to help visually impaired people maximize the use of their residual vision; systematically evaluating new and existing visual aids; and studying the optical, electronic, and other rehabilitative needs of people with visual impairments.

Ocular Genetics

The study of genetic factors that underlie structure, function, and disease susceptibility is common to all scientific programs of the NEI. Therefore, the large-scale projects that employ a common genetic technology have been organized into an overarching grant portfolio. The program director not only manages these extramural grants but also serves a liaison role in integrating and stimulating the development of NEI intramural/extramural ocular genetics resources. Projects include NEIGHBOR, a collaborative effort to collect primary open-angle glaucoma cases and controls to sufficiently power a genome-wide association study to identify genetic variants that significantly contribute to the disease.

Ocular Infection, Inflammation, and Immunology

The study of immunologic, inflammatory, and infectious processes that underlie disease pathogenesis and susceptibility is common to all scientific programs of the NEI. Therefore, projects that focus on research in these areas have been organized into an overarching grant portfolio.

Myopia and Refractive Error

This cross-cutting scientific program supports studies to delineate the etiology of myopia, identify the biochemical pathways associated with control of the growth of the eye, and determine risk factors associated with the development of myopia and other refractive errors.

Oculomotor Systems

This program supports studies to develop a better understanding of the neural control, biomechanical properties, and anatomical relationships of the tissues around the eye muscles and the roles they play in guiding eye movements, as well as to attain a clearer understanding of how signals for voluntary eye movements are processed within cortical circuits.

Collaborative Clinical Research

NEI supports single-center and multicenter clinical trials and other epidemiologic and health services research. Collectively, these projects are directed toward furthering knowledge about the predictors for and natural history of visual system diseases and disorders and developing better prevention and management strategies for these conditions.

DIVISION OF INTRAMURAL RESEARCH

Office of the Scientific Director

The Office of the Scientific Director (OSD) supports basic and clinical research within the Division of Intramural Research (DIR) that is carried out by over 150 researchers (investigators, staff scientists and clinicians, and scientific support staff) in various research disciplines. The NEI intramural program also provides training for about 120 fellows and students. In addition, the OSD oversees several shared core facilities that provide intellectual and technical support in genetic engineering, histopathology, biological imaging, visual function, and flow cytometry.

Examples of research carried in DIR include:

- pilot clinical trials
- CNS reward circuits that control behavior
- structure and function of genes and proteins with key roles in normal, aging and diseased eye
- genetically engineered models for human eye disease
- nerve cell communications that transmit visual information across the retina
- biochemistry of the visual cycle
- genetic susceptibility for AMD and diabetic retinopathy
- genetic defects and pathways of retinal degeneration
- genetic epidemiology
- genetic origins of inherited ophthalmic diseases
- childhood blinding diseases and inheritance
- neuronal glial Interactions in retinal disease
- animal models of inflammatory disease
- inflammatory mechanisms in eye disease
- physiology of the RPE and iPS cell-derived retinal pigment epithelia
- protection of retinal neurons against elevated intraocular pressure in glaucoma
- lipid oxydation in the retina and the RPE
- gene therapeutics to treat X-linked retinoschisis, retinitis pigmentosa, and macular degeneration

Laboratory of Immunology

The goal of the Laboratory of Immunology is to perform cutting-edge, quality research in immunology and infectious diseases that is designed to help scientists better understand the normal physiologic state and the processes that perturb it, with special emphasis on inflammatory mechanisms in the eye as a model system. In pursuit of this goal the laboratory capitalizes on the unique research environment at NIH and the constant interaction between clinician and basic researcher.

Laboratory of Molecular and Developmental Biology (1981-2011)

The Laboratory of Molecular and Developmental Biology conducted basic research on cellular and molecular aspects of the eye, with a focus on gene expression and function. Much of the laboratory's research concerned development, evolution, and glaucoma. The focus was on the expression and function of genes. The Laboratory was closed in June 2011.

Laboratory of Retinal Cell and Molecular Biology

The Laboratory of Retinal Cell and Molecular Biology plans, conducts, and directs basic research in normal and abnormal functioning of the retina, other ocular tissues, and in retinal diseases, particularly those of a genetic nature. Visual process mechanisms are emphasized as well as the function of neural, glial, and pigment epithelial cells.

Laboratory of Sensorimotor Research

The goal of the Laboratory of Sensorimotor Research (LSR) is to understand the fundamental brain mechanisms that allow sensory-motor coordination. The laboratory concentrates on the system within the brain that is probably best understood in the control of the complex activities of the visual/oculomotor system. LSR's center of interest is how this system works in humans, both normally and when it fails as a result of disease or trauma. The ability to guide movements under sensory control is one of the most critical of human abilities. The use of this ability ranges from the mundane coordination needed in everyday life to the precision of the athletic achievement. Disorders of this ability are devastating and cost billions of dollars in custodial health care.

Neurobiology Neurodegeneration and Repair Laboratory

The goal of the Neurobiology Neurodegeneration and Repair Laboratory is to develop novel treatment modalities for blinding retinal diseases based on the fundamental understanding of genetic defects and/or biological pathways underlying differentiation, homeostasis, aging, and disease pathogenesis.

Ophthalmic Genetics and Visual Function Branch

The Ophthalmic Genetics and Visual Function Branch aims to understand developmental, genetic, molecular, and cellular aspects of ocular biology in health and disease and to enable, broaden, and strengthen basic and translational science throughout NEI. An overarching goal is to identify the underlying genes, genetic networks, and drug targets in disease and to utilize this knowledge to increase understanding of vision biology and the rational development of successful therapeutic interventions to slow or reverse disease progression. Over many years of clinical research, the Branch has compiled an impressive database of patients with fully characterized phenotypic information on a host of heritable ocular disorders. These disorders are amenable to further molecular genetic analysis and to future treatment protocols.

Office of the Clinical Director

The Office of the Clinical Director coordinates, supervises and supports intramural clinical research on the cause, diagnosis, prevention, and treatment of diseases of the visual system and fosters the translation of advances in laboratory research into clinical applications. The Office provides infrastructure needed to promote high quality clinical research and to ensure patient safety, including protocol review, clinical informatics, and data and safety management; (2) monitors quality assurance of the intramural clinical research program; (3) coordinates the credentialing of health care providers within the Institute; (4) administers the ophthalmology consultation service to provide eye care for patients referred from other Institutes; and; (5) coordinates and provides clinical research training for NIH staff, fellows, and students.

Division of Epidemiology and Clinical Applications

The Division of Epidemiology and Clinical Applications has three main functions: research, education, and consultation. Research is the dominant function. It is the Division's mission to plan, develop, and conduct human population studies concerned with the cause, prevention, and treatment of eye disease and vision disorders, with emphasis on the major causes of blindness. This includes studies of incidence and prevalence in defined populations, prospective and retrospective studies of risk factors, natural history studies, clinical trials, genetic studies, and studies to evaluate diagnostic procedures. The Division carries out a program of education in biometric and epidemiologic principles and methods for the vision research community. This program consists of courses, workshops, a fellowship program for ophthalmologists, publications, and consultation and collaboration on research. Finally, the Division provides biometric and epidemiologic assistance to NEI intramural and extramural staff and to vision research workers elsewhere. The assistance ranges from consultation to collaboration as co-investigators. It continues to provide scientific support to investigators at the NIH Clinical Center as well as extramurally.

U.S. Department of Health & Human Services

National Institutes of Health
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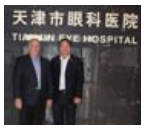
Recent Photos from the National Eye Institute (NEI)

2008 PHOTOS



On a trip to China in 2008, NEI Director Dr. Paul A. Sieving (l) met with Dr. Kanxing Zhao (r), director of the Tianjin Eye Hospital. While other health care professionals observed, Dr. Sieving examined a 60-year-old man whose vision had been deteriorating. Their discussions resulted in a diagnosis of choroidal neovascular age-related macular degeneration, which causes loss of vision from the growth of new blood vessels in the eye. The man underwent imaging tests and was later evaluated for treatment.
lo-res | hi-res

2005 PHOTOS

NIH Director Dr. Elias A. Zerhouni (seated left) and Dr. Maharaj K. Bhan, secretary of the Department of Biotechnology, India (seated right) sign the Statement of Intent for the Indo-U.S. Collaboration on Expansion of Vision Research, August 24, 2005. The signing took place at the Lawton Chiles International House on the NIH campus in Bethesda, Maryland. Looking on are Tina Chung of NIH's John E. Fogarty International Center (left) and Dr. Kamal K. Dwivedi, counsellor for science and technology, Embassy of India (right).

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National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

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U.S. Department of Health & Human Services

National Institutes of Health
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National Heart, Lung, and Blood Institute

Mission | Important Events | Legislative Chronology | Director | Programs | Photo Gallery

MISSION

The National Heart, Lung, and Blood Institute (NHLBI) provides global leadership for a research, training, and education program to promote the prevention and treatment of heart, lung, and blood diseases and enhance the health of all individuals so that they can live longer and more fulfilling lives.

The NHLBI stimulates basic discoveries about the causes of disease, enables the translation of basic discoveries into clinical practice, fosters training and mentoring of emerging scientists and physicians, and communicates research advances to the public. It creates and supports a robust, collaborative research infrastructure in partnership with private and public organizations, including academic institutions, industry, and other government agencies. The Institute collaborates with patients, families, health care professionals, scientists, professional societies, patient advocacy groups, community organizations, and the media to promote the application of research results and leverage resources to address public health needs. The NHLBI also collaborates with international organizations to help reduce the burden of heart, lung, and blood diseases worldwide.

IMPORTANT EVENTS IN NHLBI HISTORY

June 16, 1948—President Harry S. Truman signed the National Heart Act, creating and establishing the National Heart Institute (NHI) in the Public Health Service (PHS) and the National Advisory Heart Council.

August 1, 1948—Surgeon General Leonard A. Scheele, by General Circular No. 36, Organization Order No. 14, established the NHI as one of the National Institutes of Health to assume responsibility for heart research, training, and administration as set forth in the National Heart Act. Intramural research projects in cardiovascular diseases and gerontology, conducted elsewhere in NIH, were transferred to the NHI. The director of the NHI was designated to lead and coordinate the total PHS heart program.

September 8, 1948—The National Advisory Heart Council held its first meeting. Dr. Paul Dudley White served as the Council's Executive Director.

January 1949—Cooperative research units were established at the University of California, University of Minnesota, Tulane University, and Massachusetts General Hospital. Pending completion of the NHI's own research organization and availability of further research facilities, the units were jointly financed by the NIH and the institutions.

July 1, 1949—The NHI intramural research program was established.

The Heart Disease Epidemiology Study at Framingham, Massachusetts, was transferred from the Bureau of State Services, PHS, to the NHI.

July 6, 1953—The Clinical Center admitted its first patient for heart disease research.

July 1, 1957—The first members of the NHI Board of Scientific Counselors began their terms. The Board was established in 1956 "to provide advice on matters of general policy, particularly from a long-range viewpoint, as they relate to the intramural research program."

February 19, 1959—The American Heart Association and the NHI presented a report to the Nation on "A Decade of Progress Against Cardiovascular Disease."

October 16, 1968—A Nobel Prize in Physiology or Medicine was awarded to Dr. Marshall W. Nirenberg, chief of the NHI Laboratory of Biochemical Genetics, for discovering the key to deciphering the genetic code. Dr. Nirenberg was the first NIH Nobel laureate and the first Federal employee to receive a Nobel Prize.

October 26, 1968—The NHI received the National Hemophilia Foundation's Research and Scientific Achievement Award for its "medical leadership ... tremendous stimulation and support of research activities directly related to the study and treatment of hemophilia."

November 10, 1969—The NHI was renamed the National Heart and Lung Institute (NHLI), reflecting expansion of functions.

February 18, 1971—In his Health Message to the Congress, President Richard M. Nixon identified sickle cell anemia as a high-priority disease target and called for increased Federal expenditures. Subsequently, the Health, Education, and Welfare (HEW) Assistant Secretary for Health and Scientific Affairs assigned the NIH and NHLI as the lead agencies responsible for coordinating a National Sickle Cell Disease Program.

June 12, 1972—HEW Secretary Elliot Richardson approved a nationwide program of hypertension information and education. The secretary appointed the Hypertension Information and Education Advisory Committee, chaired by the Director of NIH, and the Interagency Working Group, chaired by the Director of the NHLI, to implement the national effort.

July 1972—The NHLI initiated the National High Blood Pressure Education Program (NHBPEP).

July 14, 1972—Secretary Richardson approved a reorganization of NHLI, elevating the Institute to Bureau status within the NIH.

June 25, 1976—The NHLI was renamed the National Heart, Lung, and Blood Institute (NHLBI), reflecting an expansion in blood-related activities within the Institute.

November 1979—The results of the Hypertension Detection and Follow-up Program, a clinical trial initiated by the NHLBI in 1971, provided evidence that systematic, aggressive treatment of hypertension saves lives.

October 1981—The NHLBI Beta-Blocker Heart Attack Trial demonstrated benefits to those in the trial who received propranolol compared with the control group.

October 1983—The NHLBI Coronary Artery Surgery Study results demonstrated that mildly symptomatic patients with coronary artery disease can safely defer coronary artery bypass surgery until symptoms worsen.

January 1984—The NHLBI Lipid Research Clinics Coronary Primary Prevention Trial established conclusively that reducing total blood cholesterol reduces the risk of coronary heart disease in men at increased risk because of elevated cholesterol levels. Each 1% decrease in cholesterol was shown to reduce heart attack risk by 2%.

April 1985—Phase I of the NHLBI Thrombolysis in Myocardial Infarction Trial found that the new thrombolytic agent recombinant tissue plasminogen activator (rt-PA) is approximately twice as effective as streptokinase in opening thrombosed coronary arteries.

October 1985—NHLBI-supported researchers Michael S. Brown and Joseph L. Goldstein received the Nobel Prize in Physiology or Medicine for their discoveries concerning the regulation of cholesterol metabolism.

November 1985—The NHLBI initiated the National Cholesterol Education Program (NCEP).

June 1986—Results of the NHLBI Prophylactic Penicillin Trial demonstrated the efficacy of prophylactic penicillin in reducing morbidity and mortality associated with pneumococcal infections in children with sickle cell disease.

March 1989—The NHLBI initiated the National Asthma Education Program. The program was later renamed the National Asthma Education and Prevention Program (NAEPP).

September 1990—Scientists from the NHLBI and the National Cancer Institute began the first gene therapy trial in a human patient, a 4-year-old girl with an inherited immune dysfunction.

January 1991—The NHLBI developed an Obesity Education Initiative to educate the public and health professionals about obesity as an independent risk factor for cardiovascular disease and its relationship to other risk factors such as high blood pressure and high blood cholesterol.

June 1991—The NHLBI initiated the National Heart Attack Alert Program.

July 1991—The NHLBI Systolic Hypertension in the Elderly Program demonstrated that low-dose pharmacologic therapy of isolated systolic hypertension in those over age 60 significantly reduces stroke and myocardial infarction.

August 1991—The NHLBI Studies of Left Ventricular Dysfunction demonstrated that use of enalapril—an angiotensin converting enzyme inhibitor—causes significant reduction in mortality and hospitalization for congestive heart failure in patients with symptomatic heart failure.

January 1995—Results of the NHLBI Multicenter Study of Hydroxyurea demonstrated that hydroxyurea reduced the number of painful episodes by 50% in severely affected adults with sickle cell disease. This is the first effective treatment for adult sickle cell patients.

September 1995—Results of the NHLBI Bypass Angioplasty Revascularization Investigation demonstrated that patients on drug treatment for diabetes who had blockages in 2 or more coronary arteries and were treated with coronary artery bypass surgery had, at 5 years, a markedly lower death rate than similar patients treated with angioplasty.

May 1996—Framingham Heart Study investigators concluded that earlier and more aggressive treatment of hypertension is vital to preventing congestive heart failure.

The Treatment of Mild Hypertension Study demonstrated that lifestyle approaches, such as weight loss, a healthy eating plan, and physical activity, are crucial for reducing blood lipids in those treated for Stage I hypertension.

September 1996—Findings from the NHLBI Asthma Clinical Research Network indicated that inhalation of a beta-agonist at regularly scheduled times is safe for people with asthma but provides no greater benefit than use of the medication only when asthma symptoms occur.

November 1996—Two studies, the Dietary Approaches to Stop Hypertension (DASH) trial and the Trial of Nonpharmacologic Intervention in the Elderly, showed that lifestyle changes, such as modifying one's diet and losing weight, substantially reduce blood pressure in adults and eliminate the need for antihypertensive medication in some older patients.

January 1997—Results from the Pathobiological Determinants of Atherosclerosis in Youth program showed that atherosclerosis develops before age 20 and that high-density lipoprotein cholesterol, low-density lipoprotein (LDL) cholesterol, and cigarette smoking affect progression of atherosclerosis equally in women and men regardless of race.

May 1997—Results from the Antiarrhythmic versus Implantable Defibrillator clinical trial demonstrated that implantable cardiac defibrillators are superior to antiarrhythmic drug therapy for improving overall survival for patients with life-threatening heart arrhythmias.

October 1, 1997—The NHLBI is given responsibility for the Women's Health Initiative (WHI), a study begun in 1991 to address chronic diseases in women.

March 1999—A large clinical trial of mechanical ventilator use for intensive care patients with acute respiratory distress syndrome demonstrated that approximately 25% fewer deaths occurred among patients receiving small, rather than large, breaths of air from a mechanical ventilator.

September 2000—NHLBI-supported investigators identified a gene for primary pulmonary hypertension.

January 2001—Results of the Dietary Approaches to Stop Hypertension (DASH) Sodium Trial showed that dietary sodium reduction substantially lowers blood pressure in persons with high blood pressure; the greatest effect was seen when sodium reduction was combined with a diet rich in fruits and vegetables and low in saturated fat previously shown to lower blood pressure (i.e., the DASH diet).

April 2001—The NHLBI released international guidelines for diagnosis, management, and prevention of chronic obstructive pulmonary disease (COPD).

July 2001—A self-contained artificial heart was implanted in a patient for the first time.

September 2001—The NHLBI, along with the American Heart Association and other partners, launched a national Act in Time to Heart Attack Signs campaign to increase awareness of the symptoms of heart attack and the need for a fast response.

July 2002—The NHLBI stopped early the trial of estrogen plus progestin component of the WHI due to increased breast cancer risk and lack of overall benefits. The multicenter trial also found increases in coronary heart disease, stroke, and pulmonary embolism in participants on estrogen plus progestin compared to women taking placebo pills. In 2004, the WHI component evaluating estrogen-alone hormone therapy also was stopped early because the long-term risks of the medications outweighed the long-term benefits.

December 2002—Results of the NHLBI Atrial Fibrillation Follow-up Investigation of Rhythm Management Trial indicated that a strategy involving rate control rather than rhythm control may be the preferred treatment for patients with atrial fibrillation. The rate control strategy involves the use of less expensive drugs and fewer hospitalizations.

Results from the NHLBI Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT), the largest hypertension clinical trial ever conducted, showed that traditional diuretics are at least as good as newer medicines (calcium channel blockers and ACE inhibitors) to treat high blood pressure and to prevent some forms of heart disease. These findings were in addition to ALLHAT results from 2000, when researchers reported that an alpha-adrenergic blocker was less effective than the diuretic in reducing risk of some forms of CVD.

January 2003 —A study demonstrated that magnetic resonance imaging can detect heart attacks faster and more accurately than traditional methods in patients who arrive at an emergency room with chest pain.

February 2003—The NHLBI Prevention of Recurrent Venous Thromboembolism (PREVENT) trial was stopped because treatment with low-dose warfarin to prevent recurrence of the blood clotting disorders deep vein thrombosis and pulmonary embolism was found to benefit the patients.

May 2003—The NHLBI National Emphysema Treatment Trial found that lung volume reduction surgery benefits emphysema patients who have certain clinical characteristics. The findings will help determine the Medicare coverage policy for the surgery.

July 2003—The NHLBI and Gen-Probe Corporation developed a test to screen donated blood for the West Nile virus.

March 2004—Preliminary results of the NHLBI Sudden Cardiac Death in Heart Failure study demonstrated that an implantable cardiac defibrillator can reduce the risk of death from arrhythmia for heart failure patients.

August 2004—The NHBPEP Working Group on High Blood Pressure in Children and Adolescents released *The Fourth Report on the Diagnosis, Evaluation, and Treatment of High Blood Pressure in Children and Adolescents.*

An NHLBI-funded study showed that nucleic acid-amplification testing for HIV-1 and hepatitis C virus further safeguards the nation's blood supply.

October 2004—Researchers participating in the NHLBI Asthma Clinical Research Network demonstrated that genetic differences affect how adult patients with mild asthma respond, over time, to daily doses of inhaled albuterol (a drug used for relief of acute asthma symptoms).

November 2004—Results of the NHLBI Prevention of Events with Angiotensin Converting Enzyme Inhibition study demonstrated that many coronary heart disease patients who were receiving state-of-the art therapy do not gain extra cardiovascular protection from ACE inhibitors.

December 2004—The NHLBI Stroke Prevention Trial II showed that children with sickle cell disease who receive transfusions to prevent stroke revert to high risk for stroke when transfusions are stopped. STOP II was initiated after an earlier trial demonstrated that periodic red blood cell transfusions reduce the stroke rate by 90% among high-risk children with sickle cell disease.

January 2005—The NHLBI issued new guidelines for managing asthma during pregnancy.

February 2005—NHLBI-supported scientists identified 2 genetic mutations common in individuals of African descent that are associated with a 40% reduction in LDL cholesterol.

February 2006—Results from the WHI Calcium and Vitamin D trial showed that calcium and vitamin D supplements in healthy postmenopausal women provide a modest improvement in bone mass preservation and prevent hip fractures in certain groups including older women but do not prevent other types of fractures or colorectal cancer.

May 2006—Results from the Childhood Asthma Research and Education Network showed that daily treatment with inhaled corticosteroids can reduce breathing problems in pre-school-aged children at high risk for asthma, but does not prevent them from developing persistent asthma.

The Prospective Investigation of Pulmonary Embolism Diagnosis II found that the ability to diagnose pulmonary embolism is improved when a commonly used imaging test of the chest to detect potentially deadly blood clots in the lung is complemented by an extension of the scan to the legs—where the clots typically originate—or by a standard clinical assessment.

June 2006—The Should We Emergently Revascularize Occluded Coronaries for Cardiogenic Shock (SHOCK) trial showed that treating heart attack patients who have a life-threatening complication called cardiogenic shock with emergency angioplasty or bypass surgery greatly improves their long-term survival. Improved short-term survival was reported in 1999.

July 2006—NHLBI scientists found that a hormone called brain natriuretic peptide—or BNP, which can be detected in a simple blood test—can identify patients with sickle cell disease who have developed a life-threatening complication called pulmonary hypertension. The hormone is also a predictor of death in adult sickle cell patients.

Results from 2 randomized clinical trials demonstrated that inhaled nitric oxide administered within the first few weeks of life helps prevent chronic lung disease in some low birthweight premature infants. Moreover, when administered within 48 hours after birth, it appears to protect some premature newborns from brain injury.

September 2006—The NHLBI launched a peripheral arterial disease (PAD) awareness and education campaign entitled *Stay in Circulation...Take Steps to Learn about P.A.D.*

January 2007—The NHLBI launched the Learn More Breathe Better campaign to increase COPD awareness among primary care physicians and the public. View Image.

August 2007—The NAEPP issued the *Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma—Full Report 2007*, an update of the latest scientific evidence and recommendations for clinical practice on asthma care.

October 2007—NHLBI-supported researchers Mario Capecchi and Oliver Smithies were awarded the Nobel Prize in Physiology or Medicine for their creation of a gene-targeting technique that allows scientists to create mice that are genetically modified to develop human diseases.

December 2007—The NHLBI announced a new strategic plan to guide its next decade of research, training, and education.

January 2008—Results from the ALLHAT study demonstrated that in people with high blood pressure as part of metabolic syndrome, diuretics offer greater protection against cardiovascular disease and are at least as effective for lowering blood pressure as newer, more expensive medications.

February 2008—The NHLBI stopped one treatment arm of the Action to Control Cardiovascular Risk in Diabetes (ACCORD) clinical trial of adults with type 2 diabetes at high risk of heart attack and stroke after a review of available data showed that participants following a medical strategy to lower blood glucose below current recommendations to near-normal levels had an increased the risk of death compared with those receiving the standard treatment strategy.

The NHLBI issued the first U.S. guidelines for the diagnosis and management of von Willebrand Disease, the most common inherited bleeding disorder.

March 2008—The WHI Follow-up Study confirmed that the health risks of long-term combination hormone therapy outweigh the benefits for postmenopausal women. Researchers reported that about 3 years after women stopped taking combination hormone therapy, many of the health effects of hormones such as increased risk of heart disease are diminished, but overall risks of stroke, blood clots, and cancer remain high.

April 2008— Results from Stop Atherosclerosis in Native Diabetic Study (SANDS) showed that aggressively lowering cholesterol and blood pressure levels below current targets in adults with type 2 diabetes may help to prevent, and possibly reverse, hardening of the arteries**.**

August 2008—The NHLBI launched an educational Web site "Children and Clinical Studies," which features documentary videos, text, and graphics designed to promote a better understanding of research in children for health care professionals and the public.

December 2008—The NHLBI expanded its open-access dataset of genetic and clinical data to include information collected from three NHLBI-funded asthma research networks: CAMP, CARE, and ACRN.

Researchers identified a gene that directly affects the production of a form of hemoglobin that is instrumental in modifying the severity of SCD and thalassemia.

March 2009—Results from the STICH trial showed that surgery to reshape the scarred left ventricle, the main pumping chamber of the heart, often performed in conjunction with coronary bypass surgery, failed to reduce deaths and hospitalizations in heart failure patients and did not improve quality of life compared to bypass alone.

June 2009—Results from the BARI 2D study in patients with diabetes and stable coronary artery disease indicated that while revascularization can be delayed for many patients receiving optimal medical therapy, patients with extensive coronary artery disease do better with prompt bypass surgery than with medical therapy alone.

The NHLBI joined with UnitedHealth Group's Chronic Disease Initiative to launch a worldwide network of research and training centers to build institutional and community capacity to prevent and control chronic diseases globally.

NHLBI LEGISLATIVE CHRONOLOGY

June 16, 1948—The National Heart Act (Public Law 80-655) authorized NHI. The act's purpose was "To improve the health of the people of the United States through the conduct of researches, investigations, experiments, and demonstrations relating to the cause, prevention, and method of diagnosis and treatment of diseases of the heart and circulation; assist and foster such researches and other activities by public and private agencies, and promote the coordination of all such researches and activities and the useful application of their results; provide training in matters relating to heart diseases, including refresher courses for physicians; and develop, and assist States and other agencies in use of the most effective methods of prevention, diagnosis, and treatment of heart diseases."

December 30, 1963—House Joint Resolution 848 (P.L. 88-254) authorized and requested the President to issue an annual proclamation designating February as American Heart Month, inviting governors of states and territories to issue similar proclamations.

May 16, 1972—The National Sickle Cell Anemia Control Act (P.L. 92-294) established a national program for diagnosis, control, and treatment of and research in sickle cell anemia. The act did not mention NHLI but had special pertinence because NHLI was designated to coordinate the National Sickle Cell Disease Program.

September 19, 1972—The National Heart, Blood Vessel, Lung, and Blood Act of 1972 (P.L. 92-423) enlarged institute authority to advance the national attack on heart, blood vessel, lung, and blood diseases. The act provided for expanded, intensified, and coordinated institute activities in accordance with a comprehensive, specified National Heart, Blood Vessel, Lung, and Blood Disease Program to be planned by the director and the Advisory Council.

It also called for establishment of prevention and control programs; development of 15 new centers for basic and clinical research, training, demonstration, and prevention programs for heart, blood vessel, and blood diseases; and development of 15 such centers for chronic lung diseases.

June 25, 1976—Title I of the Health Research and Health Services Amendments of 1976 (P.L. 94-278) redesignated NHLI as NHLBI to advance the national attack on heart, blood vessel, lung, and blood diseases, and to conduct research in use of blood and blood products and in management of blood resources. The NHLBI director and the National Heart, Lung, and Blood Advisory Council continue to plan the national program under the basic P.L. 92-423 provisions with some refinements.

August 1, 1977—The Biomedical Research Extension Act of 1977 (P.L. 95-83) reauthorized NHLBI, with continued emphasis on both the national program and related prevention and dissemination activities.

December 17, 1980—The Health Programs Extension Act of 1980 (P.L. 96-538) reauthorized NHLBI, with continued emphasis on both the national program and related prevention programs.

January 4, 1983—The Orphan Drug Act (P.L. 97-414) amended the Public Health Service Act to mandate development and support of not less than 10 comprehensive centers for sickle cell disease.

November 20, 1985—The Health Research Extension Act (P.L. 99-158) reauthorized the NHLBI, provided for the establishment of information dissemination and education programs, and provided for an Associate Director for Prevention.

September 20, and **November 4, 1988**—The National Bone Marrow Donor Registry (P.L. 100-436, P.L. 100-607) was established. With enactment of these authorization and appropriation measures, NHLBI was given the task of developing an implementation plan for the voluntary bone marrow registry. Responsibility for the Registry later was transferred to the Health Resources and Services Administration.

June 10, 1993—The NIH Revitalization Act of 1993 (P.L. 103-43) established a National Center on Sleep Disorders Research within NHLBI.

October 31, 1998—Section 104 of the Women's Health Research and Prevention Amendments (P.L.105-340) instructed the NHLBI director to expand and intensify research and related activities of the institute with respect to heart attack, stroke, and other CVDs in women and to collaborate with other NIH institutes.

October 17, 2002—The Children's Health Act (P.L. 106-310) mandated that the Director of NHLBI, through the Coordinating Committee of the National Asthma Education and Prevention Program, develop a Federal plan for responding to asthma and recommended ways to strengthen coordination of Federal asthma-related activities.

BIOGRAPHICAL SKETCH OF NHLBI DIRECTOR GARY H. GIBBONS, M.D.

Gary H. Gibbons, M.D., is Director of the National Heart, Lung, and Blood Institute (NHLBI) at the National Institutes of Health (NIH), where he oversees the third largest institute at the NIH, with an annual budget of more than $3 billion and a staff of 917 federal employees.

The NHLBI provides global leadership for research, training, and education programs to promote the prevention and treatment of heart, lung, and blood diseases and enhance the health of all individuals so that they can live longer and more fulfilling lives.

Prior to being named director of the NHLBI, Gibbons served as a member of the National Heart, Lung, and Blood Advisory Council (NHLBAC) from 2009-2012. He was also a member of the NHLBI Board of Extramural Experts (BEE), a working group of the NHLBAC.

Before joining the NHLBI, Gibbons served as the founding director of the Cardiovascular Research Institute, chairperson of the Department of Physiology, and professor of physiology and medicine at the Morehouse School of Medicine, in Atlanta.

Under his leadership of the Cardiovascular Research Institute, Gibbons directed NIH-funded research in the fields of vascular biology, genomic medicine, and the pathogenesis of vascular diseases. During his tenure, the Cardiovascular Research Institute emerged as a center of excellence, leading the way in discoveries related to the cardiovascular health of minority populations. Gibbons received several patents for innovations derived from his research in the fields of vascular biology and the pathogenesis of vascular diseases.

Gibbons earned his undergraduate degree from Princeton University in Princeton, N.J., and graduated *magna cum laude* from Harvard Medical School in Boston. He completed his residency and cardiology fellowship at the Harvard-affiliated Brigham and Women's Hospital in Boston. Prior to joining the Morehouse School of Medicine in 1999, Gibbons was a member of the faculty at Stanford University in Stanford, Calif., from 1990-1996, and at Harvard Medical School from 1996-1999.

Throughout his career, Gibbons has received numerous honors, including election to the Institute of Medicine of the National Academies of Sciences; selection as a Robert Wood Johnson Foundation Minority Faculty Development Awardee; selection as a Pew Foundation Biomedical Scholar; and recognition as an Established Investigator of the American Heart Association (AHA).

NHLBI DIRECTORS

Name	In Office from	To
Cassius James Van Slyke	August 1, 1948	November 30, 1952
James Watt	December 1, 1952	September 10, 1961
Ralph E. Knutti	September 11, 1961	July 31, 1965
William H. Stewart	August 1, 1965	September 24, 1965
Robert P. Grant	March 8, 1966	August 15, 1966
Donald S. Frederickson	November 6, 1966	March 1968
Theodore Cooper	March 15, 1968	April 19, 1974
Robert I. Levy	September 16, 1975	June 1981
Claude Lenfant	July 1, 1982	September 2, 2003
Elizabeth G. Nabel	February 1, 2005	November 30, 2009
Susan B. Shurin (Acting)	December 1, 2009	August 10, 2012
Gary H. Gibbons	August 13, 2012	Present

NHLBI PROGRAMS

The NHLBI is organized into the Extramural Research Program, the Intramural Research Program, and the Office of the Director.

The Office of the Director

The Office of the Director (OD) of the National Heart, Lung, and Blood Institute (NHLBI) provides overall strategic planning, policy guidance, program development and evaluation, and operational and administrative coordination for the Institute. Offices within the OD provide critical management and administrative support to the Institute, and are responsible for the transparent and responsible stewardship of the NHLBI budget.

The OD is the focal point of relationships with the Director of the NIH as well as with other components of the Department of Health and Human Services (DHHS), other Federal agencies, Congress, professional societies, voluntary health organizations, and other public groups. The OD advises and guides the NHLBI's key leaders on the principles, practices, laws, regulations, and policies of the Federal equal employment, affirmative action, civil rights, and minority programs.

The OD collects, develops, and disseminates information on the diseases of the heart, lung, and blood and on transfusion medicine, with an emphasis on disease prevention, and conducts and fosters educational programs for scientists and clinicians. It provides leadership in the transfer and assessment of information for the scientific community and the lay public, and establishes internal Institute policy for program and administrative operations, maintaining surveillance over their implementation.

Office of Management

The NHLBI Office of Management (OM) provides oversight and consultation on the business and administrative management operations of the Institute. Areas under the purview of the OM include: budget formulation and execution; human resource management; administrative policy and procedures development and oversight;

Freedom of Information and Privacy Act compliance; space management; and travel and procurement services for the Office of the Director components.

The Center for Biomedical Informatics

The Center for Biomedical Informatics (CBI) supports and provides leadership for the Institute for all aspects of biocomputing. CBI supports the Institute's information technology (IT), encompassing strategic planning, project management, and developing enterprise systems. The office oversees the continuous operations of the IT infrastructure, including new network development, user and network support, and information security. CBI also maintains and develops IT systems and databases for tracking and reporting of extramural and intramural programs. CBI recommends and implements IT policies and procedures; studies, evaluates and tests new technologies (hardware, software, and information systems); designs methods to communicate with all NHLBI stakeholders; and develops new methods for managing knowledge in addition to developing an information architecture for the Institute.

The Center for Population Studies

The NHLBI Center for Population Studies formulates a global view of the etiology, natural history, and time-period trends in heart, lung, blood, and sleep disorders. The Center performs collaborative studies of heart, lung, blood and sleep disorders; and conducts state-of-the-art research of these conditions with attention to early onset of these disorders as well as genetic susceptibility. In addition, the Center has launched a systems medicine project known as the SABRe CVD Initiative (Systems Approach to Biomarker Research in Cardiovascular Disease) in which researchers will obtain metabolomic, proteomic, gene expression, and microRNA data on thousands of study participants in an effort to identify molecular signatures of disease phenotypes in the population setting.

The Office of Research Training and Minority Health (ORTMH)

The Office of Research Training and Minority Health (ORTMH) was established by the National Heart, Lung, and Blood Institute (NHLBI) effective July 1, 2002. The office has an overall mission to provide leadership and oversight of the NHLBI extramural research training and career development programs and policies, including an emphasis on the elimination of health disparities through research and training of a future diverse research workforce. The office develops, implements, and evaluates IC policies and procedures for research, training, and career development awards; (2) provides leadership, coordination, and/or oversight responsibility of information concerning the NHLBI's programs, policies, and procedures to the biomedical research training community; and (3) provides and coordinates targeted programs including efficient utilization of existing mechanisms and data resources to address research training, manpower, and research priorities, such as inclusion of minorities in research studies and ensuring a diverse research workforce. In addition, the office is the Institute's focal point for advice and guidance on matters pertaining to minority health and minority participation in research, including identifying gaps and needs as well as opportunities to address them. It provides leadership, coordination, and oversight for an NHLBI-wide strategic plan to improve research for minority and health disparity populations on diseases and conditions that affect these groups disproportionately; (2) develops and promotes strategies for outreach to improve minority enrollment in clinical studies; and (3) promotes effective dialogue between researchers and trainees, including those in minority and health disparity communities, by establishing professional, community and/or mentoring networks important in communication with various population groups.

The Office of Science and Technology (OST)

The Office of Science and Technology (OST) at the NHLBI provides support to the Institute's Director and Institute Divisions and Offices. It establishes goals and implements procedures and policies to accomplish them, conducts program analysis, develops reports on Institute activities, and coordinates the Institute's technology transfer function. The OST is comprised of four programs: Program Studies and Reports; Science and Special Issues; Public Liaison; and Technology Transfer and Development.

The Office of Communications (OC)

The NHLBI Office of Communications provides a comprehensive, integrated, and technology-supported communications capability for all matters relating to the communication of the Institute's vision, Strategic Plan, and mission oriented program activities and accomplishments to internal and external audiences; initiates, develops, and implements a dynamic, proactive, communications program appropriate for intended audiences; involves multiple groups on a national and international level and leverages the communications resources of local, national, and international sources including audience-specific interest groups; evaluates the effectiveness of communications activities; and coordinates and integrates activities of the Public Affairs and the Health Campaigns & Consumer Services Branches.

Public Affairs Branch

The Public Affairs Branch implements and maintains mutual communications between the NHLBI and the general public and internal and external audiences; maintains the Director's, NHLBI Newsroom, and the American Recovery and Reinvestment Act and Strategic Plan Web sites; acts as event coordinator; oversees media relations; and advances the public face of the NHLBI.

Health Campaigns & Consumer Services Branch

The Health Campaigns and Consumer Services Branch utilizes the latest health and consumer communications, behavioral and social marketing research in planning communications strategies; develops consumer messages and public education campaigns for COPD, women and heart disease, and sickle cell disease; provides consulting services for printing, graphic design and publication layout, and provides support for NHLBI exhibits, product marketing and printed media and provides clearance support for the NHLBI's print and Web-based publications, ensuring the Institute's disseminations meet the NIH and the HHS clearance requirements.

Office of Communications (OC)
National Heart, Lung, and Blood Institute
ATTN: Web Site Inquiries
31 Center Drive, MSC 2480
Bethesda, Maryland 20892-2480

Phone numbers are available in the Abbreviated Staff Directory.

Extramural Research Program

NHLBI extramural research programs are implemented through 3 scientific units—the Division of Cardiovascular Sciences, the Division of Lung Diseases, and the Division of Blood Diseases and Resources—and a service unit, the Division of Extramural Research Activities. Additionally, the Division for the Application of Research Discoveries focuses on translation, dissemination, and utilization of research findings. Research grants, program project grants, specialized center grants, cooperative agreements, research contracts, research career development awards, and institutional and individual national research service awards are used to support research, research training, and career development.

Division of Cardiovascular Sciences (DCVS)

DCVS provides leadership and supports basic, clinical, population, and health services research on the causes, prevention, and treatment of cardiovascular diseases. DCVS represents the union of two previously existing divisions, the Division of Cardiovascular Disease (DCVD) and the Division of Prevention and Population Sciences (DPPS).

The Division fosters research in disease areas, such as atherothrombosis, heart attack and heart failure, high blood pressure, stroke, atrial and ventricular arrhythmias, sudden cardiac death, adult and pediatric congenital heart disease, cardiovascular complications of diabetes and obesity, and other cardiovascular disorders. Technology development for the diagnosis and treatment of cardiovascular disorders is also supported. Research also includes a number of well-known epidemiological cohort studies that describe disease and risk factor patterns in populations; clinical trials of interventions to prevent disease and to prevent or modulate risk factors; studies of genetic, behavioral, sociocultural, health systems, and environmental influences on disease risk and outcomes; and studies of the application of prevention and treatment strategies to determine how to improve clinical care and public health. The Division supports training and career development for these areas of research. In addition to the Office of the Director, the Division is organized operationally as 3 Offices and 3 Programs that oversee 8 Branches.

- Office of Research Training and Career Development
- Office of Biostatistics Research
- Office of Special Projects
- Program in Basic and Early Translational Research
- Vascular Biology and Hypertension Branch
- Advanced Technologies and Surgery Branch
- Program in Adult and Pediatric Cardiac Research
- Heart Failure and Arrhythmias Branch
- Heart Development and Structural Diseases Branch
- Atherosclerosis and Coronary Artery Diseases Branch
- Program in Prevention and Population Sciences
- Epidemiology Branch
- Clinical Applications and Prevention Branch
- Women's Health Initiative Branch

Office of Research Training and Career Development

The Office of Research Training and Career Development supports training and career development programs in cardiovascular research, offering opportunities to individuals at all educational levels from high school students to academic faculty, including programs for individuals from diverse populations. The programs promote opportunities for investigators, early in their research careers and under mentorship from senior scientists, to perform basic, preclinical or clinical cardiovascular research and to take emerging and promising scientific and technological advances from discovery through preclinical and clinical studies. The Office also collaborates with the scientific community and professional organizations to ensure that training programs meet both the current and future needs of the cardiovascular research workforce. Programs supported by the Office include:

- Institutional and individual research training programs and fellowships for training of promising cardiovascular scientists at the predoctoral, postdoctoral, junior faculty, and established investigator levels.
- Diversity Supplements to ongoing research grants for support of young investigators from diverse backgrounds, from the high school to the junior faculty level.
- The Pathway to Independence Program, which allows the recipient to bridge the gap between a career development award and a research award.
- Career development programs specifically designed for clinical research or for minority researchers and institutions.

Office of Biostatistics Research

The Office of Biostatistics Research (OBR) provides statistical expertise to members of all Divisions of the NHLBI and performs diverse functions in planning, designing, implementing and analyzing NHLBI-sponsored studies. The OBR has primary responsibility for providing objective, statistically sound, and medically relevant solutions to problems. When presented with a problem for which techniques are not yet available, the OBR is expected to provide a new and valid

statistical solution. The OBR is concerned with designing efficient studies and monitoring data while studies are ongoing. All members of the professional staff have interests in statistical methodology relevant to clinical research studies. The OBR's methodological interest concern survival analysis, longitudinal data analysis, and efficient study designs, including the monitoring of ongoing clinical studies for efficacy and safety. Recently the OBR has made contributions to statistical genetics and has extended its expertise to bioinformatics.

Office of Special Projects

The Office of Special Projects will represent the DCVS on NHLBI and NIH policy committees, oversee and work with Division leadership on selected activities of the DCVS clinical studies portfolio, foster communication within DCVS by developing and/or coordinating Division-wide and Institute-wide interest groups on various topics, develop and implement specific cross-cutting projects, and provide expert consultation as needed for the larger-scale projects or initiative development.

Program in Basic and Early Translational Research

The Program supports and provides leadership for basic, pre-clinical and early translational studies on vascular biology and hypertension, cardiovascular surgery, and the development of advanced technologies for the diagnosis and treatment of cardiovascular diseases. The portfolio includes an integrated basic and clinical research program studying the biological basis for vascular diseases and hypertension, and their diagnosis, treatment and prevention. Research on cardiovascular surgery includes both basic and pre-clinical research on surgical approaches, and clinical trials to establish evidence-based surgical therapies. The development of diagnostics encompasses research on biosensors, imaging technologies, and the application of “omic” methodologies. Therapeutic development includes drug and nucleic acid delivery technologies, regenerative and reparative medicine, gene therapy, and device development. The Program also supports training and career development for these areas of research. The Program is divided into two branches: the Vascular Biology and Hypertension Branch, and the Advanced Technologies and Surgery Branch.

Program in Adult and Pediatric Cardiac Research

The Program supports and provides leadership for basic, translational, and clinical research on the development, maturation, and functioning of the heart throughout all stages of life. The research portfolio includes a broad array of science including cardiac development and maturation, myocyte structure and function, myocardial energetics and metabolism, cardiac electrophysiology, coronary artery structure and function, the failing heart, valvular heart disease, exercise physiology, nutrition and the heart, congenital heart disease from birth through adulthood, the intrauterine environment and cardiovascular risk, cardiomyopathy, and coronary artery disease. A key function of the Program is to provide collaborative leadership for the systematic oversight of clinical research across the Division, including clinical research information technology and standard but flexible operating procedures. The Program also supports training and career development for these areas of research. The Program is organized into three major components: the Heart Failure and Arrhythmias Branch, the Heart Development and Structural Diseases Branch, and the Atherosclerosis and Coronary Artery Diseases Branch.

Program in Prevention and Population Sciences

The Program of Prevention and Population Sciences supports and provides leadership for population- and clinic-based research on the causes, prevention, and clinical care of cardiovascular, lung, and blood diseases and sleep disorders. Research includes a broad array of epidemiological studies to describe disease and risk factor patterns in populations and to identify risk factors for disease; clinical trials of interventions to prevent disease; studies of genetic, behavioral, sociocultural, and environmental influences on disease risk and outcomes; and studies of the application of prevention and treatment strategies to determine how to improve clinical care and public health. The Program also supports training and career development for these areas of research. The Program is organized into three major components: the Epidemiology Branch, the Clinical Applications and Prevention Branch, and the Women's Health Initiative Branch.

Division of Lung Diseases (DLD)

The DLD plans and directs a coordinated research program on the causes and progression of lung diseases and sleep disorders including their prevention, diagnosis, and treatment. It supports basic research, clinical trials, national pulmonary centers, technological development, and application of research findings. Activities focus on understanding the structure and function of the respiratory system, increasing fundamental knowledge of mechanisms associated with pulmonary disorders, and applying new findings to evolving treatment strategies for patients. The DLD, through the National Center on Sleep Disorders Research, also coordinates sleep research activities across the NIH, other Federal agencies, and outside organizations.

The Division is organized into 2 branches and 1 center:

- Airway Biology and Disease Branch
- Lung Biology and Disease Branch
- National Center on Sleep Disorders Research

The *Airway Biology and Disease Branch* supports research and research training in asthma, COPD, cystic fibrosis, and airway function in health and disease. Basic research focuses on elucidating the etiology and pathophysiology of the diseases. Clinical studies focus on improving asthma management and reducing health disparities in asthma, improving COPD treatment and management, and developing genetic, pharmacologic, and nonpharmacologic (e.g., gene transfer) treatments for cystic fibrosis.

The *Lung Biology and Disease Branch* supports research, education, and training programs in lung cell and vascular biology; developmental biology and pediatric lung diseases; acute lung injury and critical care medicine; and interstitial lung diseases and lung immunology including pulmonary fibrosis, sarcoidosis, and pulmonary manifestations of HIV/AIDS and associated infections with emphasis on active and latent tuberculosis (TB) and drug-resistant TB. Basic research focuses on lung development and cell biology, including stem cell biology and cell-based therapies, and mechanisms of disease etiology and pathogenesis. Clinical studies focus on evaluating innovative therapies for acute lung injury and acute respiratory distress syndrome, pulmonary fibrosis, neonatal lung disease, pulmonary embolism, and pulmonary hypertension.

The *National Center on Sleep Disorders Research* plans, directs, and supports basic, clinical, and applied research, health education, training, and prevention research in sleep, chronobiology, and sleep disorders. It oversees developments in its program areas; assesses the national needs for research on causes, diagnosis, treatment, and prevention of sleep disorders and sleepiness; and coordinates sleep research activities across the Federal government and with professional, voluntary, and private organizations.

The NHLBI sleep research program seeks to understand the molecular, genetic, and physiological regulation of sleep and the relationship of sleep disorders to cardiovascular diseases. It also supports efforts to understand the relationships of sleep restriction and sleep-disordered breathing to the metabolic syndrome, including obesity, high blood pressure and stroke, dyslipidemia, insulin resistance, and vascular inflammation.

Division of Blood Diseases and Resources (DBDR)

The DBDR plans and directs research and research training on the causes and prevention of blood diseases and disorders. Areas of interest encompass a broad spectrum of research from stem cell biology to medical management of blood diseases, with a focus on nonmalignant and premalignant processes. The DBDR has recently taken a leading role in developing cell-based therapies, combining the expertise of transfusion medicine and stem cell technology with the exploration of repair and regeneration of human tissues and biological systems. The Division also has a major responsibility to improve the adequacy and safety of the Nation's blood supply.

The Division is organized into 3 branches:

- Blood Diseases Branch
- Thrombosis and Hemostasis Branch
- Transfusion Medicine and Cellular Therapeutics Branch

The *Blood Diseases Branch* supports research and research training in nonmalignant disorders of the hematopoietic system including sickle cell disease and thalassemia. Attention is focused on reducing morbidity and mortality caused by the disorders and preventing their occurrence. The Branch oversees a program of Comprehensive Sickle Cell Centers, which collectively form a sickle cell disease clinical research network—and which individually conduct basic and clinical research—and provide state-of-the-art patient care, educational activities for patients and health professionals, community outreach, and genetic counseling services. A thalassemia clinical network is evaluating new treatment strategies and ensuring that research findings on optimal management of the disease are rapidly disseminated to practitioners and health care professionals.

The *Thrombosis and Hemostasis Branch* supports research and research training in hemostasis, thrombosis, and endothelial cell biology. It oversees a comprehensive program of basic research, clinical studies, and technology development focusing on understanding the pathogenesis of both arterial and venous thrombosis in order to improve the diagnosis, prevention, and treatment of thrombosis in heart attack, stroke, and peripheral vascular diseases. The Branch also supports research on bleeding disorders (e.g., hemophilia and von Willebrand Disease) and immune disorders (e.g., idiopathic thrombocytopenic purpura, thrombotic thrombocytopenic purpura, and systemic lupus erythematosus).

The *Transfusion Medicine and Cellular Therapeutics Branch* plans and directs research and research training in transfusion medicine, stem cell biology and disease, and clinical cellular medicine. It supports research on the use, safety, and availability of blood and blood components for transfusion and cellular therapies. The Branch also develops programs for basic and clinical research related to normal and abnormal cellular biology and pathology. In addition, it collaborates with governmental, private sector, and international organizations to improve the safety and availability of the global supply of blood and blood components.

Division of Extramural Research Activities (DERA)

The DERA provides a number of services to the Institute. For example, it represents the Institute on overall NIH committees on extramural program policies and oversees compliance with such policies within the NHLBI. It also provides grant and contract management services to the Institute's program divisions, and provides initial scientific merit review of some research grant applications (e.g., applications submitted in response to an Institute Request for Applications, RFA). In addition, the DERA coordinates the Institute's Committee Management Activities and the meetings of the National Heart, Lung, and Blood Advisory Council.

Division for the Application of Research Discoveries (DARD)

The DARD provides leadership for the vigorous pursuit of excellence in national as well as international research translation, dissemination, and utilization programs to speed the application of scientific advances in the prevention, detection, and treatment of cardiovascular, lung, and blood diseases and narrow the discovery-delivery gap. Through knowledge networks, education programs, community outreach, conferences, and symposia, provides opportunities for multidirectional communication and collaboration among researchers, clinical and public health practitioners, patients, and the general public. (1) Connects research and practice in a continuous learning loop; (2) identifies knowledge gaps that should be addressed by future research; (3) enables rapid translation of emergent knowledge by synthesizing and organizing evidence around priority diseases and conditions; (4) facilitates knowledge-sharing and collaboration with key stakeholder groups; and (5) reaches out to people in high risk, low-income, and minority communities to eliminate health disparities.

Office of the Director

(1) Plans, coordinates, and manages activities of all DARD subdivisions; (2) fosters and coordinates inter-NHLBI and interagency collaborative national and international research translation, dissemination and utilization activities, and knowledge network activities; (3) develops and maintains the necessary technical management capability to foster and guide effective national and international research translation, dissemination, utilization, and communication programs; and (4) provides administrative and crosscutting technical support and coordination to achieve NHLBI strategic planning goals and objectives.

Research Translation Branch

(1) Manages emergent knowledge for rapid translation through more effective approaches to synthesize and organize evidence around priority diseases and conditions; (2) identifies knowledge gaps for informing future research opportunities; (3) promotes the use of evidence-based reviews and developing or facilitating the development of clinical guidelines with relevant stakeholders; (4) develops clinical decision support and other innovative implementation applications for use in clinical and public health practice settings; and (5) facilitates knowledge exchange opportunities for researchers and users of research to discuss issues of research applicability, relevance, and utility to inform future research needs and opportunities through knowledge networks and other strategies.

Enhanced Dissemination and Utilization Branch

(1) Collects, synthesizes, and communicates new knowledge and recommendations for dissemination and utilization of research-based findings to diverse target audiences including minority and underserved groups; (2) provides technical assistance and information resources to enhance NHLBI grantees' dissemination plans and practices; (3) accelerates the speed with which evidence-based tools, and education programs move into community practice settings through best practice strategies in research dissemination and utilization; (4) establishes community-based Enhanced Dissemination and Utilization Centers committed to applying and evaluating the impact of the latest research advances in multiple settings to achieve DHHS Healthy People Goals and to eliminate health disparities; and (5) conducts data analysis to inform program planning and evaluate the impact of dissemination and utilization activities.

Intramural Research Program

Division of Intramural Research (DIR)

The DIR conducts laboratory and clinical research in heart, vascular, lung, blood, and kidney diseases and develops technology related to cardiovascular and pulmonary diseases.

The DIR is organized into 4 centers and 3 branches:

- Biochemistry and Biophysics Center
- Cell Biology and Physiology Center
- Genetics and Development Biology Center
- Immunology Center
- Translational Medicine Branch
- Hematology Branch
- Pulmonary and Vascular Medicine Branch

The *Biochemistry and Biophysics Center* studies the molecular basis of structure–function relationships of proteins and biologically relevant molecules. It performs state-of-the-art studies of protein structure and functional interactions, develops mathematical tools for generating models of protein structure–function relationships, elucidates mechanisms of enzyme function, and investigates relationships between protein structure–function and cell signaling pathways.

The *Cell Biology and Physiology Center* studies mechanisms that regulate cellular function and physiology. It evaluates mechanisms that control different molecular machines within the cytosol, including those involved in muscle contraction, and cytosolic and membrane transport processes. The Center studies cellular signaling events associated with hormone action, cytosolic trafficking, and energy metabolism; investigates the role of cellular processes on function and adaptation in whole animal model systems; and develops unique measuring devices for studying biochemical and physiological processes in intact cells, whole animals, and clinical situations.

The *Genetics and Development Biology Center* studies mechanisms that regulate cardiovascular development and the etiology of congenital heart anomalies and cardiovascular disease. It evaluates the function of specific genes and transcription factors in the development of the heart and other tissues, develops techniques and approaches for gene delivery and gene therapy, and investigates processes that regulate and interpret the genetic code in development and disease.

The *Immunology Center* studies intracellular and signaling processes involved in the activation of lymphocytes and mast cells, investigates mechanisms by which drugs and other agents result in allergic-autoimmune reactions, and applies the results to the development of diagnostic and therapeutic approaches.

The *Translational Medicine Branch* conducts biomedical research directed at defining at the molecular level, normal and abnormal biologic function. It develops diagnostic and therapeutic modalities for the treatment and understanding of cardiovascular disease and implements mechanism-based clinical studies.

The *Hematology Branch* investigates normal and abnormal hematopoiesis. It focuses on bone marrow failure, viral infections of hematopoietic cells, gene therapy of hematologic and malignant diseases, bone marrow transplantation, and mechanisms of immunologically mediated syndromes like graft-versus-host disease and autoimmune diseases.

The *Pulmonary and Vascular Medicine Branch* conducts research on the lung, heart, and systemic vasculature directed at defining—at the molecular, biochemical, and functional levels—normal physiological function and novel mechanisms of disease.

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Recent Photos from the National Heart, Lung, and Blood Institute (NHLBI)

2009 PHOTOS

NHLBI Program Director Dr. Cristina Rabadán-Diehl greets Centers of Excellence representatives from around the globe, UnitedHealth Group members, scientific advisors, and NHLBI staff, including Acting Director Susan B. Shurin, M.D., on December 16, 2009 in Bethesda, Md.
lo-res | hi-res

Students from Umana Middle School Academy and their principal, Jose Salgado, Ed.D., playing at a **We Can!** event held at the Boston Children's Museum's Kid Power exhibit.
lo-res

2007 PHOTOS

NHLBI Director Dr. Elizabeth G. Nabel speaks at the January 2007 launch of the NHLBI's Learn More Breathe Better campaign to raise awareness of chronic obstructive pulmonary disease. Photo courtesy of NHLBI.
lo-res | hi-res

At a November 2007 news conference, Ivonne Borrero, mother of 2, describes how the We Can! parents' program has helped her family learn to eat healthier and be more physically active. We Can! (Ways to Enhance Children's Activity and Nutrition) is a science-based national education program developed by NHLBI to help children ages 8 to 13 stay at a healthy weight by improving food choices, increasing physical activity, and reducing recreational screen time. The news conference announced the expansion of We Can! through a partnership with the Association of Children's Museums. Additional speakers (pictured, left to right) included Dr. Elias Zerhouni, NIH Director; Dr. Steven K. Galson, Acting U.S. Surgeon General; Lou Casagrande, president and CEO of Boston Children's Museum, which hosted the event. Photo by Les Veilleux Photography.
lo-res | hi-res

This page last reviewed on February 24, 2011

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

NIH...Turning Discovery Into Health®

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

National Human Genome Research Institute

Mission | Important Events | Director | Major Programs

MISSION

In January 2007, the National Human Genome Research Institute (NHGRI) celebrated its 10th anniversary as an institute of the National Institutes of Health (NIH), marking a decade that saw genomics emerge as a powerful research tool and looking ahead to an era in which genomics will transform medical care.

NHGRI, established originally as the National Center for Human Genome Research in 1989, led the NIH's contribution to the International Human Genome Project. The project, which had as its primary goal the sequencing of the 3 billion DNA letters that make up the human genetic instruction book, was successfully completed in April 2003.

NHGRI's mission has evolved over the years to encompass a broad range of studies aimed at understanding the structure and function of the human genome and its role in health and disease. To that end, the institute supports the development of resources and technology that will accelerate genome research and its application to human health. A critical part of NHGRI's mission continues to be the study of the ethical, legal and social implications (ELSI) of genome research. NHGRI also supports the training of investigators, as well as the dissemination of genome information to the public and to health professionals.

NHGRI is organized into three main divisions: the Office of the Director, which provides guidance to scientific programs and oversees the general operation of the institute; the Division of Extramural Research, which supports and administers the role of NIH in genomic research; and the Division of Intramural Research, which is home to the institute's in-house, genetics research laboratories.

Research guidance and guidance related to NHGRI grants comes from the National Advisory Council for Human Genome Research, which meets three times a year, usually in Bethesda, MD. Members include representatives from health and science disciplines, public health, social sciences and the general public. Portions of the council meetings are open to the public.

IMPORTANT EVENTS IN NHGRI HISTORY

August 1988—Program advisory committee on the human genome is established to advise the NIH on all aspects of research in the area of genomic analysis.

October 1988—The Office for Human Genome Research is created within the NIH Office of the Director. Also, NIH and the Department of Energy (DOE) sign a memorandum of understanding outlining plans for cooperation on genome research.

February 1988—NIH Director James Wyngaarden assembles scientists, administrators and science policy experts in Reston, VA, to lay out an NIH plan for the Human Genome Project (HGP).

January 1989—The program advisory committee on the human genome holds its first meeting in Bethesda, MD.

October 1989—The National Center for Human Genome Research (NCHGR) is established to carry out the NIH's component of the HGP.

April 1990—The five-year plan with specific goals for the project is published.

May 1990—The National Advisory Council for Human Genome Research (NACHGR) is established.

July 1990—The genome research review committee is created so the center could conduct appropriate peer review of human genome grant applications.

October 1990—The HGP officially begins.

January 1991—The NACHGR meets for the first time in Bethesda, MD.

April 1992—James Watson resigns as first director of the NCHGR. Michael Gottesman is appointed acting center director.

February 1993—The center's Division of Intramural Research (DIR) is established.

April 1993—Francis S. Collins is appointed NCHGR director.

October 1993—The Human Genome Project revises its five-year goals through September 1998.

September 1994—Human genetic mapping goal achieved one year ahead of schedule.

November 1995—NCHGR celebrates its fifth anniversary. J.D. Watson Lecture is established.

April 1995—Task Force on Genetic Testing established as a subgroup of the NIH-DOE Ethical, Legal and Social Implications (ELSI) working group.

April 1996—Human DNA sequencing begins with pilot studies at six U.S. universities.

April 1996—An international team completes DNA sequence of first eukaryotic genome, *Saccharomyces cerevisiae*, or common brewer's yeast.

September 1996—Center for Inherited Disease Research (CIDR), a project co-funded by eight NIH institutes and centers to study the genetic components of complex disorders, is established on the Johns Hopkins Bayview Medical Center campus in Baltimore.

October 1996—Scientists from government, university and commercial laboratories around the world reveal a map that pinpoints the locations of more than 16,000 genes in human DNA.

November 1996—NCHGR and other researchers identify the location of the first gene associated with Parkinson's disease.

November 1996—NCHGR and other researchers identify the location of the first major gene that predisposes men to prostate cancer.

December 1996—Report issued by the Joint NIH/DOE Committee evaluating the ELSI program of the HGP.

January 1997—Department of Health and Human Services Secretary Donna E. Shalala signs documents giving NCHGR a new name and new "status" among other research institutes at NIH. The new name, the National Human Genome Research Institute (NHGRI), more accurately reflects its growth and accomplishments. As an institute, NHGRI can more appropriately interact with other federal agencies and share equal standing with other institutes at NIH.

March 1997—Government-citizen group suggests policies to limit genetic discrimination in the workplace.

May 1997—NHGRI and other scientists show that three specific alterations in the breast cancer genes *BRCA1* and *BRCA2* are associated with an increased risk of breast, ovarian and prostate cancers.

June 1997—NHGRI scientists precisely identify a gene abnormality that causes some cases of Parkinson disease.

July 1997—A map of human chromosome 7 is completed.

December 1997—NHGRI and other researchers identify an altered gene that causes Pendred syndrome.

March 1998—Vice President Al Gore announces that the Clinton administration is calling for legislation to bar employers from discriminating against workers in hiring or promotion because of their genetic makeup.

September 1998—At a meeting of the HGP's main advisory body, project planners present a new plan to produce a "finished" version of the DNA sequence of the human genome by the end of year 2003, two years ahead of its original schedule. The HGP plans to generate a "working draft" that, together with the finished sequence, will cover at least 90 percent of the genome in 2001. The "working draft" will be immediately valuable to researchers and form the basis for a high-quality, "finished" genome sequence.

September 1998—A major international collaborative research study finds on the X chromosome the site of a gene for susceptibility to prostate cancer; this is the first time a gene for a common type of cancer is mapped to the X chromosome.

October 1998—NIH and DOE develop a new five-year plan for the HGP. This plan, published in the October 23, 1998, issue of the journal *Science*, is designed to carry the project forward for the next five years, fiscal years 1999 through 2003.

December 1998—The genome of the tiny roundworm *Caenorhabditis elegans*, is sequenced by NHGRI and other HGP-funded scientists.

March 1999—Large scale sequencing of the human genome begins.

September 1999—Scientists confirm they are on schedule to produce the "working draft" of the genetic blueprint of humankind by spring of 2000.

October 1999—President Bill Clinton and First Lady Hillary Rodham Clinton host the eighth Millennium Evening at the White House. The program is titled "Informatics Meets Genomics."

November 1999—NHGRI hosts the first annual "Consumer Day" conference to inform patients, families and health care providers about the impact of the HGP.

November 1999—NHGRI, DOE and Wellcome Trust hold a celebration of the completion and deposition into GenBank of 1 billion base pairs of the human genome

DNA sequence.

December 1999—NHGRI and other HGP-funded scientists unravel for the first time the genetic code of an entire human chromosome. The findings are reported in the December 2 issue of *Nature*.

February 2000—President Clinton signs an Executive Order to prevent genetic discrimination in the federal workplace.

March 2000—Public consortium of scientists and a private company release a substantially complete genome sequence of the fruitfly *Drosophila melanogaster*. The journal *Science* publishes the findings.

April 2000—The NHGRI, the NIH Office of Rare Disease Research and the Don and Linda Carter Foundation sponsor the first NIH Conference on Holoprosencephaly.

May 2000—Scientists in Japan and Germany report in *Nature* that they have unraveled the genetic code of human chromosome 21, already known to be involved with Down syndrome, Alzheimer's disease, Usher syndrome and Amyotrophic Lateral Sclerosis, also known as Lou Gehrig's disease.

June 2000—The HGP announces a major milestone: it has assembled 85 percent of the sequence of the human genome – the genetic blueprint for a human being.

August 2000—Scientists discover a genetic "signature" that may help explain how malignant melanoma, a deadly form of skin cancer, can spread to other parts of the body. Findings are reported in the journal *Nature*.

October 2000—The NIH, the Wellcome Trust and three private companies collaborate to form the Mouse Sequencing Consortium to accelerate the sequencing of the mouse genome.

October 2000—The HGP is the recipient of the American Society of Human Genetics' Allan Award to honor the hundreds of scientists involved in deciphering the human genetic code.

November 2000—NHGRI hosts its second annual "Consumer Day."

January 2001—The ELSI Research Programs of NHGRI and the U.S. Department of Energy cosponsor a conference to celebrate a decade of research and consider the impact of the new science on genetic research, health and policy.

February 2001—The HGP publishes a series of scientific papers in the journal *Nature*. The papers, provide the first analysis of the human genome sequence, describing how it is organized and how it evolved. The analysis reveals that the human genome only contains 30,000 to 40,000 genes, far fewer than the 100,000 previously estimated.

February 2001—NHGRI scientists use microarray technology to develop a gene test that differentiates hereditary and sporadic breast cancer types. The *New England Journal of Medicine* publishes the findings.

March 2001—NHGRI and HGP-funded scientists find a new tumor suppressor gene on human chromosome 7 that is involved in breast, prostate and other cancers. A single post-doc, using the "working draft" data, is able to pin the gene down in weeks. In the past, the same work would have taken several years and contributions from many scientists.

May 2001—The Mouse Genome Sequencing Consortium announces it has achieved three-fold coverage of the mouse DNA sequence. The publicly available data represents 95 percent of the mouse sequence, and can be used to uncover human genes by comparing the genomes of mouse and human to each other.

May 2001—Researchers from NHGRI and Sweden's Lund University develop a method of accurately diagnosing four complex, hard-to-distinguish childhood cancers using microarray technology and artificial neural networks. *Nature Medicine* publishes the results.

September 2001—NHGRI creates the Centers for Excellence in Genomic Sciences (CEGS) program, which supports the formation of interdisciplinary research teams that develop innovative genomic research projects using the data sets and technologies developed by the HGP. The initial CEGS grants are awarded to the University of Washington and Yale University.

November 2001—NHGRI co-sponsors a forum, entitled The Human Genome Project: The Challenges and Impact of Human Genome Research for Minority Communities, to inform the public, students and healthcare providers in minority communities about the scientific advances and the ethical, legal and societal impacts of the HGP.

December 2001—NHGRI holds a planning conference, called Beyond the Beginning: The Future of Genomics, at the Airlie Conference Center in Warrenton, VA, to develop a broad vision for the future of genomics research.

January 2002—NHGRI scientists and collaborators at Johns Hopkins Medical Institutions in Baltimore and The Cleveland Clinic identify a gene on chromosome 1 that is associated with an inherited form of prostate cancer in some families. *Nature Genetics* publishes the findings.

February 2002—NHGRI and the NIH Office of Rare Diseases launch a new information center to provide accurate, reliable information about genetic and rare diseases to patients and their families.

May 2002—The Mouse Genome Sequencing Consortium releases a working draft assembly of the mouse genome, which is made freely available in public databases.

May 2002—NHGRI prioritizes the next set of model organisms to sequence as capacity becomes available. They include chicken, chimpanzee, several species of fungi, a sea urchin, the honeybee and a microscopic animal commonly used in laboratory studies called *Tetrahymena*.

July 2002—NHGRI awards two new Centers for Excellence in Genomic Sciences grants to Stanford University and the Molecular Sciences Institute, Berkeley, CA.

June 2002—NHGRI launches a redesigned Web site, www.genome.gov, which provides improved usability and easy access to new content for a wide range of users.

September 2002—NHGRI adds the cow, the dog and the ciliate *Oxytricha* to its list of prioritized model organisms to sequence as capacity becomes available.

September 2002—An international team of researchers led by NHGRI pinpoints the gene defect responsible for a form of the devastating brain disorder microcephaly, found for nine generations in infants among the Old Order Amish. *Nature Genetics* publishes the results, which may shed new light on normal brain development.

October 2002—NHGRI publishes "A User's Guide to the Human Genome" in *Nature Genetics*. The "how-to" manual is designedto encourage scientists to explore the human genome sequence available in public databases

October 2002—NHGRI, in cooperation with five other NIH institutes, awards a grant to combine three of the world's current protein databases into a single global resource called UniProt.

October 2002—NHGRI launches the International HapMap Project, a $100 million public-private effort to create a new type of genome map that will chart genetic variation among human populations. The HapMap will serve as a tool to speed the search for the genes involved in common disorders such as asthma, diabetes, heart disease and cancer.

November 2002—NHGRI selects Eric D. Green, M.D., Ph.D., as its new scientific director.

November 2002—NHGRI names William A Gahl, M.D., Ph.D., as its new intramural clinical director

December 2002—The Mouse Genome Sequencing Consortium announces the publication of a high-quality draft sequence of the mouse genome.

March 2003—NHGRI launches the ENCyclopedia Of DNA Elements (ENCODE) pilot project to identify all functional elements in human DNA.

April 2003—NHGRI celebrates the successful completion of the HGP two years ahead of schedule and under budget. The event coincides with, the 50th anniversary of the description of DNA's double helix and the 2003 publication of the vision document for the future of genomics research.

April 2003—NHGRI researchers identify the gene that causes the premature aging disorder progeria. The findings were released online in the journal *Nature*.

June 2003—NHGRI researchers make discoveries that may lead to safer methods of gene therapy.

June 2003—A detailed analysis of the sequence of the human Y chromosome is published in *Nature*.

July 2003—A detailed analysis of the sequence of chromosome 7, carried out by a multinational team of scientists led by the Washington University School of Medicine, uncovers structural features that appear to promote genetic changes that can cause disease. The findings were reported in the journal *Nature*.

August 2003—A team of researchers led by NHGRI compares the genomes of 13 vertebrate animals. The results, published in *Nature*, suggest that comparing a wide variety of species' genomes will illuminate genomic evolution and help to identify functional elements in the human genome.

October 2003—NHGRI announces the first grants in a three-year, $36 million scientific reconnaissance mission - called ENCODE - aimed at discovering all parts of the human genome that are crucial to biological function.

November 2003—NHGRI selects five centers to carry out a new generation of large-scale sequencing projects designed to maximize the promise of the HGP and dramatically expand understanding of human health and disease.

December 2003—NHGRI announces the formation of a new branch - the Social and Behavioral Research Branch - within its Division of Intramural Research.

December 2003—NHGRI announces the first draft version of the chimpanzee genome sequence and its alignment with the human genome.

December 2003—The International HapMap Consortium publishes a paper that sets forth the scientific rationale and strategy behind its effort to create a map of human genetic variation.

January 2004—NHGRI announces that the first draft version of the honey bee genome sequence has been deposited into free public databases.

January 2004—NHGRI and other scientists successfully create transgenic zebra fish using sperm genetically modified and grown in a laboratory dish, an achievement with implications for wide ranging research, from developmental biology to gene therapy. The study was published in the *Proceedings of the National Academy of Sciences*.

February 2004—The Genetic and Rare Disease Information Center established by NHGRI and the NIH Office of Rare Diseases, announces it has expanded its efforts to enable healthcare workers, patients and families who speak Spanish to take advantage of its free services.

February 2004—NHGRI's Large-Scale Sequencing Research Network announces it will begin sequencing the genome of the first marsupial, the gray short-tailed South American opossum, and more than a dozen other model organisms to further understanding of the human genome.

March 2004—NHGRI announces that the first draft version of the chicken genome sequence has been deposited into free public databases.

March 2004—NHGRI researchers and other scientists find variants in a gene that may predispose people to type 2 diabetes, the most common form of the disease.

March 2004—NHGRI announces that the International Sequencing Consortium has launched a free online resource, where scientists and the public can view the latest information on sequencing projects for animal, plant and eukaryotic genomes.

March 2004—The international Rat Genome Sequencing Project Consortium announces the publication of a high-quality draft sequence of the rat genome.

June 2004—NHGRI and the Melbourne-based Australian Genome Research Facility, Ltd. announce a partnership to sequence the genome of the tammar wallaby, a member of the kangaroo family.

June 2004—NHGRI announces it has established two new Centers of Excellence in Genomic Science at Harvard Medical School in Boston and the Johns Hopkins University School of Medicine in Baltimore.

July 2004—NHGRI announces that the first draft version of the dog genome sequence has been deposited into free public databases.

July 2004—NHGRI launches the NHGRI Policy and Legislative Database, an online resource that will enable researchers, health professionals and the general public to more easily locate information on laws and policies related to a wide array of genetic issues

July 2004—NHGRI scientists and an interdisciplinary consortium of researchers from 11 universities and institutions discover a possible inherited component for lung cancer, a disease normally associated with external causes, such as cigarette smoking.

August 2004—NHGRI's Large-Scale Sequencing Research Network announces a comprehensive strategic plan to sequence 18 additional organisms, including the African savannah elephant, domestic cat and orangutan, to help interpret the human genome.

August 2004—NHGRI launches four interdisciplinary Centers for Excellence in Ethical, Legal and Social Implications Research to address some of the most pressing questions raised by recent advances in genetic and genomic research.

October 2004—NHGRI announces that the first draft version of the bovine genome sequence has been deposited into free public databases.

October 2004—NHGRI awards more than $38 million in grants to develop new sequencing technologies to accomplish the near-term goal of sequencing a mammalian-sized genome for $100,000 and the longer-term challenge of sequencing an individual human genome for $1,000 or less.

October 2004—NHGRI announces the election of two of its medical geneticists, Alan Guttmacher and Robert Nussbaum, to the Institute of Medicine of the National Academies.

October 2004—The International Human Genome Sequencing Consortium, led in the United States by NHGRI and the Department of Energy (DOE), publishes its scientific description of the finished human genome sequence. The analysis, published in *Nature,* reduces the estimated number of human protein-coding genes from 35,000 to only 20,000-25,000, a surprisingly low number for our species.

October 2004—The ENCODE Consortium publishes a paper in *Science* that sets forth the scientific rationale and strategy behind its quest to produce a comprehensive catalog of all parts of the human genome crucial to biological function.

November 2004—NHGRI partners with the Office of the U.S. Surgeon General to launch a free computer program, My Family Health Portrait, which the public can use to record important information about their family health history.

December 2004—NHGRI and the international Chicken Genome Sequencing Consortium publish in *Nature* an analysis comparing the chicken and human genomes. It is the first bird to have its genome sequenced and analyzed.

February 2005—NHGRI establishes an Office of Ethics, appointing Barbara Fuller as Deputy Ethics Counselor.

March 2005—NIH hails the first comprehensive analysis of the sequence of the human X chromosome. The analysis, published in *Nature,* provides sweeping new insights into the evolution of sex chromosomes and the biological differences between males and females.

August 2005—NHGRI awards grants totaling more than $32 million to advance the development of innovative sequencing technologies intended to reduce the cost of DNA sequencing and expand the use of genomics in biomedical research and health care.

August 2005—In a surprising development, a research team led by NHGRI finds that a class of experimental anti-cancer drugs shows promise in laboratory studies for treating the fatal genetic disorder that causes premature aging. The results are published in the *Proceedings of the National Academy of Sciences*.

August 2005—The first comprehensive comparison of the genetic blueprints of humans and chimpanzees is published in the journal *Nature*, showing our closest living relatives share perfect identity with 96 percent of our DNA sequence.

October 2005—The NIH awards contracts that will give researchers unprecedented access to two private collections of knockout mice, providing valuable models for the study of human disease and laying the groundwork for a public, genome-wide library of knockout mice.

October 2005—The International HapMap Consortium publishes a comprehensive catalog of human genetic variation. This landmark achievement, published in *Nature*, serves to accelerate the search for genes involved in common diseases, such as asthma, diabetes, cancer and heart disease.

November 2005—As part of the U.S. Surgeon General's Family Health Initiative, an updated version of the computerized tool designed to help families gather their

health history information is unveiled.

December 2005—NHGRI and the National Cancer Institute (NCI) launch The Cancer Genome Atlas (TCGA), a comprehensive effort to accelerate understanding of the molecular basis of cancer through the application of genome analysis technologies.

March 2006—A multi-institution team of experts, coordinated by geneticists from NHGRI, supports efforts to identify more than 70 bodies still unidentified in the aftermath of Hurricane Katrina.

July 2006—Researchers at the NIH Chemical Genomics Center (NCGC) -- a trans-NIH center administered by NHGRI --develop a new screening approach that can profile compounds in large chemical libraries more accurately and precisely than standard methods. This advance speeds the production of data that can be used to probe biological activities and identify leads for drug discovery.

August 2006—NHGRI awards grants totaling $54 million over five years to establish one new Center of Excellence in Genomic Science at the California Institute of Technology in Pasadena, Calif. and continue support for two existing centers.

September 2006—NHGRI and NCI choose the first three cancers to be studied in the pilot phase of The Cancer Genome Atlas. The cancers to be studied in the TCGA Pilot Project are lung, brain (glioblastoma) and ovarian.

October 2006—NHGRI awards grants totaling more than $13 million to further speed the development of innovative sequencing technologies that reduce the cost of DNA sequencing and expand the use of genomics in medical research and health care.

April 2007—In the most comprehensive look at genetic risk factors for type 2 diabetes to date, NHGRI researchers, working in close collaboration with two other scientists, identify at least four new genetic variants associated with increased risk of diabetes and confirm existence of another six. All three reports are published in *Science*.

May 2007—NHGRI and NCI team with Group Health Cooperative in Seattle and Henry Ford Health System in Detroit to launch the Multiplex Initiative. The effort will explore the interest level of healthy, young adults in receiving genetic testing for eight common conditions.

July 2007—As part of the TCGA pilot, NCI and NHGRI award eight two-year grants totaling $3.4 million to support the development of innovative technologies for exploring the genomic underpinnings of cancer.

August 2007—Looking ahead to a future in which each person's genome can be sequenced as a routine part of medical research and health care, NHGRI awards more than $15 million in grants to support development of innovative technologies with the potential to dramatically reduce the cost of DNA sequencing.

August 2007—NHGRI establishes Genomic Healthcare Branch, headed by William Gregory Feero to promote the effective integration of genomic discoveries into healthcare.

August 2007—NHGRI awards grants of $30 million to establish a new Center of Excellence in Genomic Science at the Dana Farber-Cancer Institute and to continue support of the center at Stanford University.

August 2007—NHGRI establishes the Office of Population Genomics, headed by Teri Manolio.

October 2007—NHGRI awards grants totaling more than $80 million over the next four years to expand the ENCODE project, which in its pilot phase yielded provocative new insights into the organization and function of the human genome.

October 2007—NHGRI establishes two new centers at the University of North Carolina, Chapel Hill and University of Pennsylvania, Philadelphia, to address the most critical ethical, legal and social questions faced by researchers and patients involved in genetic and genomic research.

October 2007—The NIH Intramural Sequencing Center (NISC), a trans-NIH center administered by NHGRI, celebrates its 10th anniversary with a day-long symposium.

November 2007—An international team of scientists, supported in part by NHGRI, announces that its systematic effort to map the genomic changes underlying lung cancer has uncovered a critical gene alteration not previously linked to any form of cancer. The results are published in Nature.

November 2007—In a White House Ceremony, NHGRI Director Francis S. Collins is awarded the Presidential Medal of Freedom by President George W. Bush.

December 2007—To better understand the role that bacteria, fungi and other microbes play in human health, the NIH launches of the Human Microbiome Project. The human microbiome is the collective genomes of all microorganisms present in or on the human body. NHGRI, the National Institute of Allergy and Infectious Diseases, and the National Institute of Dental and Craniofacial Research lead the project on behalf of NIH.

January 2008—An international research consortium announces the 1000 Genomes Project. This ambitious effort will involve sequencing the genomes of at least a thousand people from around the world to create the most detailed and medically useful picture to date of human genetic variation. NHGRI is a major funder of the 1000 Genomes Project.

February 2008—NHGRI and the National Institute of Environmental Health Sciences (NIEHS) collaborate with the U.S. Environmental Protection Agency to begin testing the safety of chemicals, ranging from pesticides to household cleaners. The initiative uses the NIH Chemical Genomics Center's (NCGC) high-speed, automated screening robots to test suspected toxic compounds using cells and isolated molecular targets instead of laboratory animals.

March 2008—NIH announces the establishment of the NIH Intramural Center for Research on Genomics and Global Health (CRGGH), a new venue for research about

the way populations are impacted by diseases, including obesity, diabetes and hypertension. CRGGH will employ a genomics approach, collecting and analyzing genetic, clinical, lifestyle and socio-economic data to study a range of clinical conditions that have puzzled and troubled public health experts for decades. CRGGH is part of the NIH Office of Intramural Research and administered by NHGRI.

May 2008—The first analysis of the genome sequence of the duck-billed platypus, reveals clues about how genomes were organized during the early evolution of mammals. The research, published in *Nature,* was supported in part by NHGRI.

May 2008—President Bush signs into law the Genetic Information Nondiscrimination Act (GINA) that will protect Americans against discrimination based on their genetic information when it comes to health insurance and employment. The bill had passed the Senate unanimously and the House by a vote of 414 to 1.

May 2008—Francis S. Collins announces his intention to step down as NHGRI director on August 1 to explore writing projects and other professional opportunities.

August 2008—Alan E. Guttmacher is named Acting Director of NHGRI.

September 2008—NIH funds a network of nine centers across the country that will use high tech screening methods to identify small molecules for use as biological probes and targets for drug development.. The NIH Chemical Genomics Center, administered by NHGRI, is funded as part of the network.

September 2008—The TCGA Research Network reports the first results of its large-scale, comprehensive study of the most common form of brain cancer, glioblastoma. In a paper published in *Nature*, the TCGA team describes the discovery of new genetic mutations and other types of DNA alterations with potential implications for the diagnosis and treatment of glioblastoma.

September 2008—The NIH Genes, Environment and Health Initiative, managed by NHGRI and NIEHS, awards grants, estimated to be up to $5.5 million over two years, for six studies aimed at finding genetic factors that influence the risks for stroke, glaucoma, high blood pressure, prostate cancer and other common disorders.

October 2008—A team of researchers from NHGRI and the National Heart, Lung, and Blood Institute (NHLBI) reports in the *Proceedings of the National Academy of Sciences* that they have discovered an experimental anti-cancer drug can prevent—and even reverse—potentially fatal cardiovascular damage in a mouse model of progeria, a rare genetic disorder that causes the most dramatic form of human premature aging.

October 2008—NIH announces the first awards for its Human Microbiome Project, which will lay a foundation for efforts to explore how complex communities of microbes interact with the human body to influence health and disease.

October 2008—NHGRI researchers help to identify a protein that plays matchmaker between two key types of white blood cells, T and B cells, enabling them to interact in a way that is crucial to establishing long-lasting immunity after an infection. The results are published in *Nature*.

October 2008—The NIH Human Microbiome Project collaborates with scientists around the globe announce to form the International Human Microbiome Consortium (IHMC), an effort that will enable researchers to characterize the relationship of the human microbiome in the maintenance of health and in disease.

October 2008—A multi-institution team, funded by NHGRI, reports results in Nature of the largest effort to date to chart the genetic changes involved in the most common form of lung cancer, lung adenocarcinoma.

December 2008—An international consortium including NHGRI researchers, in search of the genetic risk factors for obesity, identifies six new genetic variants associated with BMI, or body mass index, a measurement that compares height to weight. The results, funded in part by NIH, are published online in the journal *Nature Genetics*.

February 2009—An NIH study that includes NHGRI researchers reveals surprising new insights into the process used to initially identify an experimental drug now being tested in people with cystic fibrosis and muscular dystrophy. In a paper published in *Proceedings of the National Academies of Sciences*, researchers from the NIH Chemical Genomics Center, suggest more work may be needed to make sure the screening process to select promising agents was not flawed by its effects on a firefly enzyme used as a marker.

February 2009—In a large-scale study and an upcoming clinical trial, scientists supported in part by NHGRI, use information from thousands of genetically and geographically diverse patients to develop a way to use genetic information from patients that could help doctors better determine optimal warfarin doses. The analysis is reported in *The New England Journal of Medicine*.

March 2009—An international team that includes NHGRI investigators reports in the journal *Pediatrics* that children born to women who have low blood levels of vitamin B12 shortly before and after conception may have an increased risk of a neural tube defect.

March 2009—Researchers from the NIH and NHGRI find a new way of detecting functional regions in the human genome. The novel approach involves looking at the three-dimensional shape of the genome's DNA and not just reading the sequence of the four-letter alphabet of its DNA bases. The results are published online in Science.

March 2009—A team led by NHGRI scientists identifies a gene that suppresses tumor growth in melanoma, the deadliest form of skin cancer. The finding is reported in the journal *Nature Genetics* as part of a systematic genetic analysis of a group of enzymes implicated in skin cancer and many other types of cancer.

April 2009—Scientists identify a previously unknown connection between two genetic variants and an increased risk of stroke, providing strong evidence for the existence of specific genes that help explain the genetic component of stroke. The research is funded by NHLBI and several other NIH institutes and centers including NHGRI.

April 2009—NHGRI announces the release of the first version of PhenX, a free online toolkit aimed at standardizing measurements of research subjects' physical characteristics and environmental exposures. The tools give researchers more power to compare data from multiple studies, accelerating efforts to understand the complex genetic and environmental factors that cause cancer, heart disease, depression and other common diseases.

April 2009—The U.S. Department of Agriculture and the NIH announce that an international consortium of researchers has completed an analysis of the genome of domestic cattle, the first livestock mammal to have its genetic blueprint sequenced and analyzed. The landmark research, which received major support from NHGRI, bolsters efforts to produce better beef and dairy products and lead to a better understanding of the human genome.

May 2009—An international research team identifies a number of unsuspected genetic variants associated with systolic blood pressure (SBP), diastolic blood pressure (DBP), and hypertension (high blood pressure), suggesting potential avenues of investigation for the prevention or treatment of hypertension. The work is supported in part by NHGRI.

May 2009—The NIH launches the first integrated drug development pipeline to produce new treatments for rare and neglected diseases. The $24 million program, whose laboratory operations are managed by NHGRI at the NIH Chemical Genomics, jumpstarts a trans-NIH initiative called the Therapeutics for Rare and Neglected Diseases program, or TRND.

May 2009—NHGRI researchers studying the skin's microbiome publish an analysis in the journal *Science* revealing that our skin is home to a much wider array of bacteria than previously thought. The study, done in collaboration with other NIH researchers, also shows the bacteria that live under your arms likely are more similar to those under another person's arm than they are to the bacteria that live on your forearm.

June 2009—The NIH's Human Microbiome Project awards more than $42 million to expand its exploration of how the trillions of microscopic organisms that live in or on our bodies affect our health.

July 2009—An NIH research team led by NHGRI researchers finds that a single evolutionary event appears to explain the short, curved legs that characterize all of today's dachshunds, corgis, basset hounds and at least 16 other breeds of dogs. In addition to what it reveals about short-legged dogs, the unexpected discovery provides new clues about how physical differences may arise within species and suggests new approaches to understanding a form of human dwarfism. The results are reported in the journal *Science*.

July 2009—NIH researchers report in the online issue of *PLoS Genetics* the discovery of five genetic variants related to blood pressure in African-Americans, findings that may provide new clues to treating and preventing hypertension. This effort, which includes NHGRI researchers, marks the first time that a relatively new research approach, called a genome-wide association study, has focused on blood pressure and hypertension in an African-American population.

August 2009—Researchers, supported in part by NHGRI, generate massive amounts of DNA sequencing data of the complete set of exons, or “exomes”, from the genomes of 12 people. The findings, which demonstrate the feasibility of this strategy to find rare genetic variants that may cause or contribute to disease, are published online in the journal *Nature*.

August 2009—A team of NIH researchers, led by NHGRI, discover variants in just three genes acting in different combinations that account for the wide range of coat textures seen in dogs from the poodle's tight curls to the beagle's stick-straight fur. These findings can be found in the advance online issue of the journal *Science*.

August 2009—NHGRI researchers lead a study that identifies a new group of genetic mutations involved in the deadliest form of skin cancer, melanoma. This discovery, published in *Nature Genetics*, is particularly encouraging because some of the mutations, which were found in nearly one-fifth of melanoma cases, reside in a gene already targeted by a drug approved for certain types of breast cancer.

September 2009—NHGRI announces grants expected to total approximately $45 million to establish new Centers of Excellence in Genomic Science at the Medical College of Wisconsin and University of North Carolina, Chapel Hill as well as to continue support of existing centers at Johns Hopkins University and the University of Southern California.

October 2009—NHGRI launches the next generation of its online Talking Glossary of Genetic Terms. The glossary contains several new features, including more than 100 colorful illustrations and more than two dozen 3-D animations that allow the user to dive in and see genetic concepts in action at the cellular level.

October 2009—An NHGRI-led research team finds that carriers of a rare, genetic condition called Gaucher disease face a risk of developing Parkinson's disease more than five times greater than the general public. The findings are published in the *New England Journal of Medicine*.

November 2009—After an extensive national search, NIH Director Francis S. Collins, M.D., Ph.D., announces the appointment of Eric D. Green, M.D., Ph.D., to be director of the NHGRI. It is the first time an institute director has risen to lead the entire NIH and subsequently picked his own successor.

BIOGRAPHICAL SKETCH OF NHGRI DIRECTOR, ERIC D. GREEN, M.D., PH.D.

Eric D. Green, M.D., Ph.D., was named to be the third director of the National Human Genome Research Institute (NHGRI), effective at the end of November 2009. Prior to this appointment, he was the Scientific Director of NHGRI, a position he has held since 2002. In addition, he served as chief of the NHGRI Genome Technology Branch (since 1996) and director of the NIH Intramural Sequencing Center (NISC) (since 1997). Born and raised in Saint Louis in December 1959, Dr. Green comes from a scientific family. His father, Maurice Green, Ph.D., is chairman of the Institute for Molecular Virology at Saint Louis University School of Medicine, and his brother Michael Green, M.D., Ph.D., is a molecular biologist at the University of Massachusetts at Worcester, where he directs the Program in Gene Function and Expression and is an investigator of the Howard Hughes Medical Institute.

Dr. Green received a Bachelor of Science in bacteriology from the University of Wisconsin at Madison in 1981 and both a Ph.D. in cell biology and an M.D. in 1987 from Washington University in Saint Louis. From 1987 to 1992, he was a resident in laboratory medicine in the departments of pathology and internal medicine at the

Washington University School of Medicine, serving as chief resident in laboratory medicine from 1990 to 1992.

For his Ph.D., Dr. Green studied sugar molecules that are attached to proteins. But the scientific debate about the possibility of a Human Genome Project raging in the late 1980s coupled with his clinical interests in laboratory-based diagnostics prompted him to switch scientific fields. Dr. Green became a postdoctoral research fellow in the laboratory of Maynard V. Olson, Ph.D., then at the Washington University School of Medicine genetics department and a pioneer in developing approaches for studying whole genomes.

In 1992, Dr. Green was appointed assistant professor of pathology, genetics, and internal medicine at the Washington University School of Medicine, as well as a co-investigator in the Human Genome Center at Washington University, which made substantial contributions to the early successes of the Human Genome Project.

Dr. Green was recruited to join the newly formed NHGRI Division of Intramural Research in 1994. Two years later, he earned tenure at the National Institutes of Health (NIH), rising to the rank of a senior investigator; that same year, he was also appointed chief of the Genome Technology Branch. The next year, he became the founding director of NISC.

In 2002, Dr. Green was named NHGRI scientific director and director of the NHGRI Division of Intramural Research.

Honors given to Dr. Green include a Helen Hay Whitney Postdoctoral Research Fellowship (1989-1990), a Lucille P. Markey Scholar Award in Biomedical Science (1990-1994), induction into the American Society for Clinical Investigation (2002), the Lillian M. Gilbreth Lectureship for Young Engineers at the National Academy of Engineering (2001), an Alumni Achievement Award from Washington University School of Medicine (2005), and induction into the American Association of Physicians (in 2007). He is a Founding Editor of the journal Genome Research (1995-present) and a Series Editor of *Genome Analysis: A Laboratory Manual* (1994-1998), both published by Cold Spring Harbor Laboratory Press. He is also Co-Editor of *Annual Review of Genomics and Human Genetics* (since 2005). Dr. Green has authored and co-authored over 240 scientific publications.

NHGRI DIRECTORS

Name	In Office from	To
James D. Watson	1989	April 10, 1992
Michael Gottesman (Acting)	April 10, 1992	April 1993
Francis S. Collins	April 1993	August 2008
Alan E. Guttmacher (Acting)	August 2008	December 2009
Eric D. Green	December 2009	Present

MAJOR PROGRAMS

Office of the Director

The Office of the Director oversees general operations, administration and communications for the National Human Genome Research Institute (NHGRI). The director's office provides overall leadership; sets policies; develops scientific, fiscal and management strategies; assists in governing the ethical behavior of its employees; and coordinates genomic research for the NIH with other federal, private and international programs.

The office also supports international meetings, workshops and other activities essential to the efficient international coordination and exchange of data.

Division of Extramural Research

The Division of Extramural Research (DER) supports and administers the role of the NIH in genomic research. In consultation with the broader genomic community, the DER supports grants for research and for training and career development at sites nationwide.

Three branches perform the work of this division. The Extramural Programs Branch administers and supports grants for extramural research, institutional training, fellowships, career awards and minority awards in support of genomic research; plans and supports activities that advance genomics; and directs the Ethical, Legal and Social Implications (ELSI) Research Program, which explores the ethical and policy issues raised by genetic research. The Scientific Review Branch plans and conducts the initial peer review of most of the research applications to NHGRI. The Grants Administration Branch oversees the fiscal aspects of NHGRI grant programs.

The DER also provides administrative management for three chartered advisory committees whose members review NHGRI's intramural and sponsored research.

Division of Intramural Research

The Division of Intramural Research (DIR) at the NHGRI plans and conducts a broad program of laboratory and clinical research to translate genome research into a greater understanding of human genetic disease. The DIR acts as a focal point at the NIH for genome research and maintains core facilities that serve as a resource for the entire NIH intramural research community. It evaluates research efforts and establishes intramural program priorities; allocates funds, space and personnel ceilings to ensure maximum utilization of available resources in the attainment of NHGRI objectives; and integrates new research activities into the program structure.

The DIR also collaborates with other NIH institutes, centers and external research institutions; maintains an awareness of national and international research efforts

in relevant program areas; and advises the director and staff on areas of science and intramural research programs of interest to NHGRI.

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National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

National Institute on Aging

Mission | Important Events | Director | Programs

MISSION

Since 1974, the mission of the National Institute on Aging (NIA) has been to improve the health and well-being of older Americans through biomedical, social, and behavioral research.

The Institute conducts and supports research on aging through extramural and intramural programs, focusing on aging processes, age-related diseases, and special problems and needs of the aged. The extramural program funds research and training at universities, hospitals, medical centers, and other public and private organizations nationwide. The intramural program conducts basic and clinical research in Baltimore and on the NIH campus in Bethesda, Maryland. NIA also has a broad information program to communicate about research and health with older people, their families, health professionals, researchers, policymakers, and others.

IMPORTANT EVENTS IN NIA HISTORY

December 2, 1971—The White House Conference on Aging recommends the creation of a separate National Institute on Aging at the National institutes of Health.

May 31, 1974—Public Law 93-296 authorizes the establishment of a National Institute on Aging and mandates the Institute develop a national comprehensive plan to coordinate the U.S. Department of Health, Education, and Welfare (succeeded by the Department of Health and Human Services) involvement in aging research.

October 7, 1974—The National Institute on Aging is established.

April 23, 1975—First meeting of the National Advisory Council on Aging is held.

1984—NIA funds Alzheimer's Disease Centers, where researchers at medical institutions nationwide focus on prevention and treatment while improving care and diagnosis.

1986—Per congressional direction, NIA funds the Federal Forum on Aging-Related Statistics, a coordinating organization made up of more than 35 Federal agencies.

November 14, 1986—P.L. 99-660, section 501-503, authorizes NIA's Alzheimer's Disease Education and Referral (ADEAR) Center as part of a broad program to conduct research and distribute information about Alzheimer's disease to health professionals, patients and their families, and the general public.

November 4, 1988—P.L. 100-607 establishes the Geriatric Research and Training Centers, renamed the Claude D. Pepper Older American Independence Centers in 1990 and charged with conducting research on diseases that threaten independent living.

1991—NIA sets up the Alzheimer's Disease Cooperative Study, an ongoing consortium of academic medical centers and others to facilitate clinical trials research.

1992—NIA and the University of Michigan begin the Health and Retirement Study, which follows more than 20,000 people at 2-year intervals, providing data from pre-retirement to advanced age to allow multidisciplinary study of the causes and course of retirement.

1993—The first Edward Roybal Centers for Research on Applied Gerontology are authorized, focusing on translational research to convert basic and clinical findings into programs that improve the lives of older people and their families.

NIA launches the Longevity Assurance Genes initiative, an interactive network of funded researchers looking for genetic clues to longevity, using a variety of organisms such *as C. elegans, Drosophila,* and yeast.

1994—The first Demography of Aging Centers are funded to provide research on health, economics, and aging and to make more effective use of data from several national surveys of health, retirement, and long-term care.

The Study of Women's Health Across the Nation (SWAN) is launched to characterize in diverse populations the biological and psychosocial influences related to the transition to menopause.

1995—Nathan Shock Centers of Excellence in Basic Biology of Aging are established to further the study of the basic processes of aging.

1996—NIA introduces *Exercise: A Guide from the National Institute on Aging,* providing encouragement and evidence-based guidance specifically for older adults to engage in exercise.

1997—The Resource Centers for Minority Aging Research (RCMARs) are funded to investigate the variability of health differences experienced across racial and ethnic groups, as well as the mentoring of new scholars in health disparities research.

2000—The Institute distributes established mouse cDNA microarray/clone set containing more than 15,000 unique genes to 10 designated academic centers worldwide.

2001—In a unique private-public partnership, NIA joins the Osteoarthritis Initiative to bring together resources and commitment to the search for biological markers of osteoarthritis.

NIA and the Icelandic Heart Association announce collaboration on a vast study on the interactions of age, genes, and the environment. The collaboration extends 34 years of data on the health of 23,000 Icelandic residents into the new millennium.

2003—NIA and the National Library of Medicine (NLM) launch NIHSeniorhealth.gov, a website designed to encourage older people to use the internet.

NIA, joined by the Alzheimer's Association, expands the Alzheimer's Disease Genetics Initiative to create a large bank of genetic materials and cell lines for study to speed up the discovery of risk-factor genes for late-onset Alzheimer's disease.

NIA and the American Federation for Aging Research—in collaboration with the John A. Hartford Foundation, the Atlantic Philanthropies, and the Staff Foundation—establish a public-private partnership to support clinically trained junior faculty to pursue careers in aging research.

2004—NIA launches the Longevity Consortium, a network of investigators from several large-scale human cohort studies working in collaboration with individual basic biological aging researchers to facilitate the discovery, confirmation, and understanding of genetic determinants of healthy human longevity.

NIA, in conjunction with other Federal agencies and private companies and organizations through the Foundation for the National Institutes of Health, leads the Alzheimer's Disease Neuroimaging Initiative.

NIA launches Healthy Aging in Neighborhoods of Diversity across the Life Span (HANDLS), a multidisciplinary community-based, longitudinal, epidemiologic study examining the influences and interaction of race and socioeconomic status on the development of age-associated health disparities among socioeconomically diverse African Americans and whites in Baltimore.

2006—NIA leads the NIH conference "AD: Setting the Research Agenda a Century after Auguste D," a conclave assessing the state of current Alzheimer's disease research and the most promising routes to progress.

2007—U.S. Secretary of State Condoleezza Rice sponsors the Summit on Global Aging in collaboration with NIA to call attention to challenges and opportunities worldwide from population aging.

2008—A Biology of Aging Summit convenes to review NIA's research portfolio, identify areas of opportunity, and facilitate formulation of comprehensive research plans for the future.

Longitudinal Study of Aging is developed to examine what factors preserve physical and cognitive Insights into the Determinants of Exceptional Aging and Longevity (IDEAL), a sub-study of the Baltimore function in late life and prevent disease and disability, in a small but growing segment of the aging population.

NIA celebrates the 50th anniversary of the Baltimore Longitudinal Study of Aging.

2009—NIA collaborates with HBO Documentary Films on THE ALZHEIMER'S PROJECT, an Emmy Award winning, multi-platform (television, web, DVD, and print) public health series.

2011—NIA launches the Go4Life campaign to promote exercise and physical activity nationwide for people 50 and older, with public and private partners from a variety of aging, fitness, and provider organizations.

NIA and the Alzheimer's Association lead an effort to update diagnostic guidelines for Alzheimer's disease to reflect the full spectrum of the disease, marking the first time in 27 years clinical and research criteria are changed.

The National Alzheimer's Project Act is signed into law. Dubbed NAPA, it requires a coordinated national effort to find ways to treat or prevent Alzheimer's disease and related dementias and to improve care and services. NIH, represented by NIA, participates in the federal Advisory Council on Alzheimer's Research, Care, and Services.

The Trans-NIH GeroScience Interest Group is formed, with leadership from the NIA. The group promotes discussion, sharing of ideas, and coordination of activities within the NIH research community, working on mechanisms underlying age-related changes, including those which could lead to increased disease susceptibility.

2012—HHS Secretary Kathleen Sebelius announces the NAPA-required National Plan to Address Alzheimer's Disease. NIA plays a critical role in developing the first goal of the plan — to Effectively Treat or Prevent Alzheimer's by 2025.

The NIA Intramural Research Program (IRP) was reorganized to recognize new paradigms in the field of aging research. The program now integrates labs and

resources bringing together people who share a similar research interest but are coming at it from different vantage points.

NIA organizes the Alzheimer's Disease Research Summit 2012: Path to Treatment and Prevention. Some 500 researchers and advocates attend the meeting, which results in recommendations aimed at advancing Alzheimer's disease research.

The International Alzheimer's Disease Research Portfolio is launched. Built in collaboration with the Alzheimer's Association, the database captures the full spectrum of research investment and resources and enables public and private funders of Alzheimer's research to share and review funding data.

NIA leads development of the NIH Toolbox for Neurological and Behavioral Function. Unveiled in 2012, the Toolbox offers researchers a free set of brief tests to assess cognitive, sensory, motor and emotional function in people from toddlers to older adults.

BIOGRAPHICAL SKETCH OF NIA DIRECTOR RICHARD J. HODES, M.D.

Richard J. Hodes, M.D., directs the research program of the National Institute on Aging (NIA) at the National Institutes of Health. A leading immunologist, Dr. Hodes was named Director of the NIA in 1993, to oversee studies of the basic, clinical, epidemiological, and social aspects of aging.

Under Dr. Hodes' stewardship, the NIA budget has surpassed $1 billion, reflecting increased public interest in aging as America and the world grow older. Dr. Hodes has devoted his tenure to the development of a strong, diverse, and balanced research program, focusing on the genetics and biology of aging; basic and clinical studies aimed at reducing disease and disability, including Alzheimer's disease and age-related cognitive change; and investigation of the behavioral and social aspects of aging. Ultimately, these efforts have one goal—improving the health and quality of life for older people and their families.

Dr. Hodes is a Diplomate of the American Board of Internal Medicine. In 1995, he was elected as a member of The Dana Alliance for Brain Initiatives; in 1997, he was elected a Fellow of the American Association for the Advancement of Science; and in 1999, he was elected to membership in the Institute of Medicine of the National Academy of Sciences.

Dr. Hodes is a graduate of Yale University and received his M.D. from Harvard Medical School. He completed training in Internal Medicine at Massachusetts General Hospital and in Oncology at the National Cancer Institute. As an author of more than 250 research papers, he is an influential scientist in and contributor to the field of immunology.

NIA DIRECTORS

Name	In Office From	To
Norman Kretchmer (Acting)	October 1974	July 1975
Richard C. Greulich (Acting)	July 1975	April 1976
Robert N. Butler	May 1, 1976	July 1982
Robert L. Ringler (Acting)	July 16, 1982	June 30, 1983
T. Franklin Williams	July 1, 1983	July 31, 1991
Gene D. Cohen (Acting)	July 1, 1991	May 31, 1993
Richard J. Hodes	June 1, 1993	Present

RESEARCH PROGRAMS

Intramural Research

The goal of NIA's Intramural Research Program (IRP) is to support broad-based research centered on critical issues regarding the general biology of aging, age-associated diseases and disabilities. In 2012, the NIA IRP was reorganized to recognize new paradigms in the field of aging research. The program now integrates labs and resources, bring together people who share a similar research interest, but are coming at it from different vantage points.

Specific areas of study on the biology of aging focus on 1) characterization of normal aging, 2) cell cycle regulation and programmed cell death, 3) stress response, 4) DNA damage and repair, 5) genetics, and 6) immunology. Age-associated disease and disabilities research includes the study of 1) factors influencing the onset of progression of disability and frailty; 2) Alzheimer's disease and cognitive decline; 3) cancer; 4) osteoporosis and osteoarthritis; 5) cardiovascular disease and hypertension; and 6) diabetes. In addition, researchers at NIA's IRP develop and/or test different intervention strategies—e.g., pharmacotherapy, gene therapy, and behavioral or lifestyle changes—to treat many age-associated diseases.

The NIA's IRP comprises 9 scientific laboratories and 1 clinical branch. Most of NIA's intramural research is conducted in Baltimore at the NIH Biomedical Research Center. Clinical research resources are located at Harbor Hospital in Southeast Baltimore. Two laboratories are located in Bethesda. IRP laboratories provide a stimulating environment for age-related research. The IRP also offers many excellent training opportunities in both laboratory research and clinical medicine for investigators at all stages of their careers. To read more about the NIA's Intramural Program, go to www.grc.nia.nih.gov.

IRP Laboratories

Laboratory of Cardiovascular Science (LCS)

The overall goals of LCS are: 1) to identify age associated changes that occur within the cardiovascular system and to determine the mechanisms for these changes; 2) to determine how aging of the heart and vasculature interacts with chronic disease states to enhance the risk for CV diseases in older persons; 3) to study basic mechanisms in excitation-contraction coupling and how these are modulated by surface receptor signaling pathways in cardiac cells; 4) to elucidate mechanisms of pacemaker activity in sinoatrial nodal cells; 5) to elucidate mechanisms that govern cardiac and vascular cell survival; and 6) to establish the potentials and limitations of new therapeutic approaches such as changes in lifestyle, novel pharmacologic agents or gene or stem cell transfer techniques in aging or disease states.

Laboratory of Molecular Biology and Immunology (LMBI)
The unifying theme of LMBI's research program is to uncover molecular mechanisms that are pertinent to understanding and ameliorating age-associated disabilities and diseases, with particular emphasis on changes in the immune system. Programs cover fundamental biological questions such as: 1) the study of gene, regulatory mechanism that mediate cellular responses to developmental signals, immune activation and stress stimuli, 2) induction of effective immune responses, including the mechanisms of class switch recombination and somatic hypermutation, and generation and maintenance of memory, 3) the role of telomere length and telomerase activity in lymphocyte function and aging. LMBI programs contain a strong translational component with studies aimed at improving vaccine efficacy in the elderly and examining the molecular and cellular basis of tumor metastasis. A wide variety of in vitro and in vivo models are employed to approach these issues. LMBI also share a close working relationship with the Baltimore Longitudinal Study of Aging that enables direct application of molecular parameters to the human condition.

Laboratory of Clinical Investigation (LCI)
LCI seeks to understand fundamental metabolic processes that change with aging, to elucidate which alterations are pathological and which are homeostatic as humans age. Investigators in the LCI hope to uncover ways to manage and/or circumvent the pathological alterations so that the health of the elderly stays stable. Studies are performed at molecular, cellular, animal model and human levels. Further, LCI takes a multisystem approach to age related changes because changes in one system lead to adaptive changes in another. Understanding which are adaptive and which are primary is an intense area of investigation using newly developed multidimensional algorithms and computer programs. The areas of most intense investigation within LCI are: pancreatic islet morphology and changes therein with obesity and aging; molecular and cellular changes with osteoarthritis; metabolic causes of neurodegeneration; alterations in drug metabolism with age, and connective tissue diseases. In each of these cases, translational research is far advanced on target compounds that are hypothesized to alter natural history of age-related diseases or are already shown to be beneficial in humans. LCI also carries out proof-of-principle Phase 1 research with index compounds that have been developed in the basic science laboratories.

Laboratory of Epidemiology and Population Sciences (LEPS)
Research in LEPS investigates the causes and consequences of disease and function-specific outcomes that are highly prevalent in the population, including health disparities. The laboratory takes a multi-modality and multi-disciplinary approach that is applied in population-based cohorts developed by LEPS scientists in collaboration with other intra-mural and with extra-mural investigators. Studies are designed to integrate knowledge and identify common pathways of disease and function related to the cardiovascular, neuro-cognitive, musculoskeletal, body composition and metabolic systems as these are affected by age, health disparities, socioeconomic status, genetic difference, or other risks. Common mechanisms of interest include inflammation, glycemic control, increase in visceral fat and decrease in muscle mass, elevated blood pressure and atherosclerosis. Genetic contributions and their interactions with behavioral and physiologic factors are studied in the context of genome wide association study consortia. Efforts also focus on translation to clinical trials of our findings based on observational studies. In addition, we actively investigate state-of-the-art objective measures that can be applied to population-based samples.

Laboratory of Genetics (LG)
The LG views aging as an integrated extension of human development, with important genes influencing the course of aging even through action in embryonic and fetal life. The long-term goal is to prevent or ameliorate problems of aging tissues by understanding the normal pathways and genetic disorders that affect development, and in using stem cells to help regenerate tissues. Approaches 1) looking for biomarkers of aging and disease progression with novel pattern recognition algorithms and image informatics systems; 2) investigation of mechanisms of DNA damage response, chromatin remodeling, and RNA-level regulation, their connections with cancer; and analyses of genetic factors affecting age-related diseases and conditions, including immunosenescence, in a Sardinian founder population.

Laboratory of Molecular Gerontology (LMG)
The LMG investigates processes and mechanisms such as genomic instability, DNA repair, DNA replication, and transcription with special attention to examining the role of DNA damage accumulation in senescence as a major molecular change with aging. The Oxidative DNA Damage Processing and Mitochondrial Functions Unit investigates the basis for the mitochondrial hypothesis of aging which states that accumulation of DNA damage with aging leads to the phenotypical changes that are observed in senescence and age-associated disease. The Repair of Endogenous DNA Damage Section investigates the mechanism involved in base excision repair and the function of individual DNA repair proteins and their interaction. The Telomere Maintenance and DNA Repair Unit studies proteins and functions involved in the maintenance of the chromosome ends, the telomeres. The Gene Targeting Unit is exploring how DNA interstrand crosslinks, very detrimental to cells, are removed from DNA and how this relates to age-associated disease. The Section on DNA Helicases focuses on the roles of DNA helicases in genomic stability.

Laboratory of Neurogenetics (LNG)
The LNG studies neurodegenerative diseases based on a resolution of their genetic etiology. The Molecular Genetics Section is focused on finding genes for neurodegenerative disease; the Cell Biology & Gene Expression Section seeks to develop an understanding of the effects of mutant genes on cell physiology; the Transgenic Unit examines the pathogenesis of neurodegenerative disorders in whole animals and to test potential treatments for the diseases; and the Neuromuscular Disease Research Unit works toward an understanding of the genetic basis of neuromuscular disorders. Underpinning this structure are 3 groups: a Clinical Core whose role is to identify patients with neurological disorders and facilitate collaborations with clinical investigators from around the world, a Computational Biology Core whose role is to facilitate the analysis of laboratory data in the broad context of the wealth of information available through the Human Genome Project and related endeavors, and a Genomic Technologies Group whose role is to leverage and support the most recent genomic approaches.

Laboratory of Neurosciences (LNS)
The LNS seeks to understand the cellular and molecular mechanisms of neural plasticity during aging and to develop novel interventions for the prevention and

treatment of neurodegenerative conditions such as Alzheimer's, Parkinson's, and Huntington's diseases, as well as stroke. The LNS has a particular focus on signal transduction pathways that control the development and plasticity of nerve cell circuits, and how these pathways are altered in aging and neurological disorders. Examples include: the mechanisms regulating neural stem cells; neurotrophic factor signaling; adaptive stress response pathways; cellular calcium homeostasis; and pathways that modify energy metabolism and oxidative stress. Using animal models, LNS investigators are discovering how factors such as dietary energy intake and exercise affect the brain during aging, and they are developing and testing novel drugs that preserve or enhance brain function using animal models.

Laboratory of Behavioral Neuroscience (LBN)
The LBN conducts basic and clinical research on individual differences in cognition, personality, and affect; investigates the cellular, neural systems and genetic contributions to variation between individuals in animal models and humans; examines predictors and modifiers of age-related neurodegenerative diseases and age-associated changes in behavior, predispositions, and brain-behavior associations; identifies early markers of Alzheimer's disease and cognitive decline and examines factors that promote the maintenance of cognitive health, and develops; and validates biomarkers of age-related neurodegeneration to inform diagnosis and therapeutic interventions. Laboratory investigators employ a variety of approaches, including experimental, longitudinal, neuroimaging, biomarker, neuropathological, electrophysical, anatomical, molecular and genetic methods in the analysis of biological and psychological aspects of aging.

Translational Gerontology Branch (TGB) The research efforts of TGB are focused on improving the health and wellbeing of the elderly population through epidemiological, clinical, and basic research programs, with a special emphasis on longitudinal observations and intervention studies. The TGB is investigating and developing novel strategies and interventions to support healthy aging and the prevention, or delay, of functional decline and age-related diseases. The main research goals of the TGB are to: 1) translate discoveries made from human and model organisms to the basic biology (and vice versa), mainstreaming the "bench to bedside to bench" approach; 2) explore and identify the underlying molecular mechanisms responsible for the functional decline that occurs with age, and 3) develop and test interventions to delay aging processes.

Extramural Research

Division of Extramural Activities (DEA)

DEA manages NIA's grants and training policies and procedures, including oversight of grants and contract administration, scientific review, and committee management functions. It serves as primary liaison for NIA with the NIH Office of Extramural Research and with other Institutes that share research interests. NIA's extramural training programs, career development programs, small business initiatives, and other special programs are managed by DEA. The Division handles scientific integrity and ethical questions in research and manages the National Advisory Council on Aging.

The *Scientific Review Branch* (SRB) conducts initial peer review of specific research applications assigned to the NIA. These include applications for Centers, program projects, scientific meetings, and training and career development as well as applications responding to initiatives published by NIA. External peer reviewers conduct the reviews.

The *Grants and Contracts Management Branch* (GCMB) works with scientists and institutional research administrators to issue, manage, and close out awards. The branch has legal responsibility for the fiscal management of the Institute's extramural grants and contracts.

National Advisory Council on Aging (NACA)

Congress created the National Advisory Council on Aging (NACA) "to advise, consult with, and make recommendations to the Secretary, HHS, the Assistant Secretary for Health; the Director, NIH; and the Director, NIA on matters relating to the conduct and support of biomedical, social, and behavioral research, training, health information dissemination, and other programs with respect to the aging process and the diseases and other special problems and needs of the aged."

The NACA consists of 18 members appointed by the HHS Secretary and 5 non-voting *ex officio* members. Of the 18 appointed members, 12 are leading representatives of the health and scientific disciplines and are leaders in the fields of public health and the behavioral or social sciences relevant to the activities of the NIA, particularly with respect to biological and medical sciences relating to aging and public health. Six of the members are leaders from the general public in the fields of public policy, law, health policy, economics, and management. The NACA meets 3 times each year.

Division of Aging Biology (DAB)

The DAB plans and supports molecular, cellular, genetic and systems biology research on the mechanisms of aging and age-related conditions through various NIH grant mechanisms and contracts. It also supports biological resource facilities that provide aged animals and banked tissues for use in aging research. The overall goal is to provide a basis for development of preventative and interventional strategies to extend healthy aging. The DAB includes the following programs:

Animal Models supports comparative biology research and development of new animal models for aging research. Current models include rats, mice, birds, fish, rabbits, nonhuman primates, insects, nematodes, various other invertebrates and yeasts, with rodent models of particular interest.

Biological Resources manages biological resources through contracts. It coordinates the aged non-human primate resources and the Intervention Testing Program (ITP), a multi-institutional study conducting research on non-genetic interventions to delay aging in a mouse model.

Cardiovascular Biology supports investigations on the molecular and cellular changes that lead to age-related declines in cardiac and vascular function. Aging is itself the major risk factor for heart disease.

Cell Biology supports research on the age-related changes in cell physiology in microenvironments, cellular senescence, apoptosis, autophagy, cancer, cell-autonomy, cellular structures, signaling mechanisms, and protein homeostasis that might contribute to aging phenotypes.

Endocrinology supports basic research into the causes and effects of age-related changes in the endocrine system, and on aging-dependent changes in cellular responses to endocrine factors.

Genetics supports studies to identify and characterize genes and pathways affecting longevity; genome stability; telomere biology; genomics; epigenomics; and progeroid syndromes, all in relation to healthy aging.

Immunology supports studies on changes in the immune systems of older people that may contribute to the increased incidence of infection including regulation of lymphocyte proliferation, immune specificity, autoimmune disease and other immunopathologies, endocrine control of immune function and interventions to retard and/or correct age-related decline in immune function.

Metabolic Regulation supports research on nutrition and metabolism in relation to aging including age-related changes in intermediary metabolism; mitochondrial (dys) function, and mechanisms by which caloric restriction; free radicals and oxidative stress affect lifespan.

Musculoskeletal Biology supports studies on muscle, bone and cartilage that may have negative effects on health of the elderly (e.g., causes of osteoporosis or sarcopenia).

Stem Cells supports research on changes in stem cells (SC) and SC niches during aging. The emphasis is on identification of factors altering SC function with aging, and the roles of SC both in normal tissue homeostasis and injury.

Tissue Physiology supports investigation of age-related changes that affect the function of liver, digestive, renal, and pulmonary systems.

Division of Behavioral and Social Research (BSR)

This division supports research and research training on the processes of aging at both the individual and societal level. It focuses on how people change over the adult life course and on the societal impact of the changing age-composition of the population. BSR fosters research that reaches across disciplinary boundaries, from genetics to comparisons across national populations, and at stages from basic through translational.

BSR has two branches, with substantial interactions between them:

The Individual Behavioral Processes Branch supports research and research training on health and behavior, cognitive and emotional functioning, technology and human factors, and integrative approaches to the study of social, psychological, genetic, and physiological influences on health and well-being over the life course. Research that takes a life course perspective is especially encouraged. Its research focus includes:

- Behavioral Medicine and Interventions focuses on the dynamic interrelationships among aging, health, and behavior, expanding traditional studies in behavioral medicine by adding an aging perspective as well as behavioral emphasis on the influence of the socio-cultural environment on the development and maintenance of a wide range of health and illness behaviors.
- *Behavioral and Population Genetics of Aging* examines links among social, psychological, and behavioral processes to health and well-being over the life course, through the study of gene-environment interplay. This includes the study of epigenetics, gene-by-environment interaction and gene-environment correlation and explores the integration of genetic methods into population-based research and population genetics of aging.
- *Cognitive Aging* supports studies on changes in cognitive functioning over the life course. Studies are encouraged that: 1) examine the influence of contexts (behavioral, social, cultural, and technological) on the cognitive functioning of aging persons; 2) investigate the effects of age-related changes in cognition on activities of daily living, social relationships, and health status; and 3) develop strategies for improving everyday functioning through cognitive interventions. Major topics include higher-order cognitive processes (such as executive function, problem-solving, decision-making, consumer behavior, diving, and health literacy), memory strategies, perceptual skills, and reading and speech comprehension. Research also explores the role of individual differences in cognitive functioning (e.g., motivation, self-efficacy, beliefs about aging, emotions, sensory limitations, experience, and expertise) and health disparities, collaborating with the NIA Division of Neuroscience to encourage research at the intersection of behavior and neurocognition.

Psychological Development and Integrative Science applies an integrative and life course approach to the study of personality, emotion, subjective well-being, motivation, self-regulation, social behaviors, social relationships, social cognition, stress and resilience. This includes research combining multiple levels of analysis (e.g., psychological, behavioral, social, neurobiological, neuroendocrine, genetic) and examines reciprocal interactions among these levels, as in the areas of social and affective neuroscience, behavioral and neuroeconomics, health psychology and psychosomatic medicine.

The *Population and Social Processes Branch* supports research and research training on the causes and consequences of changes in social, demographic, economic, and health characteristics of the older population. Research on the effects of public policies, social institutions, and health care settings on the health, well-being, and functioning of people—both over the life course and in later years—is supported. International and comparative studies are encouraged, as are interconnections with individual behavioral processes. Interdisciplinary and multi-level research is strongly encouraged.

- *Demography and Epidemiology* fosters research on trends in functioning, disability, morbidity, and mortality; age trajectories of health; life expectancy and active life expectancy; causes and consequences of changes in the age-structure of populations; interactions between health and socioeconomic status over time and across generations; the effect on health of social networks and social contexts; interrelationships between work, family, and health; and cohort analyses of aging. Epidemiologic studies deal with the dynamics of disability and frailty, and the identification and evaluation of strategies and interventions to promote health.
- *Economics of Aging* encourages research on the reciprocal relationships between health and work at older ages; consequences of retirement for health and functioning; effects of aging on economic behaviors; health insurance and health care expenditures; interrelationships between health and economic status; the costs of disability; and the cost-effectiveness of interventions to improve the health and well- being of the elderly. Research also deals with implications of population aging for public and private retirement and health insurance programs for income security of future retirees; the allocation of family resources across generations, and determinants of retirement and saving.
- *Health and long-term Care Systems* encourages research on the impact of formal health care and long-term care systems and settings on the health and well-being of older persons. Topics include transitions among settings; hospital-level and regional differences in intensity of care, and end-of-life care trajectories.

Division of Geriatrics and Clinical Gerontology (DGCG)

The DGCG supports research on health and disease in older people and research on aging over the human lifespan, including its relationships to health outcomes. DGCG comprises three major research areas, divided into three division branches—Geriatrics, Clinical Gerontology, and Clinical Trials. Program-wide emphases include research training and career development to attract new investigators to the field of aging and to further the development of active investigators in clinical medicine and biomedical research, and the application of new technologies to expand opportunities for clinical aging research.

Geriatrics focuses on health issues regarding older people. Research emphases include multifactorial geriatric syndromes such as falls, frailty, and various types of disability; effects of comorbidity and polypharmacy; effects of age-related changes on clinical or functional disease outcomes or treatment responses; effects of physical activity on disease and disability in older persons; and the elucidation, diagnosis, and treatment of previously unappreciated pathologic changes in old age (e.g., sarcopenia, vascular stiffening, diastolic dysfunction). The Geriatrics Branch supports the Claude D. Pepper Older Americans Independence Centers (OAICs). The OAICs conduct basic and clinical research to enhance the ability of older people to maintain their independence.

Clinical Gerontology focuses on clinically related research on aging changes over the lifespan. Research emphases include healthy aging across the lifespan (including exceptional longevity); protective factors against multiple age-related conditions; determinants of rates of progression of age-related changes that affect disease risk, particularly those for multiple age-related conditions; menopause and mid-life aging changes; translational human research to follow up findings from basic research on aging; long-term effects of current or new interventions that may be administered over a large part of the lifespan; and long-term effects of physical activity throughout the lifespan.

Clinical Trials plans and administers clinical trials on age-related issues. Research emphases include interventions to prevent or treat “geriatric syndromes,” disability, and complications of comorbidity or polypharmacy; trials to detect age- or comorbidity-related differences in responses to interventions against conditions found in middle age and old age; interventions for problems associated with menopause and other mid- and late-life changes; interventions that may affect rates of progression of age-related declines in function in early and mid-life; and interventions with protective effects against multiple age-related conditions, including intervention studies on the effects of androgens in older men.

Division of Neuroscience (DN)

Organized into three separate branches, this division fosters and supports extramural and collaborative research and training to further the understanding of neural and behavioral processes associated with the aging brain. Research on dementias of old age—in particular Alzheimer's disease—is one of the division's highest priorities.

The *Neurobiology of Aging Branch* fosters research aimed at understanding how the nervous system is affected by normal as well as pathological aging. *Fundamental Neuroscience* supports studies on age-related structural and functional changes in brain, cell death mechanisms and selective vulnerability to aging, molecular genetics of brain aging bioenergetic processes, systemic metabolism, cerebrovasculature, glia, neural plasticity, neural stem cells, and neurogenesis. In *Integrative Neurobiology*, the focus is on age-related research on neural mechanisms underlying changes between organ systems and the CNS, in endocrine and immune functions, and neurodegenerative diseases associated with infectious agents including prions. *Sleep and Biological Rhythm* encompasses age-related studies of epidemiology, etiology, pathogenesis, diagnosis, treatment, and prevention of sleep disorders of older people; sleep-wake cycles/disordered biorhythmicity and behavioral effects in the aged.

The *Dementias of Aging Branch* supports studies of etiology, pathophysiology, genetics, epidemiology, clinical course, diagnosis and functional assessment, drug discovery and development, behavioral management, and clinical trials in the dementias of later life, especially Alzheimer's disease. In *Basic Research*, it supports examination of molecular, cellular, genetic, systemic, and systems aspects involved in the etiology of Alzheimer's disease and other dementias of aging. *Population Studies* are supported in the epidemiology of cognitive decline, mild cognitive impairment (MCI), and Alzheimer's disease. A *Clinical Studies* focus on the diagnosis, treatment, and management of patients with cognitive decline, MCI, or Alzheimer's disease pharmacological and behavioral is also important. Here, research is aimed at the development and evaluation of reliable and valid multidimensional procedures including and other biomarkers and clinical and neuropsychological instruments for diagnosis, progression, and response to treatment. The maintenance of a research infrastructure is critical, and the *Research Centers* component of this branch supports Alzheimer's Disease Research Centers and Alzheimer's Disease Center Core programs, that provide a multifaceted approach to research, training, and educational activities on Alzheimer's disease and several multi-center collaborative research projects.

The *Behavioral and Systems Neuroscience Branch* emphasizes research on the neural and psychological mechanisms underlying age-related changes in cognition, emotion, sensory and motor function, from the level of genes to the whole organism, and epidemiological studies of populations. Studies of molecular, structural, and dynamic brain changes, including research on adaptation or plasticity, are of particular interest, as well as interventions to maintain or gain function in older age. A focus on *Sensory Processes* supports studies on mechanisms of normal aging and disease-related alterations in visual, auditory, somatosensory, vestibular, and chemosensory functions. In an effort to understand *Motor Function*, research is supported on proprioception, postural control, sensory motor integration, vestibular, and movement disorders in aging, including Parkinson's disease. Efforts in *Cognitive and Affective Neuroscience* look at cognitive processes, including learning, memory, attention, and language as well as the neurobiology of age-related changes in emotion. Understanding and treating age-related cognitive decline are emphasized. The investigation of the relationship of age-related cognitive dysfunction associated with delirium and dementia is also of interest. The Division of Neuroscience and this branch, in particular, interact and collaborate with the Division of Behavioral and Social Research where psychological science and behavioral neuroscience converge.

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

National Institute on Alcohol Abuse and Alcoholism

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MISSION

The mission of the National Institute on Alcohol Abuse and Alcoholism (NIAAA) is to provide leadership in the national effort to reduce alcohol-related problems by:

- Conducting and supporting research in a wide range of scientific areas including genetics, neuroscience, epidemiology, health risks and benefits of alcohol consumption, prevention, and treatment;
- Coordinating and collaborating with other research institutes and Federal Programs on alcohol-related issues;
- Collaborating with international, national, state, and local institutions, organizations, agencies, and programs engaged in alcohol-related work; and
- Translating and disseminating research findings to health care providers, researchers, policymakers, and the public.

The Institute's efforts to fulfill its mission are guided by the NIAAA vision to support and promote, through research and education, the best science on alcohol and health for the benefit of all by:

- Increasing the understanding of normal and abnormal biological functions and behavior relating to alcohol use;
- Improving the diagnosis, prevention, and treatment of alcohol use disorders; and
- Enhancing quality health care.

Research opportunities to increase our understanding of why, how, and when people drink, and why and how some people develop alcohol use disorders, are set forth in the *NIAAA Strategic Plan for Research,* available on the NIAAA Web site at www.niaaa.nih.gov.

IMPORTANT EVENTS IN NIAAA HISTORY

1970—The Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment, and Rehabilitation Act was passed, establishing NIAAA as part of the National Institute of Mental Health (NIMH). Senator Harold E. Hughes of Iowa played a pivotal role in sponsoring the legislation, which recognized alcohol abuse and alcoholism as major public health problems.

1971—The First Special Report to the U.S. Congress on Alcohol and Health was issued in December, part of a series of triennial reports established to chart the progress made by alcohol research toward understanding, preventing, and treating alcohol abuse and alcoholism.

1974—NIAAA became an independent institute within the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA), which also housed NIMH and the National Institute on Drug Abuse (NIDA).

1977—NIAAA organized the first national research workshop on fetal alcohol syndrome (FAS), which reviewed the state of the research on FAS.

1980—NIAAA science and staff were instrumental to the development of the *Report to the President and the Congress on Health Hazards Associated with Alcohol and Methods to Inform the General Public of these Hazards*; this report influenced the following year's publication of the U.S. Surgeon General's Advisory on Alcohol and Pregnancy of 1981 (updated in 2005).

1989—NIAAA launched the Collaborative Studies on Genetics of Alcoholism with the goal of identifying the specific genes underlying vulnerability to alcoholism as well as collecting clinical, neuropsychological, electrophysiological, and biochemical data, and establishing a repository of immortalized cell lines.

1991—NIAAA began the National Longitudinal Alcohol Epidemiologic Survey, designed to study drinking practices, behaviors, and related problems in the general public.

1995—NIAAA celebrated its 25th anniversary.

1996—NIAAA established the Mark Keller Honorary Lecture Series. The series pays tribute to Mark Keller, a pioneer in the field of alcohol research, and features a lecture each year by an outstanding alcohol researcher who has made significant and long-term contributions to our understanding of alcohol's effects on the body and mind. View image.

1999—NIAAA organized the first National Alcohol Screening Day, created to provide public education, screening, and referral for treatment when indicated. The program was held at 1,717 sites across the United States, including 499 college sites.

NIAAA co-sponsored the launch of *The Leadership to Keep Children Alcohol Free*, a unique coalition of State Governors' spouses, Federal agencies, and public and private organizations that targets prevention of drinking in young people ages 9- to 15-years old.

2001—NIAAA launched the 2001-2002 National Epidemiologic Survey on Alcohol and Related Conditions, a representative sample of the U.S. population with data on alcohol and drug use; alcohol and drug abuse and dependence; and associated psychiatric and other co-occurring disorders.

2002—NIAAA published *A Call to Action: Changing the Culture of Drinking at U.S. Colleges*, which was developed by the Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism as a comprehensive review of research on college drinking and the effectiveness of prevention programs.

2004—NIAAA established the Underage Drinking Research Initiative by convening, a steering committee of experts in adolescent development, child health, brain imaging, genetics, neuroscience, prevention research, and other research fields, with the goal of working towards a more complete and integrated scientific understanding of the environmental, biobehavioral, and genetic factors that promote initiation, maintenance, and acceleration of alcohol use among youth, framed within the context of human development.

2004—FDA approved acamprosate, a drug that eases negative effects related to alcohol withdrawal. In 1994, the FDA approved naltrexone, a drug that can reduce alcohol craving. In 2006, FDA approved an injectable long-lasting version of naltrexone. Prior to approval of these drugs, the only medication physicians could offer to patients who were battling alcohol abuse and dependence was disulfiram, which had been approved for the treatment of alcoholism in 1949. Disulfiram increases the concentration of acetaldehyde in the body, which can cause unpleasant symptoms; anticipation of these effects can help some people avoid drinking.

2005—NIAAA published *Helping Patients Who Drink Too Much: A Clinician's Guide* to help primary care and mental health clinicians incorporate alcohol screening and intervention into their practices. The 2005 edition introduced a simple one-question screening tool that streamlined recommendations published in earlier NIAAA guides.

2005—The Surgeon General releases the *Surgeon General's Advisory on Alcohol Use in Pregnancy*, updated from the original advisory released in 1981. As with the 1981 report, NIAAA science contributed significantly to the development of this document, and NIAAA staff were instrumental in its crafting.

2007—NIAAA partnered with NIDA, the Robert Wood Johnson Foundation, and HBO to produce *Addiction*, an Emmy-award winning documentary exploring alcohol and drug addiction, treatment, and recovery, and featuring interviews with medical researchers working to better understand and treat addictive disorders.

2008—The Acting Surgeon General of the United States issued *The Surgeon General's Call to Action To Prevent and Reduce Underage Drinking*. NIAAA's Underage Drinking Research Initiative provided much of the scientific foundation for that document.

2008—NIAAA published a special supplemental issue of the journal *Pediatrics*, presenting a developmental framework for understanding and addressing underage drinking as a guide to future research, prevention, and treatment efforts. The research reflected in these articles contributed to the development of *The Surgeon General's Call to Action To Prevent and Reduce Underage Drinking*.

2010—NIAAA celebrated the 40th anniversary of its founding on December 31, 1970. In addition to placing vibrant anniversary banners across the NIH campus, NIAAA published a special double issue of its peer-reviewed journal, *Alcohol Research & Health*. This anniversary issue describes the Institutes' public health impact and multidisciplinary contributions to alcohol research. Additionally, on October 4, 2010, the Institute hosted a special symposium recognizing the 40th anniversary. At this symposium, leaders in the field discussed the ways in which alcohol research has evolved over the past 40 years, as well as NIAAA's role in this progress.

2011—NIAAA released *Alcohol Screening and Brief Intervention for Youth: A Practitioner's Guide*, Developed in collaboration with the American Academy of Pediatrics, clinical researchers, and health practitioners, the guide introduces a two-question screening tool and an innovative youth alcohol risk estimator to help clinicians overcome time constraints and other common barriers to youth alcohol screening.

2012—NIH announces the Trans-NIH Substance Use, Abuse, and Addiction Functional Integration that will enhance the NIH Institute and Center collaborations around this important scientific and public health topic. The Functional Integration is a collaborative framework that will draw on the collaboration among the NIH ICs on substance use, abuse, and addiction-related research. NIAAA and the National Institute on Drug Abuse have made significant progress at integrating their intramural research programs in substance use, abuse, and addiction, including the appointment of a single Clinical Director for both Institutes and the establishment of a joint genetics Intramural Research Program and a common Optogenetics lab. By pooling resources and expertise, the Functional Integration will identify cross-cutting areas of research and confront challenges faced by multiple Institutes and Centers.

LEGISLATIVE CHRONOLOGY

December 31, 1970—NIAAA was established under authority of the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment, and Rehabilitation Act of 1970 (Public Law 91-616) with authority to develop and conduct comprehensive health, education, training, research, and planning programs for the prevention and treatment of alcohol abuse and alcoholism.

May 14, 1974—P.L. 93-282 was passed, establishing NIAAA, NIMH, and NIDA as coequal institutes within the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA).

July 26, 1976—NIAAA's research authority was expanded to include behavioral and biomedical etiology of the social and economic consequences of alcohol abuse and alcoholism under authority of the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment, and Rehabilitation Act amendments of 1976 (P.L. 94-371).

August 1981—The Omnibus Budget Reconciliation Act of 1981 (P.L. 97-35) was passed, transferring responsibility and funding for alcoholism treatment services to the states through the creation of an Alcohol, Drug Abuse, and Mental Health Services block grant administered by ADAMHA and strengthening NIAAA's research mission.

October 27, 1986—A new Office for Substance Abuse Prevention in ADAMHA was created through the Anti-Drug Abuse Act of 1986 (P.L. 99-570), which consolidated the remainder of NIAAA's nonresearch prevention activities with those of NIDA and permitted NIAAA's total commitment to provide national stewardship to alcohol research.

July 10, 1992—NIAAA became a new NIH research institute under the ADAMHA Reorganization Act of 1992 (P.L. 102-321).

December 20, 2006—The Sober Truth on Preventing Underage Drinking Act (P.L. 109-422) was passed, requiring the Secretary of Health and Human Services to formally establish and enhance the efforts of the Interagency Coordinating Committee on the Prevention of Underage Drinking that began operating in 2004.

BIOGRAPHICAL SKETCH OF NIAAA DIRECTOR KENNETH R. WARREN, PH.D. (ACTING)

Kenneth R. Warren, Ph.D., a nationally-recognized expert on alcohol and pregnancy, and a long-time senior administrator at the National Institute on Alcohol Abuse and Alcoholism (NIAAA) became Acting Director of NIAAA on November 1, 2008, following the retirement of Ting-Kai Li, M.D. on October 31, 2008. Dr. Li had served as NIAAA Director from November 2002 through October 2008.

Dr. Warren was named NIAAA Deputy Director in February 2008 and he has served Acting Director of the Institute from November 2008 until the present. He joined NIAAA in 1976 as a staff member of the then Division of Research. He later became chief of the Biomedical Research Branch, and then deputy director of the Division of Extramural Research. From 1984 to 2005 he directed the Office of Scientific Affairs, whose responsibilities included peer review, grants management, committee management, scientific communications, and activities of the NIAAA National Advisory Council and Extramural Advisory Board. From 2002 to 2007, Dr. Warren served as Associate Director for Basic Research.

A graduate of the City College of New York, Dr. Warren earned his doctorate degree in Biochemistry from Michigan State University in 1970. He subsequently undertook postdoctoral positions at the University of California, Los Angeles and at University of Michigan Mental Health Research Institute before joining the Federal government in a research position at the Walter Reed Army Institute of Research in 1974.

Dr. Warren has maintained an active interest in all areas of alcohol and health and in past years often served as the editor of the triennial *Reports to Congress on Alcohol and Health*. He has been particularly active in research on the effects of alcohol use during pregnancy, including fetal alcohol syndrome (FAS) and fetal alcohol spectrum disorders (FASD). Dr. Warren initiated NIAAA's research program on FAS over 30 years ago. He currently chairs the government-wide Interagency Coordinating Committee on FAS.

Dr. Warren has received numerous honors, including a superior service award from the Public Health Service in 1982 for his work in development of the first Surgeon General's Advisory on FAS. In 1994, Dr. Warren received the Seixas Award from the Research Society on Alcoholism (RSA). In 2002, he received the Henry Rosett Award from the Fetal Alcohol Syndrome Study Group of RSA. In 2007, the National Organization on Fetal Alcohol Syndrome (NOFAS) honored Dr. Warren by placing his name into its Tom and Linda Daschle FASD Hall of Fame, and awarded him the NOFAS Excellence Award in 2008.

NIAAA DIRECTORS

Name	In Office from	To
Morris E. Chafitz	1972	September 1, 1975
Ernest P. Noble	February 1976	April 1978
Loran Archer (Acting)	April 1978 November 1981 January 1986	April 1979 July 1982 October 1986
John R. DeLuca	May 1979	October 1981
William E. Mayer (Acting)	August 1982	July 1983
Robert G. Niven	August 1983	December 1985
Enoch Gordis	November 1986	January 2002
Raynard Kington (Acting)	January 2002	November 2002
Ting-Kai Li	November 2002	October 2008
Kenneth R. Warren (Acting)	November 2008	Present

DIVISIONS AND OFFICES

Office of the Director

The Office of the Director leads the Institute by setting research and programmatic priorities and coordinating cross-cutting initiatives. The Office includes:

- **Office of Extramural Activities, Director: Dr. Abraham Bautista**
  The Office of Extramural Activities is responsible for extramural grant and contract review, the management of chartered initial review groups and special emphasis panels, and all grants management activities. OEA also manages the Committee Management Office—responsible for advisory council activities and nominations to advisory and review panels—and provides advice to the Institute's senior leadership on matters that concern FACA (Federal Advisory Committee Act) and non-FACA meetings.
- **Office of Science Policy and Communications, Director: Dr. Vivian Faden**
  The Office of Science Policy and Communications is responsible for science policy, planning, evaluation and reporting functions for NIAAA; the preparation of briefing materials on alcohol research; and responses to Freedom of Information Act requests. Additionally, the office also coordinates all media relations, produces materials for scientific and lay audiences, and acts as the public face of the Institute.
- **Office of Resource Management, Director: Mr. Keith Lamirande**
  The Office of Resource Management provides administrative management support to the Institute in the areas of financial management, grants and contracts management, administrative services, and personnel operations; develops administrative management policies, procedures, guidelines, and operations; maintains liaison with the management staff of the Office of the Director; and implements within the Institute general management policies prescribed by NIH and higher authorities.

Intramural Research

The overall goal of NIAAA's Division of Intramural Clinical and Biological Research is to understand the mechanisms by which alcohol produces intoxication, dependence, and damage to vital body organs, and to develop tools to prevent and treat those biochemical and behavioral processes. The cellular and molecular processes relevant to the actions of alcohol are also subject to our studies. Areas of study include identification and assessment of genetic and environmental risk factors for the development of alcoholism; the effects of alcohol on the central nervous system, including mechanisms of neuroplasticity and neural functions that underlie addictive behavior; metabolic and biochemical effects of alcohol on various organs and systems of the body; noninvasive imaging of the brain structure and activity related to alcohol use; development of animal models of alcoholism; conducting epidemiologic research on alcohol use, abuse, and dependence; and the diagnosis, prevention, and treatment of alcoholism and associated disorders.

NIAAA uses a combination of clinical and basic research facilities, which enable a coordinated interaction between basic research findings and clinical applications in pursuit of these goals. An inpatient unit and an outpatient program are located in the NIH Clinical Research Center in Bethesda, Maryland.

NIAAA intramural researchers investigate a number of areas, including:

- genetic studies investigating, identifying, and characterizing genes that contribute to individual susceptibility to alcoholism and alcohol-related behaviors;
- translational studies aimed to identify novel molecular targets of alcohol in the brain and to develop/test novel compounds that interact with such targets for the treatment of alcohol use disorders;
- studies seeking a better understanding of the underlying factors of alcoholic liver disease;
- national surveillance activities to collect, analyze, and report epidemiological data on alcohol use, abuse, and dependence, and their associated disabilities;
- behavioral and neurophysiological studies to understand the mechanisms of the motivation to drink and the factors that influence it; and
- studies to determine how alcohol interacts with nerve cells and the brain's signaling system to improve our understanding of the molecular basis of alcohol dependence and lead to development of treatments and prevention strategies.

Extramural Research

Division of Epidemiology and Prevention Research

NIAAA's Division of Epidemiology and Prevention Research (DEPR) seeks to reduce alcohol-related mortality and morbidity and other alcohol-related problems and consequences through the integration and application of epidemiology and prevention science by setting research priorities; stimulating and supporting research, training, and career development; conducting research and publishing in the scientific literature; promoting dialogue and collaboration between DEPR and other organizations; contributing to alcohol-related surveillance; and disseminating scientific information.

Two major areas of focus for the Division are:

1. the epidemiology of alcohol use and alcohol-related problems, a broad area that includes the study of the following:
   - the etiology (investigating the origins and causes, including risk factors and protective factors) and the course of alcohol-related problems, including alcohol use disorders (AUDs);
   - the relationship of alcohol consumption and AUDs to unintentional and intentional injuries and other diseases and disorders (such as co-occurring psychiatric disorders as well as diabetes, cardiovascular disease, cancer, liver disease, and other chronic diseases), alcohol's relationship to HIV/AIDS and other sexually transmitted diseases; the potential health benefits of alcohol consumption; and
   - alcohol-related consequences (including mortality and morbidity, violence, risky and unprotected sex, compromised academic/vocational achievement, and the economic costs of alcohol).
2. the prevention of alcohol-related problems, a broad area that includes the study of the following:

- the efficacy and effectiveness of screening and brief interventions, family-, school-, web-, and employment-based prevention interventions, as well as comprehensive/community prevention interventions and drinking-driving countermeasures; and
- the impact of alcohol and other public policy, the media, and alcohol marketing and promotion.

Division of Metabolism and Health Effects

Chronic alcohol use affects every organ and system of the body. It also can lead to medical disorders (e.g., fetal alcohol spectrum disorders, liver disease, cardiomyopathy, pancreatitis, and cancer) throughout the lifespan—from early development to adolescence and adulthood—and contribute to the suppression of immune and endocrine functions. Heavy alcohol use also exacerbates tissue injury due to co-morbid conditions, such as hepatitis C, osteoporosis, obesity, type 2 diabetes, and increases the risk for certain cancers. NIAAA's Division of Metabolism and Health Effects (DMHE) supports a wide range of research to elucidate the genetic, epigenetic, metabolic, and immunologic mechanisms of alcohol-induced tissue injury that contribute to the initiation and progression of these disorders.

The division supports basic and clinical research studies to identify the molecular pathways through which alcohol causes organ and tissue damage, with the goal of identifying targets for drug discovery to prevent or treat alcohol-related disorders. The potential for tissue repair and regeneration following tissue damage due to chronic heavy drinking is being explored through stem cell therapy, gene targeting, and pharmacogenomics. Multidisciplinary research and systems biology approaches are also used to study mechanisms of alcohol action and injury.

DMHE supports metabolic research on enzymes, proteins, substrates, substrate adducts, co-factors, vitamins, nucleic acids, sugars, and other metabolites that may be affected by alcohol or alcohol by-products. Other basic investigations seek to identify biomarkers for the early stages of disease using genomic, proteomic, and metabolomic approaches that will facilitate early identification and treatment before diseases become irreversible. Recent initiatives developed by DMHE staff have supported research into the etiology and treatment of alcoholic hepatitis and the relationship between alcohol use and cancer. DMHE also supports research to elucidate the mechanism of alcohol's potential beneficial effects, including studies related to cardiovascular disease, diabetes, and certain inflammatory diseases.

Division of Neuroscience and Behavior

The Division of Neuroscience and Behavior (DNB) promotes research on ways in which neuronal and behavioral systems are influenced by genetic, developmental, and environmental factors in conjunction with alcohol exposure to engender alcohol abuse and alcoholism. A primary goal is to support investigations into neural and behavioral processes promoting the initiation and maintenance of drinking, as well as enduring changes in the brain resulting from long-term alcohol exposure that drive excessive alcohol drinking. The program includes studies on basic mechanisms of alcohol action on intracellular signaling pathways, neuronal membrane structure and function, ion channels and receptors, and the physiology of neurotransmission. Another goal is to identify and characterize the neural and cognitive consequences of acute, binge, and chronic alcohol exposure.

To address these goals, DNB supports three major collaborative multidisciplinary programs. The Collaborative Study of the Genetics of Alcoholism (COGA) seeks to identify the role of genes in susceptibility to (or protection from) developing alcohol dependence and related phenotypes. The ultimate goal is to understand the functional effects of variation at genes identified in these studies, including effects on expression, at the molecular and cellular level. The Integrative Neuroscience Initiative on Alcoholism (INIA), a consortium investigating the mechanisms that underlie neuroadaptation to alcohol, integrates neurobiological, behavioral, and molecular genetic research and provides opportunities for scientific collaboration. Major themes explored in this program include the role of stress in phenotypes related to alcohol dependence and the identification of druggable targets for potential pharmacotherapies. The Neurobiology of Adolescent Drinking in Adulthood (NADIA) supports a consortium of highly integrated multidisciplinary research efforts across different research institutions to elucidate persistent changes in complex brain function–behavior relationships following adolescent alcohol exposure using animal models.

In addition to these collaborative programs, DNB supports research on the molecular, genetic, cellular, and neural mediators of alcohol dependence, tolerance, sensitization, withdrawal, and relapse. This research includes developing animal models that will increase our understanding of the acute and chronic effects of alcohol exposure. DNB's preclinical medication research program seeks to identify compounds that reduce alcohol drinking or alleviate adverse conditions prompting relapse. The goal of this program is to test the potential therapeutic efficacy of new and existing compounds and discover their therapeutic mechanism of action. In addition, DNB supports basic behavioral research that applies concepts from psychological science to understanding alcohol dependence and related problems.

Areas of particular interest include:

- the consequences of alcohol use during pregnancy that produce fetal alcohol spectrum disorders;
- the effects of alcohol drinking on the adolescent brain and throughout the lifespan;
- targets for preclinical medication development;
- cognitive and psychological processes involved in regulating alcohol drinking and the acquisition of drinking problems;
- genes and gene networks involved in alcohol drinking and alcohol withdrawal effects and their contribution to the development of alcohol dependence;
- phenotypes related to alcohol dependence such as impulsivity, anxiety and depression.

Division of Treatment and Recovery Research

NIAAA's Division of Treatment and Recovery Research supports research to better understand the natural history of heavy drinking and alcohol use disorders and factors associated with positive change. One priority is to better understand mechanisms of behavioral change, both for change occurring naturally as well as within the context of mutual help groups and professional treatment. There is also a need to develop and test models of disease management for chronic alcohol use disorders, especially for people who also have serious medical or mental disorders.

Another priority is to develop medications that reduce risk of relapse and prevent or reverse alcohol-induced tissue damage. Alcohol dependence is a complex disorder involving many neurotargets in regulating alcohol-seeking and drinking behavior, including multiple neurotransmitters and neuromodulators. Thus, the

division is exploring a range of medications to improve treatment outcomes. Several medications are at various stages of development, ranging from preclinical research to clinical application, for the treatment of alcohol dependence.

Health services research is also an important focus for the division. Current priorities include health economics research, research on stigma and help-seeking behavior, and research on implementation of evidence-based practices and quality improvement in treatment settings.

Trans-Divisional Program Activity

NIAAA intramural and extramural staff engage in cross-cutting program activities to address the inherently interdisciplinary nature of alcohol research. NIAAA's Trans-Divisional Research Emphasis and Resource Development teams, working groups, and committees focus on biomarkers; centers and training programs, fetal alcohol spectrum disorders; gene-environment studies; HIV/AIDS; health disparities and minority research; informatics and computational/systems biology; international research; mechanisms of behavioral change; medications development; research resources and technology; and underage drinking.

Examples of cross-institute activity include the following:

Fetal Alcohol Spectrum Disorders Research

NIAAA is the lead Federal agency for research on how alcohol consumption during pregnancy results in adverse consequences for the fetus, the most serious of which is fetal alcohol syndrome. This developmental disorder is characterized by reduced growth; facial abnormalities; and neurological, cognitive, and behavioral impairment. NIAAA chairs the Interagency Coordinating Committee on Fetal Alcohol Syndrome, created in 1996 in response to an Institute of Medicine report. In 2003, NIAAA launched the Collaborative Initiative on Fetal Alcohol Spectrum Disorders, a cooperative agreement program to improve diagnosis and develop effective treatment approaches through highly integrated, multidisciplinary research projects at both domestic and international sites. Also in 2003, NIAAA and the National Institute on Child Health and Human Development established the Prenatal Alcohol, SIDS, and Stillbirth (PASS) Research Network to determine the underlying causes of sudden infant death syndrome (SIDS) and stillbirth and the role played by prenatal alcohol exposure.

International Programs

Alcohol use disorders are significant global health problems, and NIAAA has an ongoing program of international collaborative research to facilitate improved knowledge and care in this area. Much of the international research cooperation is carried out under formal "letters of intent" that are signed by the NIH and/or NIAAA Director and the heads of public and university medical research centers in foreign countries. For example, NIAAA has an active program of scientific exchange with the French Institut National de la Santè et de la Recherche Mèdicale (INSERM), and has signed letters of intent to foster research cooperation and scientific exchange with the National Institute on Alcoholism in Japan; the Peking University Institute of Mental Health and the Institute of Nutritional Sciences in Bejing, China; the National Health Research Institute in Taiwan; and the South Korean Centers for Disease Control and Prevention.

Alcohol Research Centers Program

NIAAA's Alcohol Research Centers Program provides long-term support for interdisciplinary research that focuses on particular aspects of alcohol use disorders and alcohol-related problems. The program encourages outstanding scientists from many disciplines to provide a full range of expertise, approaches, and advanced technologies on aspects of alcohol abuse, alcoholism, or other alcohol-related problems. The program is interrelated with and complementary to all other research support mechanisms and scientific activities that investigate the causes, diagnosis, prevention, and treatment, consequences of alcohol abuse and alcoholism.

Trans-NIH Program Activity

NIAAA collaborates with other NIH institutes and centers to generate and support broad research initiatives (e.g., NIH Blueprint for Neuroscience Research). In addition, NIAAA staff share their scientific expertise with other NIH institutes and centers to advance medical science in all areas of human health. More information about these initiatives can be found at NIH's Trans-NIH Collaborations website. NIAAA and NIDA intramural scientists study addiction related issues at the inpatient unit and outpatient program located in the NIH Clinical Research Center in Bethesda, Maryland.

Intra-HHS Program Activity

NIAAA staff and scientists work with other HHS agencies (e.g., Centers for Disease Control, Substance Abuse and Mental health Services Administration) to support and disseminate scientific research that improves public health. More details about these collaborative activities are described at the Intra-Agency Collaborations Reporting System website.

Communications and Outreach Activities

NIAAA maintains a communications program aimed at informing health care practitioners, researchers, policy makers, and the general public about findings from supported research programs. Examples of communications products include:

- *Alcohol Screening and Brief Intervention for Youth: A Practitioner's Guide*, a screening tool and youth alcohol risk estimator for use by health professionals.
- *Helping Patients Who Drink Too Much—A Clinician's Guide*, and numerous other resources for health professionals
- *Alcohol Research: Current Reviews*, a peer-reviewed journal published three times a year
- the *Alcohol Alert* series, bulletins on research findings for health professionals published three times a year
- Public service announcements, videos, posters, brochures, pamphlets, fact sheets, Web pages, and other materials for the general public.
- Online resources—available on the NIAAA Web site, including:

- www.rethinkingdrinking.niaaa.nih.gov, a drinking pattern "checkup" worksheets for weighing pros and cons, making a change plan, and selecting strategies for cutting down or quitting; and calculators for estimating alcohol calories and spending, and the alcohol content of cocktails;www.spectrum.niaaa.nih.gov, an online webzine featuring the latest alcohol research news from within NIAAA and throughout the alcohol field;
- www.collegedrinkingprevention.gov, statistics, factsheets, and reports about college drinking the health consequences of alcohol misuse, campus alcohol policies, and other information for college students, administrators, and parents;
- www.TheCoolSpot.gov, quizzes, games, and graphics featuring messages about the risks of underage drinking and ways to resist peer pressure for middle school audiences;
- the Alcohol Policy Information System (APIS), state-by-state data on a wide variety of alcohol-related policies; and
- NIAAA Clinical Trials, links guiding patients and clinicians to NIAAA-sponsored research trials conducted at the NIH Clinical Center in Bethesda, Maryland, and at research centers across the country.

These sites and other resources can be found at www.niaaa.nih.gov.

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National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
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Recent Photos from the National Institute on Alcohol Abuse and Alcoholism (NIAAA)

2010 PHOTOS

In celebration of its 40-year anniversary, in 2010 NIAAA installed commemorative banners across the NIH campus.
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Presenters at the NIAAA 40th Anniversary Symposium, as well as NIAAA Acting Director, Dr. Kenneth R. Warren and past Director, Dr. Enoch Gordis. (Credit: Ernie Branson)
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2007 PHOTOS

Dr. Boris Tabakoff (right), professor and chairman in the Department of Pharmacology, University of Colorado School of Medicine, accepts the 2007 Mark Keller Honorary Award from NIAAA Director Dr. T.-K. Li. (Photo by Bill Branson, NIH Medical Arts and Photography Branch)
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National Institutes of Health
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National Institute of Allergy and Infectious Diseases

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MISSION

The National Institute of Allergy and Infectious Diseases (NIAID) conducts and supports basic and applied research to better understand, treat, and ultimately prevent infectious, immunologic, and allergic diseases.

Following is a brief description of the major areas of investigation.

- *Acquired Immunodeficiency Syndrome (AIDS).* NIAID conducts and supports research on HIV/AIDS from basic research through clinical evaluation of treatment and prevention modalities, including vaccines and topical microbicides. Since the beginning of the epidemic, NIAID's comprehensive research program has been at the forefront in the fight against HIV/AIDS. NIAID supports a broad array of domestic and international HIV/AIDS research programs and collaborates with more than 40 countries through investigator-initiated research grants and multicenter vaccine, therapeutics, microbicide, and prevention clinical research networks. With a number of research programs and initiatives, NIAID is poised to tackle new global research challenges as well as the changing demographics of the HIV/AIDS epidemic.
- *Asthma and Allergic Diseases.* NIAID supports programs to examine the causes, pathogenesis, diagnosis, treatment, and prevention of asthma and allergic diseases. Examples of such programs include the Inner-City Asthma Consortium, the Consortium of Food Allergy Research, and the Asthma and Allergic Diseases Cooperative Research Centers. NIAID operates a pediatric allergy clinic at the NIH Clinical Center that serves as a focal point for translational research conducted in collaboration with NIAID intramural laboratories and clinical trials of novel therapies. In addition, NIAID is the lead agency within HHS for research on food allergies.
- *Biodefense*. To meet the challenges posed by biodefense, NIAID conducts and supports research on basic microbiology of and host response to pathogens as well as development of medical countermeasures for potential agents of bioterrorism and naturally emerging infectious diseases. These countermeasures include (1) rapid, accurate diagnostics for natural and bioengineered microbes; (2) effective antimicrobials, antitoxins, and immunotherapeutics to treat those individuals affected; and (3) prophylactic and post-exposure vaccines. NIAID also supports biodefense and emerging infectious disease research through training programs and enhancement of research infrastructure and capacity, and by providing needed research resources and reagents to the scientific community. Basic research provides the essential underpinnings for the other research areas. The program embraces the concept that bioterrorism and emerging infectious diseases are related public health issues.
- *Emerging and Re-emerging Infectious Diseases.* New diseases are arising worldwide, and old diseases are re-emerging as infectious agents evolve or spread and as changes occur in ecology, socioeconomic conditions, and population patterns. NIAID conducts and supports basic research on influenza, severe acute respiratory syndrome (SARS), West Nile virus, malaria, hepatitis C, tuberculosis, and other emerging and re-emerging diseases, as well as translational research to develop new and improved diagnostics, treatments, and vaccines.
- *Enteric Diseases.* The global burden of enteric disease is second only to respiratory infection as a cause of sickness and death. Enteric diseases range from persistent, low-grade infections to severe, acute epidemic cholera. An additional burden of disease occurs because enteric infection greatly exacerbates the pathogenicity of diseases such as malaria and HIV/AIDS. Multi-drug resistance is a major problem, making *Salmonella, Clostridium difficile,* and cholera particularly difficult to treat in the settings where it is most likely to develop a fatal outcome. One of the most severe enteric infections is cholera, the most rapidly killing bacterial disease. Cholera is endemic in over 50 countries, and has recently been responsible for explosive epidemics in Africa and Asia. NIAID has been involved in many of the most important advances against cholera and other enteric diseases, including supporting the development of oral rehydration therapy, considered to be one of the most important medical advances of the 20th century. Presently, NIAID supports a robust research program of basic and applied research investigating how enteric pathogens cause illness, and developing appropriate diagnostics, vaccines, and therapeutics to prevent infection and to treat patients.
- *Fundamental Immunology.* NIAID oversees investigator-initiated grants and solicited research programs whose goals are to support a strong program in basic immunobiology and biodefense. Because immue-mediated diseases cross many clinical specialties, a more profound understanding of the normal human immune system and its role in disease are needed to improve the clinical management of people with these disorders. NIAID-supported research has yielded a wealth of new information leading to extraordinary growth in the conceptual understanding of the immune system.
- *Genetics and Transplantation.* NIAID's basic immunology and genetics research seeks to define the effects of gene expression on immune function and to determine the manner in which the products of gene expression control the immune response to foreign substances, such as transplanted organs and cells. NIAID supports studies to further develop methods and reagents needed for precise tissue typing to ensure that transplant recipients receive the best-matched donor organs available. Research programs in genetics and transplantation include HLA Region Genetics in Immune-Mediated Diseases, the Genomics of Transplantation, and Clinical Trials in Organ Transplantation.
- *Immune-Mediated Diseases.* NIAID conducts and supports basic, preclinical, and clinical research on immune-mediated diseases, autoimmune disorders, primary immunodeficiency diseases, and the rejection of transplanted organs, tissues, and cells. Efforts are underway to evaluate the safety and efficacy of

tolerance induction strategies for treating immune-mediated diseases, as well as clinical trials to assess the efficacy of hematopoietic stem cell transplantation for treating severe autoimmune disorders. Programs include the Autoimmunity Centers of Excellence, the Immune Tolerance Network (http://immunetolerance.org), Autoimmune Diseases Prevention Centers, Clinical Trials in Organ Transplantation, the Primary Immunodeficiency Diseases Consortium (http://www.usidnet.org/), and the Clinical Islet Transplantation Consortium. NIAID chairs the NIH Autoimmune Diseases Coordinating Committee (ADCC). *Malaria and Other Tropical Diseases.* Each year, millions of people worldwide are disabled or killed by tropical diseases such as malaria, filariasis, schistosomiasis, leishmaniasis, trypanosomiasis (e.g., Chagas disease and African sleeping sickness), leprosy, and dengue. NIAID supports basic research on the microbes and parasites that cause tropical diseases, as well as the interactions of these organisms with their human hosts and with animal/invertebrate vectors involved in disease transmission. NIAID also supports translational and clinical research to develop new and improved diagnostics, drugs, vaccines, and vector management strategies for tropical diseases. These efforts are conducted by U.S. and foreign investigators receiving Institute support and by NIAID intramural scientists and their collaborators around the world. In addition, the International Centers for Excellence in Research (ICER) program promotes and sustains research programs in developing countries through partnerships with local scientists. The current ICER sites are located in Mali, India, and Uganda. While the ICER program is focused on clinical research in infectious diseases such as malaria and filariasis, each center has the capability to address the research and training needs of greatest relevance to the local population. Clinical research on tropical diseases is largely dependent upon access to populations of patients, vectors, and pathogens/parasites in countries where these diseases are endemic; thus, an important complementary objective of NIAID's program is to strengthen international research capacity through research resources and support, scientific collaborations, and research training.

- *Influenza.* NIAID has supported a focused research program on influenza infections for many years. In response to the emergence and spread of highly pathogenic avian influenza H5N1 and the persistent threat of pandemic influenza, NIAID greatly expanded its influenza program. A broad range of research activities are supported through individual grants and contracts, collaborations with industry partners and investigators in several research networks, including the Vaccine and Treatment Evaluation Units (VTEUs) for the clinical evaluation of candidate products, including several 2009 H1N1 influenza vaccines. NIAID also supports the Centers of Excellence in Influenza Research and Surveillance network. This program conducts animal influenza surveillance domestically and internationally and focuses on basic research to enhance our understanding of influenza pathogenesis, transmission, evolution, and host response. NIAID also supports activities to develop the next generation of diagnostics, vaccines, and therapeutics and antivirals. NIAID resources and services are available to support early stage development of new vaccine and therapeutic candidates to help advance them through the product development pipeline. Ongoing projects include research to develop a "common epitope" influenza vaccine and therapeutics that protect against all medically important influenza strains; systems biology approaches to identify host factors required for influenza infection to expand the number of potential targets for new drug development; and clinical research.
- *Pathogen Genomics*. NIH is working to sequence the entire genomes of microbial pathogens and invertebrate vectors of infectious diseases. Efforts to sequence pathogen genomes are enabling scientists to identify genes that may lead to potential new vaccine candidates and drug targets so that infectious diseases can be prevented or be accurately diagnosed and treated. Furthermore, knowing a pathogen's genetic sequence will help researchers better understand how mechanisms of pathogenesis and pathogen mutations contribute to drug resistance. In addition to supporting sequencing projects, NIAID provides genomics, bioinformatics, and proteomics resources and tools to the scientific community.
- *Sexually Transmitted Infections (STIs).* More than 15 million Americans each year acquire infectious diseases other than AIDS through sexual contact. STIs such as gonorrhea, syphilis, chlamydia, genital herpes, and human papillomavirus can have devastating consequences, particularly for young adults, pregnant women, and newborn babies. NIAID-supported scientists in STI Cooperative Research Centers, NIAID laboratories, and other research institutions are developing better diagnostic tests, improved treatments, and effective vaccines for STIs.
- *Vaccine Development.* Effective vaccines have contributed enormously to improvements in public health in the United States during the last century. Research conducted and supported by NIAID has led to new or improved vaccines for a variety of serious diseases, including rabies, meningitis, whooping cough, hepatitis A and B, chickenpox, and pneumococcal pneumonia, to name a few. NIAID supports vaccine evaluation units for the clinical testing of new vaccines and vaccine technologies at a number of U.S. medical centers. Many vaccines are currently under development in NIAID labs, including vaccines to prevent AIDS, pandemic influenza, childhood respiratory diseases, dengue, and malaria.
- *Drug Research and Development.* The development of therapies to treat infectious and immunologic diseases is a key component of NIAID's mission. In collaboration with industry, academia, non-profits, and other government agencies, NIAID has established research programs to facilitate drug development, including screening programs to identify compounds with potential for use as therapeutic agents, facilities to conduct preclinical testing of promising drugs, and clinical trials networks to evaluate the safety and efficacy of drugs and therapeutic strategies in humans.
- *Antimicrobial Resistance.* NIAID funds a diverse portfolio of grants and contracts to study antimicrobial resistance in major viral, bacterial, fungal, and parasitic pathogens. Projects include basic research on the disease-causing mechanisms of pathogens, host-pathogen interactions, and the molecular mechanisms responsible for drug resistance, as well as translational research to develop and evaluate new or improved products for disease diagnosis, intervention, and prevention. NIAID supports clinical trials that assess new and existing antimicrobials and new vaccines relevant to drug-resistant infections through NIAID-targeted initiatives and clinical trial networks, which include the Collaborative Antiviral Study Group, the Adult AIDS Clinical Trials Groups, and the Vaccine and Treatment Evaluation Units.
- *Minority and Women's Health.* Some of the diseases studied by NIAID disproportionately affect women and minority populations. The Institute remains committed to the inclusion of minorities and women in every aspect of its scientific agenda, from recruitment of special populations into clinical studies to the conduct of biomedical research by minority researchers. NIAID's Office of Special Populations and Research Training sponsors activities aimed at eliminating the continuing health disparities among these populations. Through the Office's efforts, activities are developed to encourage scientific advances in sex and gender differences research. The Office also develops innovative training initiatives to increase the number of minority scientists by supporting undergraduate, graduate, and postgraduate research training in immunologic and infectious diseases. NIAID research results are disseminated to underserved minority communities through the Institute's outreach activities, which have focused on HIV/AIDS, asthma, sexually transmitted infections, and autoimmune diseases.

IMPORTANT EVENTS IN NIAID HISTORY

1948—The National Microbiological Institute was established November 1. The Rocky Mountain Laboratory and the Biologics Control Laboratory, both dating to 1902, were incorporated into the new institute, together with the Division of Infectious Diseases and the Division of Tropical Diseases of NIH.

1951—An institute-supported grants program was initiated, and a branch was established to administer research, training, and fellowship grants. Grant applications were reviewed by the National Advisory Health Council until 1956.

1953—The Clinical Research Branch was renamed the Laboratory of Clinical Investigation.

1955—The National Microbiological Institute became the National Institute of Allergy and Infectious Diseases on December 29. The Biologics Control Laboratory was detached from the institute and expanded to division status within NIH.

1956—The first meeting of the National Advisory Allergy and Infectious Diseases Council was held March 7-8.

1957—The Laboratory of Immunology was established in January to meet the growing need for research on the mechanisms of allergy and immunology.

The Middle America Research Unit was established in the Canal Zone jointly by NIAID and the Walter Reed Army Institute of Research as a temporary field station, made permanent in 1961. Important tropical diseases studies were done there for 15 years. NIAID transferred its part of the program to the Gorgas Memorial Institute in 1972.

1959—The Laboratory of Parasitic Diseases was established, formerly a part of the Division of Tropical Diseases.

1962—A collaborative research program funded mainly by contracts was established within the institute to plan, coordinate, and direct nationwide projects on infectious diseases, vaccine development, transplantation immunology, research reagents, and antiviral substances.

1967—The Laboratory of Viral Diseases was established.

1968—With the dissolution of NIH's Office of International Research (OIR) and creation of the Fogarty International Center on July 1, 1968, programs formerly managed by OIR were transferred to NIAID to be administered by the Geographic Medicine Branch. These included the U.S.-Japan Cooperative Medical Science Program—initiated in 1965 by the President and the Japanese Prime Minister to explore the health problems of Asia—and the International Centers for Medical Research and Training, a 1960 congressional initiative to advance the status of U.S. health sciences through international research.

1971—The first 7 Allergic Disease Centers were established to translate basic concepts of the biomedical sciences into clinical investigations.

1974—The first centers for the study of sexually transmitted diseases and of influenza were established.

1977—The NIAID Extramural Research Program was reorganized into 3 areas: Microbiology and Infectious Diseases; Immunology, Allergic and Immunologic Diseases; and Extramural Activities. An intramural Laboratory of Immunogenetics was formed.

1978—The first maximum containment facility (P4) for recombinant DNA research was opened in Frederick, Md. International program project grants and international exploratory/development research grants programs were established. Centers were created for interdisciplinary research on immunologic diseases.

1979—The Office of Recombinant DNA Activities was transferred from the National Institute of General Medical Sciences to NIAID. The International Collaboration in Infectious Diseases Research Program superseded the International Centers for Medical Research and Training established in 1960.

The Rocky Mountain Laboratory was reorganized into the Laboratory of Persistent Viral Diseases, to deal with both host and viral mechanisms leading to slow or persistent viral infections; the Laboratory of Microbial Structure and Function, directed at bacterial diseases, particularly sexually transmitted diseases; and an Epidemiology Branch.

1980—The Laboratory of Immunoregulation was established to provide a means for applying new knowledge in immunology to the clinical diagnosis and treatment of patients with immunological disorders.

1981—The Laboratory of Molecular Microbiology was created to exploit new techniques in recombinant DNA methodology and other molecular studies to expand the institute's interests in both bacterial and viral pathogenesis and virulence.

1984—The Office of Tropical Medicine and International Research (OTMIR) was established to coordinate NIAID's intramural and extramural research activities in tropical medicine and other international research. OTMIR works with other Federal agencies and international organizations active in these areas.

1985—The Laboratory of Immunopathology was established. At Rocky Mountain Laboratories, the Epidemiology Branch was renamed the Laboratory of Pathology.

1986—An Acquired Immunodeficiency Syndrome (AIDS) Program was established in January to coordinate the institute's extramural research efforts in HIV/AIDS.

1987—The Laboratory of Cellular and Molecular Immunology was established.

1988—The Immunology, Allergic and Immunologic Diseases Program was reorganized and renamed the Allergy, Immunology, and Transplantation Program.

The Office of Recombinant DNA Activities transferred from NIAID to the NIH Office of the Director.

1989—NIAID's programs became divisions: Intramural Research; Microbiology and Infectious Diseases; Allergy, Immunology, and Transplantation; Acquired Immunodeficiency Syndrome; and Extramural Activities.

1990—At Rocky Mountain Laboratories, a section of the Laboratory of Microbial Structure and Function became the Laboratory of Intracellular Parasites. The name of the Laboratory of Pathobiology was changed to the Laboratory of Vectors and Pathogens.

1991—The Laboratory of Host Defenses was established.

1994—The Laboratory of Allergic Diseases was established.

The Office of Research on Minority and Women's Health was created.

At Rocky Mountain Laboratories, the Laboratory of Vectors and Pathogens was renamed the Microscopy Branch.

1999—The Dale and Betty Bumpers Vaccine Research Center was launched—a research program jointly funded by NIAID, NCI, and the NIH Office of AIDS Research.

2000—The Children's Health Act of 2000 (P.L. 106-310) codified the NIH Autoimmune Diseases Coordinating Committee in law. ADCC is chaired by NIAID.

2001—Malaria Vaccine Development Unit was dedicated.

2002—Laboratory of Parasitic Diseases was reorganized; Laboratory of Malaria and Vector Research was established.

The Office of Biodefense Research Affairs was established within the Division of Microbiology and Infectious Diseases (DMID) to coordinate the planning, implementation, and evaluation of DMID-wide biodefense research.

NIAID awarded its first Partnership grants to support collaboration between private industry, academia, and government to accomplish critical infectious disease and biodefense research goals.

2003—NIAID established an intellectual and physical infrastructure for biodefense research through awards to support National and Regional Biocontainment Laboratories (NBLs and RBLs) and Regional Centers of Excellence (RCEs) for Biodefense and Emerging Infectious Diseases.

2004—The Laboratory of Molecular Immunology was established.

2005—The Laboratory of Zoonotic Pathogens was established.

The Laboratory of Bacterial Diseases was established.

NIAID made its first awards using authorities granted under Project Bioshield legislation to support development of new therapeutics and vaccines against some of the most deadly agents of bioterrorism including anthrax, botulinum toxin, Ebola virus, pneumonic plague, smallpox, and tularemia.

2006—The Division of Clinical Research was established.

The Laboratory of Virology was established.

The C.W. Bill Young Center for Biodefense and Emerging Infectious Diseases (Building 33) was launched to carry out NIAID's mission in emerging infectious disease research, including the development of medical countermeasures for biodefense.

NIAID LEGISLATIVE CHRONOLOGY

November 1, 1948—The National Microbiological Institute was established under authority of section 202 of the Public Health Service (PHS) Act, as implemented by General Circular No. 55, Organization Order No. 20, dated October 8, 1948.

December 29, 1955—NIAID was established (replacing the National Microbiological Institute) under authority of the Omnibus Medical Research Act (P.L. 81-692, 64 Stat. L. 443) as implemented by PHS Briefing Memorandum of November 4, 1955, from the Surgeon General to the Secretary of Health, Education, and Welfare.

November 4, 1988—NIAID was provided with additional authorities under title II of the Health Omnibus Programs Extension Act of 1988 (P.L. 100-607), the first major law to address AIDS research, information, education, and prevention.

August 14, 1991—The PHS act (P.L. 102-96), the "Terry Beirn Community Based AIDS Research Initiative Act of 1991" reauthorized NIAID's Community Programs for Clinical Research on AIDS (CPCRA) for another 5 years.

June 10, 1993—The PHS act was amended by P.L. 103-43, the National Institutes of Health Revitalization Act of 1993. This comprehensive legislation required NIAID to include research on tropical diseases in its mission statement and directed the U.S. Secretary of Health and Human Services (HHS) to ensure that individuals with expertise in chronic fatigue syndrome or neuromuscular diseases are appointed to appropriate NIH advisory committees.

December 14, 1993—The Preventive Health Amendments of 1993 were passed, which included provisions requiring the Director of NIAID to conduct or support research and research training regarding the cause, early detection, prevention, and treatment of tuberculosis. (The institute already had authority to conduct such research under its authorities in Title IV, PHS act.)

October 7, 1998—Rep. Anne Northup (Ky.), on behalf of herself and Rep. Bill Young (Fla.), introduced H.C.R. 335, a resolution recognizing NIAID's 50th anniversary. On October 9, Sen. Richard Durbin (Ill.), on behalf of himself and Sen. Connie Mack (Fla.), introduced a companion measure, S.C.R. 127. Both pieces of legislation were submitted to "demonstrate the support of the U.S. Congress for the NIAID, the NIH and all of the dedicated professionals who have devoted their lives to improving the quality of the Nation's health."

October 17, 2000—The Children's Health Act (P.L. 106-310) required the Directors of NIAID and the National Institute of Arthritis and Musculoskeletal and Skin Diseases to expand and intensify the activities of their Institutes with respect to research and related activities concerning juvenile arthritis and related conditions.

November 13, 2000—The Public Health Improvement Act (P.L. 106-505) authorized the NIAID Director to establish a program of clinical research and training

awards for sexually transmitted diseases.

July 21, 2004—The Project BioShield Act (P.L. 108-276) authorized the NIAID Director to provide grants for the modernization and construction of biomedical and behavioral research facilities and increased the Federal share of such NIAID-funded projects. The law also authorized the HHS Secretary to employ other procedures to respond to pressing needs in the research and development of countermeasures against biological, chemical, radiological, and nuclear threats, including expediting peer review procedures in certain instances, contracting with experts or consultants, and appointing professional and technical employees to positions at NIH.

July 30, 2008—The Tom Lantos and Henry J. Hyde United States Global Leadership Against HIV/AIDS, Tuberculosis, and Malaria Reauthorization Act of 2008 (P.L. 110-293) authorized the NIAID Director, acting through the head of the Division of AIDS and in accordance with the NIH peer-review process, to carry out research on, and development of, safe and effective methods for use by women to prevent the transmission of HIV, which may include microbicides.

BIOGRAPHICAL SKETCH OF NIAID DIRECTOR ANTHONY S. FAUCI, M.D.

Anthony S. Fauci, M.D., became the Director of NIAID in 1984. He received his undergraduate degree from Holy Cross College in 1962 and his medical degree from Cornell University Medical College in 1966. He completed his internship and residency at The New York Hospital Cornell Medical Center and joined NIAID in 1968 as a clinical associate in the Laboratory of Clinical Investigation. In 1980, Dr. Fauci became Chief of the Laboratory of Immunoregulation, a post he continues to hold. Dr. Fauci serves as one of the key advisors to the White House and Department of Health and Human Services on global AIDS issues, and on initiatives to bolster medical and public health preparedness against emerging infectious disease threats such as pandemic influenza.

Dr. Fauci has made many contributions to basic and clinical research on the pathogenesis and treatment of immune-mediated and infectious diseases, including human immunodeficiency virus (HIV) disease. In 2003, an Institute for Scientific Information study indicated that in the 20-year period from 1983 to 2002, Dr. Fauci was the 13th most-cited scientist among the 2.5 to 3 million authors in all disciplines throughout the world who published articles in scientific journals during that time frame. Dr. Fauci was the world's 10th most-cited HIV/AIDS researcher in the period 1996 to 2006.

Dr. Fauci has received 35 honorary doctorate degrees from universities in the United States and abroad, as well as the Presidential Medal of Freedom, the National Medal of Science, the Mary Woodard Lasker Award for Public Service, and other major awards. A member of the National Academy of Sciences and many other professional organizations, Dr. Fauci is the author, coauthor, or editor of more than 1,100 scientific publications, including several textbooks.

DIRECTORS OF NIAID

Name	In Office from	To
Victor H. Haas	November 1, 1948	April 1957
Justin M. Andrews	April 1957	October 1, 1964
Dorland J. Davis	October 1, 1964	August 1975
Richard M. Krause	August 1975	July 1984
Anthony S. Fauci	November 1984	Present

RESEARCH PROGRAMS

NIAID is composed of 7 research divisions: the Division of Acquired Immunodeficiency Syndrome; the Division of Allergy, Immunology, and Transplantation; the Division of Clinical Research; the Division of Extramural Activities; the Division of Intramural Research; the Division of Microbiology and Infectious Diseases; and the Dale and Betty Bumpers Vaccine Research Center. NIAID scientists conduct intramural research in laboratories located in Bethesda, Rockville, and Frederick, Maryland, and in Hamilton, Montana. More information on NIAID programs, committees, and initiatives can be found on NIAID's web site at www.niaid.nih.gov.

Division of Acquired Immunodeficiency Syndrome

The Division of Acquired Immunodeficiency Syndrome (DAIDS) was formed in 1986 to develop and implement the national research agenda to address the HIV/AIDS epidemic. Today, with the ever-changing demographics of the epidemic, DAIDS is expanding its focus to a more global research agenda with an emphasis on an integrated prevention and therapeutics agenda. The mission of DAIDS is to help ensure an end to the HIV/AIDS epidemic. DAIDS accomplishes its mission through planning, implementing, managing, and evaluating programs in (1) fundamental basic research; (2) discovery, development, and optimization of therapies and treatment strategies for HIV infection and its complications and co-infections; and (3) discovery and development of preventive vaccines, topical microbicides, and other biomedical prevention strategies. *Carl W. Diffenbach, Ph.D. Director*.

Division of Allergy, Immunology, and Transplantation

The Division of Allergy, Immunology, and Transplantation (DAIT) promotes and supports a broad range of research that seeks to further our understanding of the immune mechanisms underlying immune-mediated diseases and translating this basic knowledge to clinical applications that will benefit individuals affected by these diseases. DAIT supports preclinical and clinical development of new tolerogenic and immunomodulatory approaches for the treatment and prevention of many immune-mediated diseases, and is the lead NIH component for research on transplantation. The ultimate goal of DAIT's research program is the development of effective approaches for the treatment and prevention of immune-mediated diseases. *Daniel Rotrosen, M.D., Director*.

Division of Clinical Research

The Division of Clinical Research (DCR) plays an integral role in facilitating the efficient and effective performance of NIAID research programs on both the domestic and the international level. This is accomplished through a multi-faceted approach to the provision and support of services vital to the research infrastructure that include oversight and management of intramural clinical research, program planning and management, regulatory monitoring and compliance, statistical consultation and research methodology, and clinical research capacity building. *H. Clifford Lane, M.D., Director.*

Division of Extramural Activities

The Division of Extramural Activities (DEA) serves NIAID's extramural research community and the Institute in several key areas: overseeing policy and management for grants and contracts; managing NIAID's research training, small business, and international programs; and conducting initial peer review for funding mechanisms with Institute-specific needs. In addition to providing broad policy guidance to Institute management, DEA also oversees all of NIAID's chartered committees, including the National Advisory Allergy and Infectious Diseases Council; disseminates information to its extramural community through its large Internet site; and develops extramural staff training and communications through the NIAID intranet. *Marvin Kalt, Ph.D.*, *Director.*

Division of Intramural Research

The Division of Intramural Research (DIR) is composed of 20 laboratories and 4 branches that conduct biomedical research programs covering a wide range of disciplines relating to immunology, allergy, and infectious diseases. This includes the subdisciplines of virology, microbiology, biochemistry, parasitology, epidemiology, mycology, molecular biology, immunology, immunopathology, and immunogenetics. In addition, DIR supports a large clinical effort to conduct patient-centered research in allergy, immunology, and infectious diseases. *Kathryn C. Zoon, Ph.D., Director*.

Division of Microbiology and Infectious Diseases

The Division of Microbiology and Infectious Diseases (DMID) supports extramural research to control and prevent diseases caused by virtually all human infectious agents, including bacterial, viral, parasitic, and prion diseases, but not HIV. DMID supports a wide variety of projects spanning the spectrum from basic biology of human pathogens and their interaction with human hosts, through translational and clinical research toward the development of new and improved diagnostics, drugs, and vaccines for infectious diseases. DMID's Biodefense Research Program supports basic research on organisms on the NIAID Category A to C list of priority pathogens for biodefense and emerging infectious diseases, as well as translational and clinical research to develop medical countermeasures for diseases caused by these agents. *Carole A. Heilman, Ph.D., Director*.

Dale and Betty Bumpers Vaccine Research Center

The Vaccine Research Center (VRC) conducts research that facilitates the development of effective vaccines for human disease. The primary focus of activities at the VRC is the development of an effective HIV/AIDS vaccine. In addition to its work on HIV, the VRC has expanded the scope of its activities to include research on developing improved smallpox vaccines; effective vaccines for Ebola and other viral hemorrhagic fevers; vaccines for West Nile virus and for SARS (severe acute respiratory syndrome)-associated coronavirus; and improved influenza vaccines protective against both seasonal influenza and avian influenza strains with the potential for pandemic outbreaks. Goals of the VRC include (1) determining whether a T-cell based vaccine can protect against acquisition of HIV-1 infection or delay disease progression; (2) developing an HIV-1 vaccine candidate that elicits neutralizing antibodies to circulating viral isolates and advancing such a vaccine into clinical trials; (3) identifying improved T-cell vaccines that optimize HIV-1-specific immunity and are independent of anti-vector immunity; and (4) advancing vaccine candidates into efficacy trials for Ebola, Marburg, and influenza viruses. *Gary Nabel, M.D., Ph.D., Director*.

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U.S. Department of Health & Human Services

National Institutes of Health
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Recent Photos from the National Institute of Allergy and Infectious Diseases (NIAID)

2009 PHOTOS

W. Ian Lipkin, M.D. delivers the 2009 Kinyoun lecture.
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Poster for the 2009 Kinyoun Lecture.
lo-res | hi-res

2007 PHOTOS

NIAID Director Dr. Anthony S. Fauci receives the 2007 Mary Woodard Lasker Award for Public Service. The award recognized Dr. Fauci's role in developing two major U.S. public health programs, in AIDS and biodefense.
lo-res | hi-res

Harvard Medical School's Dr. Paul Farmer focused on community-based care for chronic infectious disease when he delivered the 2007 James C. Hill Memorial Lecture, presented in April 2007 on the NIH campus. The Hill lecture honors the memory of the former NIAID deputy director, who helped build the Institute's HIV/AIDS research program during the early years of the epidemic.
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National Institute of Arthritis and Musculoskeletal and Skin Diseases

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Until May 19, 1972, the National Institute of Arthritis and Metabolic Diseases; until June 23, 1981, the National Institute of Arthritis, Metabolism, and Digestive Diseases; until April 8, 1986, the National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases.

MISSION

The National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) was established in 1986. The mission of the NIAMS is to support research into the causes, treatment, and prevention of arthritis and musculoskeletal and skin diseases; the training of basic and clinical scientists to carry out this research; and the dissemination of information on research progress in these diseases.

The Institute also conducts and supports basic research on the normal structure and function of bones, joints, muscles, and skin. Basic research involves a wide variety of scientific disciplines, including immunology, genetics, molecular biology, structural biology, biochemistry, physiology, virology, and pharmacology. Clinical research includes rheumatology, orthopaedics, dermatology, metabolic bone diseases, heritable disorders of bone and cartilage, inherited and inflammatory muscle diseases, and sports and rehabilitation medicine.

IMPORTANT EVENTS IN NIAMS HISTORY

November 20, 1985—The Health Research Extension Act of 1985 (P.L. 99-158) authorized the establishment of the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS).

April 8, 1986—The NIAMS was established.

February 18, 1987—The first meeting of the National Arthritis and Musculoskeletal and Skin Diseases Advisory Council was held.

April 15, 1996—The NIAMS held a 10th anniversary symposium: "*Progress and Promise in Chronic Disease*."

April 2006—The NIAMS celebrated its 20th anniversary.

June 13, 2011—The NIAMS hosted a scientific symposium: *Improving Lives Through Discovery*, one of many activities held throughout the year that recognized the 25th anniversary of the Institute. For more information, visit http://www.niams.nih.gov/25th_Anniversary/default.asp

NIAMS LEGISLATIVE CHRONOLOGY

August 1950—An arthritis program was established within the National Institute of Arthritis and Metabolic Diseases under Public Law 81-692.

May 1972—P.L. 92-305 renamed the Institute the National Institute of Arthritis, Metabolism, and Digestive Diseases.

1973—Senator Alan Cranston introduced legislation that would eventually lead to the National Arthritis Act. Companion legislation was introduced in the House by Congressman Paul Rogers.

January 1975—The National Arthritis Act (P.L. 93-640) established the National Commission on Arthritis and Related Musculoskeletal Diseases to study the problem of arthritis in depth and to develop an arthritis plan. The act also established the position of associate director for arthritis and related musculoskeletal diseases and authorized an interagency arthritis coordinating committee; community demonstration project grants; an arthritis data bank; an information clearinghouse; and comprehensive centers for research, diagnosis, treatment, rehabilitation, and education.

April 1976—After a year of study and public hearings, the commission issued a comprehensive plan aimed at diminishing the physical, economic, and psychosocial effects of arthritis and musculoskeletal diseases. It laid the groundwork for a national program encompassing research, research training, education, and patient

care.

October 1976—The Arthritis, Diabetes, and Digestive Diseases Amendments of 1976 (P.L. 94-562) established the National Arthritis Advisory Board to review and evaluate the implementation of the Arthritis Plan, prepared in response to the National Arthritis Act (P.L. 93-640).

December 1980—P.L. 96-538 changed the name of the Institute to the National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases. 1982—The U.S. Department of Health and Human Services (HHS) conferred bureau status on the Institute, resulting in creation of the Division of Arthritis, Musculoskeletal, and Skin Diseases and the appointment of a division director.

November 1985—The Health Research Extension Act of 1985, P.L. 99-158, established the National Institute of Arthritis and Musculoskeletal and Skin Diseases to bring increased emphasis to research on these disorders. The legislation provided for the development of a plan for a national arthritis and musculoskeletal diseases program, and establishment of two interagency coordinating committees, one on arthritis and musculoskeletal diseases and one on skin diseases. It also expanded the activities of the National Arthritis Advisory Board to include musculoskeletal and skin diseases.

September 1993—The NIH Revitalization Act of 1993 (P.L. 103-43) called on the NIAMS to establish "an information clearinghouse on osteoporosis and related bone disorders to facilitate and enhance knowledge and understanding on the part of health professionals, patients, and the public through the effective dissemination of information."

October 2000—The Children's Health Act of 2000 (P.L. 106-310) called on the NIAMS to expand and intensify research programs on juvenile arthritis and related conditions, in coordination with other NIH Institutes and the Arthritis and Musculoskeletal Diseases Interagency Coordinating Committee. Further language stipulated that the Institute's current information clearinghouse include resources on juvenile arthritis and associated conditions.

November 2000—The Lupus Research and Care Amendments of 2000, which passed as part of the Public Health Improvement Act (P.L. 106-505), required the NIAMS to expand and intensify research and related activities regarding lupus, and to coordinate such efforts with other NIH Institutes, as appropriate. Among other provisions, the bill called for information and education programs for health professionals and the public.

December 2001—The Muscular Dystrophy Community Assistance, Research, and Education Amendments of 2001, or the MD-CARE Act (P.L. 107-84), called on several components of the NIH, including the NIAMS, to enhance research on muscular dystrophy, including establishing Centers of Excellence.

February 2003—The Office of the Secretary, HHS, was called on to establish a Federal working group on lupus for the purpose of exchanging information and coordinating Federal efforts regarding lupus research and education initiatives (P.L. 108-7, Omnibus Appropriations Act for FY 2003). The NIAMS, as the lead Institute at the NIH for lupus research, was asked to lead this Federal working group. The group is comprised of representatives from all relevant HHS agencies and other Federal departments having an interest in lupus.

October 2008—The Paul D. Wellstone Muscular Dystrophy Community Assistance, Research, and Education (MD-CARE) Amendments of 2008 (P.L. 110-361) officially named the muscular dystrophy Centers of Excellence as the Paul D. Wellstone Muscular Dystrophy Cooperative Research Centers. In addition, the Muscular Dystrophy Coordinating Committee was authorized to give special consideration to enhance the clinical research infrastructure to test emerging therapies for the various forms of muscular dystrophy.

BIOGRAPHICAL SKETCH OF NIAMS DIRECTOR STEPHEN I. KATZ, M.D., PH.D.

Stephen I. Katz, M.D., Ph.D., has been Director of the National Institute of Arthritis and Musculoskeletal and Skin Diseases since August 1995, and is also a Senior Investigator in the Dermatology Branch of the National Cancer Institute. He was born in New York in 1941 and his early years were spent in the Washington, D.C., and Bethesda, Maryland areas. After attending the University of Maryland, where he graduated with honors, he graduated from the Tulane University Medical School with honors in 1966. He completed a medical internship at Los Angeles County Hospital and did his dermatology residency at the University of Miami Medical Center from 1967 to 1970. He served in the U.S. military at Walter Reed Army Medical Center from 1970 to 1972. From 1972 to 1974, Dr. Katz did a postdoctoral fellowship at the Royal College of Surgeons of England and obtained a Ph.D. degree in immunology from the University of London in 1974. He then became Senior Investigator in the Dermatology Branch of the National Cancer Institute and assumed the position of Acting Chief in 1977. In 1980, he became Chief of the Branch, a position he held until 2002. In 1989, Dr. Katz also assumed the position of Marion B. Sulzberger Professor of Dermatology at the Uniformed Services University of the Health Sciences in Bethesda, Maryland, a position he held until 1995.

Dr. Katz has focused his studies on immunology and the skin. His research has demonstrated that skin is an important component of the immune system both in its normal function and as a target in immunologically-mediated disease. In addition to studying Langerhans cells and epidermally-derived cytokines, Dr. Katz and his colleagues have added considerable new knowledge about inherited and acquired blistering skin diseases.

Dr. Katz has trained a large number of outstanding immunodermatologists in the U.S., Japan, Korea, and Europe. He has served many professional societies in leadership positions including the Society for Investigative Dermatology and the Association of Professors of Dermatology, as Secretary-General of the 18th World Congress of Dermatology in New York in 1992, as Secretary-Treasurer of the Clinical Immunology Society, and as President of both the International League of Dermatological Societies and the International Committee of Dermatology. He has also served on the editorial boards of a number of clinical and investigative dermatology and immunology journals. His honors and awards include the Master Dermatologist Award and the Sulzberger Lecture Award of the American Academy of Dermatology, the National Cancer Institute's Outstanding Mentor Award, the Harvey J. Bullock, Jr., EEO Award in recognition of his extraordinary leadership in scientific, programmatic, and administrative arenas, the Excellence in Leadership Award from the International Pemphigus Foundation, the "Change It" Champion Award from Parent Project Muscular Dystrophy, the Paul G. Rogers Leadership Award from the National Osteoporosis Foundation, honorary membership in numerous international dermatological societies, and election into the Institute of Medicine of the National Academy of Sciences (USA). He has also received the Alfred Marchionini Gold Medal, the Lifetime Achievement Award of the American Skin Association, the Rothman Award for distinguished service to investigative cutaneous medicine, and the Kligman/Frost Award, the latter two from the Society for Investigative Dermatology. He received Doctor Honoris Causa degrees from Semmelweis University in Budapest, Hungary, Ludwig Maximilian University in Munich, Germany, and the University of Athens in Greece. Dr. Katz has been honored by the

Japanese government from which he received the Order of the Rising Sun, Gold Rays with Neck Ribbon from the Japanese Emperor. He was the recipient of the 7th Alan Rabson Award for NCI Intramural Cancer Research, has twice received the Meritorious Rank Award and has also received the Distinguished Executive Presidential Rank Award, the highest honor that can be bestowed upon a civil servant.

NIAMS DIRECTORS

Name	In Office from	To
Lawrence E. Shulman, M.D., Ph.D.	April 1986	October 1994
Michael D. Lockshin, M.D. (Acting)	November 1994	July 1995
Stephen I. Katz, M.D., Ph.D.	August 1995	Present

RESEARCH PROGRAMS

The NIAMS supports a multidisciplinary program of basic, clinical, and translational investigations; epidemiologic research; research centers; and research training for scientists within its own facilities as well as grantees at universities and medical schools nationwide. It also supports the dissemination of research results and information through the National Institute of Arthritis and Musculoskeletal and Skin Diseases Information Clearinghouse and through the NIH Osteoporosis and Related Bone Diseases~National Resource Center.

The *NIAMS Extramural Program* supports research via grants and contracts in two Divisions: the Division of Skin and Rheumatic Diseases and the Division of Musculoskeletal Diseases. A wide array of basic, translational, and clinical research and research training in the fields of rheumatology, muscle biology, orthopaedics, bone and mineral metabolism, and dermatology is being pursued through these programs.

The *Intramural Research Program* of the NIAMS conducts innovative basic, translational, and clinical research relevant to the health concerns of the Institute and provides training for investigators interested in careers in these areas. The ultimate goals are: 1) to provide new insights into the normal function of bones, joints, muscles, and skin, and diseases that affect them; and 2) to generate a cadre of well-trained investigators to continue toward a complete understanding of these structures and the disease conditions that affect them adversely.

Extramural Research Program

Known as "extramural" research, most funding for the NIAMS supports investigators involved in a wide spectrum of basic, clinical, epidemiologic, training, and other programs in universities, medical schools, academic health centers, and small business concerns. The NIAMS Extramural Program's three Divisions—the Division of Extramural Research Activities, the Division of Skin and Rheumatic Diseases, and the Division of Musculoskeletal Diseases—are as follows:

Division of Extramural Research Activities

This Division manages the NIAMS grants policies and procedures, including oversight of grants and contracts administration, scientific review, and clinical research functions. It serves as the primary liaison for the NIAMS with the NIH Office of Extramural Research and with other Institutes that share research interests. The Division handles scientific integrity and ethical questions in research and manages the National Arthritis and Musculoskeletal and Skin Diseases Advisory Council, a congressionally mandated second tier of the NIH peer review system.

The Scientific Review Branch (SRB) conducts initial peer review of specific research applications assigned to the NIAMS. These include applications for Centers, program projects, multi-site clinical trials, scientific meetings, and training and career development awards, as well as applications responding to initiatives published by the NIAMS. External peer reviewers selected from the grant community conduct reviews.

The Grants Management Branch (GMB) works with scientists and institutional research administrators to issue, manage, and close out awards. The branch has legal responsibility for the fiscal management of the Institute's extramural grants and contracts.

Division of Skin and Rheumatic Diseases

The mission of this Division is to promote and support basic, translational, and clinical studies of skin, wound healing, skin disorders, as well as adult and pediatric rheumatic diseases. Approaches supported may include, but are not limited to, molecular and cell biology research; animal model construction; genetics and genomics research; identification of risk factors; autoimmunity and inflammation research; biopsychosocial/behavioral research; outcomes and health services research; and research leading to prevention, diagnosis, control and cure of these disorders. Research is managed under two main areas:

Arthritis and Rheumatic Diseases. The overall goals of the programs in this area are to advance high-quality basic, translational, and clinical research in a number of autoimmune and arthritis-related chronic disorders. These include, but are not limited to, the adult diseases of rheumatoid arthritis (RA), systemic lupus erythematosus (SLE, or lupus), scleroderma, and Sjögren's syndrome. Others include pediatric diseases, such as juvenile idiopathic arthritis, periodic fever syndromes, and juvenile lupus. The programs also support studies focused on the natural history of these disorders, as well as basic biology of autoimmunity and inflammation, to better understand the molecular mechanisms underlying these processes, with the goal of finding ways to interrupt them and improve patient outcomes. The NIAMS is committed to pursuing new opportunities in genetics and genomics research, clinical trial design, pain, and biopsychosocial aspects of diseases in this portfolio. It is also committed to identification of risk factors for these disorders, enhancement of disease prediction, and advancement of prevention strategies.

Skin Biology and Diseases. The programs in these areas support a broad portfolio of basic, translational, and clinical research in skin. These efforts include work on

the developmental and molecular biology of skin and skin appendages, such as the hair follicle, the study of skin as an immune organ, and the genetics of skin diseases. Areas of particular emphasis include: investigations of stem cells found in skin; studies related to wound healing and fibrosis; heritable disorders of connective tissue (such as Marfan's syndrome); studies related to itch; metabolic studies of skin, such as the effects of hormones and the role of enzymes in skin barrier formation; and immunologically mediated cutaneous disorders, such as atopic dermatitis, contact dermatitis, and vasculitis. Research is underway to better understand keratinizing disorders such as psoriasis and ichthyosis; disorders of pigmentation such as vitiligo; and bullous diseases such as pemphigus, pemphigoid, and epidermolysis bullosa. Other studies encompass acne and the physiologic activity of the sebaceous glands, as well as disorders of the hair, such as alopecia areata. Tremendous opportunities exist in the field of skin diseases research, from work directed toward a deeper understanding of the basic biology of skin, to new approaches for developing artificial skin, to advances in imaging technologies for diagnosis and tracking of skin disease progression. The NIAMS is committed to pursuing these and other avenues of research to improve health outcomes for patients with skin diseases.

Division of Musculoskeletal Diseases

The musculoskeletal system is comprised of the skeleton, which provides mechanical support and determines shape; the muscles, which power movement; and connective tissues such as tendon and ligament, which hold the other components together. The cartilage surfaces of joints and the intervertebral discs of the spine allow for movement and flexibility.

The Division of Musculoskeletal Diseases supports research aimed at improving the diagnosis, treatment, and prevention of diseases and injuries of the musculoskeletal system and its component tissues. Key public health problems addressed by this research include osteoporosis, osteoarthritis, and muscular dystrophy. Research is conducted at every level, from fundamental biology to clinical intervention. Research is managed under three main areas:

Bone Biology and Diseases. The programs in these areas cover a broad spectrum of research to better understand genetic and cellular mechanisms involved in the buildup and breakdown of bone. Research areas include: regulation of bone remodeling; mechanisms of bone formation, bone resorption, and mineralization; and effects of hormones, growth factors, and cytokines on bone cells. The programs emphasize the application of fundamental knowledge of bone cell biology to the development of drug and gene therapies for bone diseases, especially osteoporosis. This program area supports several large epidemiologic cohorts for the characterization of the natural history of osteoporosis and for the identification of genetic and environmental risk factors that contribute to bone disease. Like other cohort studies supported by the NIAMS, the ultimate goals are to contribute to the development of better diagnostic tools, treatments, and prevention strategies.

Muscle Biology and Diseases. The programs in these areas support a wide range of basic, translational, and clinical research projects in skeletal muscle biology and diseases. They focus on the fundamental biology of muscle development, physiology, and muscle imaging. Particular interests include the basic biology of satellite and muscle stem cells, excitation-contraction coupling, muscle metabolism, and adaptation of muscle to exercise. The programs address a need for translational research to develop discoveries that enhance treatment and improve management of muscle and musculoskeletal diseases and disorders. The overarching objective is to advance the understanding of—and ultimately prevent and treat—muscular dystrophies, inflammatory myopathies, muscle ion channel diseases, and muscle disorders such as disuse atrophy and age-related loss of muscle mass.

Musculoskeletal Biology and Diseases. The programs in these areas focus on understanding the fundamental biology of tissues that constitute the musculoskeletal system, and on translating and applying this knowledge to a variety of diseases and conditions. Research includes the study of the causes and treatment of acute and chronic injuries—including carpal tunnel syndrome, repetitive stress injury, and low back pain—and clinical and epidemiological studies of osteoarthritis. The programs support the development of new technologies such as methods for imaging bone and cartilage to improve the diagnosis and treatment of skeletal disorders, or to facilitate the repair of damage caused by trauma to otherwise healthy musculoskeletal tissue. Therapeutic approaches of interest in the programs include drugs, nutritional interventions, joint replacement (including biomaterials and implant science), bone and cartilage transplantation, and gene therapy. Tissue engineering, regenerative medicine, sports medicine, and musculoskeletal fitness are areas of special emphasis.

Intramural Research Program

The NIAMS Intramural Research Program (IRP) consists of 18 main components: Office of the Scientific Director, Office of the Clinical Director, Autoimmunity Branch, Cartilage Biology and Orthopaedics Branch, Clinical Trials and Outcomes Branch, Community Research and Care Branch, Laboratory of Molecular Immunogenetics, Laboratory of Muscle Stem Cells and Gene Regulation, Laboratory of Oral Connective Tissue Biology, Laboratory of Skin Biology, Laboratory of Stem Cell Biology, Laboratory of Structural Biology Research, Molecular Immunology and Inflammation Branch, Office of Science and Technology, Pediatric Translational Research Branch, Protein Expression Laboratory, Rheumatology Fellowship and Training Branch, and Career Development and Outreach Branch.

The **Office of the Scientific Director** is responsible for the development of broad decisions concerning program planning, budget and policy formulation, and resource allocation of the intramural program. The Scientific Director represents the NIAMS in discussions of NIH-wide intramural policies and programs, and serves as a vital member of the senior staff of the Institute. The Scientific Director serves as the principal advisor to the Director of the NIAMS concerning all ongoing and projected intramural research programs.

The **Office of the Clinical Director** implements innovative clinical research programs that relate to the broad fields of rheumatologic, musculoskeletal, and skin disorders. Through specific programs in clinical research, rheumatology fellowship and advanced training in translational medicine, and health partnerships, the Office of the Clinical Director plays an important role in establishing cutting-edge therapeutic paradigms, in providing medical education in the field of rheumatology, and in reaching out to the community to reduce health care disparities and to improve the understanding of rheumatic and related diseases.

The **Autoimmunity Branch** conducts basic and clinical research on the pathophysiology and treatment of autoimmune diseases. Signal transduction pathways that differentiate normal and pathological immune responses are studied in mouse models and human tissue samples to gain insights into how these processes drive autoimmune diseases, and how therapies that minimize generalized immune suppression can best be developed for these diseases. The TNF-family of cytokines and their receptors is a current focus of interest in the branch, from basic investigation of the trafficking and signaling by these molecules to the study of human diseases involving TNF-family cytokines and their receptors.

The **Cartilage Biology and Orthopaedics Branch** conducts basic and clinical research on the pathogenesis and treatment of musculoskeletal diseases relevant to the

field of orthopaedic surgery. Current investigations are focused on the genetic, cellular, and molecular events involved in the development of heterotopic ossification (HO). Specific attention is paid to progenitor cells obtained from human tissue samples and their trophic and differentiation properties involved in tissue repair and regeneration.

The **Clinical Trials and Outcomes Branch** conducts research on the health outcomes of patients with rheumatic diseases and orthopaedic conditions. Studies focus on the development and testing of measures of health and disease, identification of predictors of good and poor health outcomes, examination of treatment effectiveness, and investigations of socioeconomic and ethnic disparities in health outcomes.

The **Community Research and Care Branch** coordinates the NIAMS Community Health Center, a health information resource and medical center that carries out research and provides health care services to people affected by arthritis, lupus, and other rheumatic diseases. The center offers patient care with access to specialists, education programs, and referral to clinical investigations for the prevention and treatment of rheumatic diseases. It is located in Silver Spring, MD.

The **Laboratory of Molecular Immunogenetics (LMI)** conducts research on genetic and molecular regulation of normal and abnormal immune cell processes. The LMI, which includes the Molecular Immunology Section and the Genomics and Immunity Section, seeks to understand the molecular underpinnings of how inflammation is regulated in both health and disease. This knowledge can be applied to the development of targeted therapeutic agents that can ameliorate immune system disorders with minimal side effects.

The **Laboratory of Muscle Stem Cells and Gene Regulation** investigates the cellular and molecular mechanisms that regulate differentiation and regeneration of skeletal muscle in physiological and pathological conditions. The ultimate goal of these studies is to provide a conceptual, as well as practical, framework for the diagnosis and treatment of human diseases affecting skeletal muscle.

The **Laboratory of Oral Connective Tissue Biology** studies the molecular biology of dental-oral-craniofacial development, with a focus on the teeth, gums, and related jaw structure. The aim of these studies is to understand cells and signals influencing tooth, bone, and periodontal ligament development in order to identify improved regenerative strategies.

The **Laboratory of Skin Biology** conducts research on the regulation of epidermal differentiation, skin barrier formation, and inflammatory responses associated with barrier dysfunction. A major focus is basic investigation of ectodermal appendage development and the study of human ectodermal dysplasias.

The **Laboratory of Stem Cell Biology** studies cell fate and tissue development. It is using various types of stem cells to generate neurological disease models, to discover and test drugs, and to develop replacement therapies for neurodegenerative diseases and disorders.

The **Laboratory of Structural Biology Research** conducts research into the structural basis of the assembly and functioning of macromolecules and their complexes (such as viruses and cytoskeletal proteins), and the mechanisms and proteins that control their assembly. These studies make extensive use of cryoelectron microscopy and three-dimensional image processing in studies of virus infection and replication; renewal of the epidermis, with maintenance of barrier function; prionogenesis (structural transitions of infectious proteins called prions); and intracellular protein quality control by energy-dependent proteases.

The **Molecular Immunology and Inflammation Branch** conducts basic and clinical investigations of the molecular mechanisms underlying immune and inflammatory responses in rheumatic and autoimmune diseases. A major focus is the study of receptor-mediated signal transduction and how these processes link to the regulation of genes involved in inflammatory responses.

The **Office of Science and Technology** encompasses an infrastructure of research and support facilities designed to enhance the research capabilities of all IRP scientists. In addition, staff members advise the Scientific Director, Laboratory and Branch Chiefs, and other key officials on collaborative and cooperative activities, training programs, and proper use of laboratory animals. Staff members also negotiate and facilitate scientific collaborations that involve trans-institute and trans-NIH initiatives and agreements. The Office includes the following:

- The *Flow Cytometry* Section provides state-of-the-art multiparameter analytic and sorting capabilities for IRP investigators.
- The *Laboratory Animal Care and Use* Section supports all IRP branches and laboratories studying animals.
- The *Light Imaging Section* offers IRP scientists access to state-of-the-art light imaging equipment and expertise in light imaging techniques.
- The *Biodata Mining and Discovery* Section assists with computational and bioinformatics approaches to NIAMS intramural research.
- The *Translational Immunology Section* provides NIAMS investigators with services, consultative advice, and in-depth instructions in a variety of immunologic methods to interpret immunoassays.

The **Pediatric Translational Research Branch**, which includes the *Translational Autoinflammatory Disease* Section, conducts basic, translational, and clinical research to dissect the pathways involved in the pathogenesis of immune-mediated inflammatory diseases. The mechanisms by which specific gene mutations and polymorphisms predispose to inflammation, and how they contribute to unique phenotypic manifestations of individual diseases, are being investigated using a variety of approaches.

The **Protein Expression Laboratory** plans and conducts research on the expression, purification, and structural characterization of human immunodeficiency virus (HIV) and HIV-related proteins. Laboratory scientists also collaborate with NIH intramural researchers studying the structure and function of HIV and HIV-related proteins. The lab serves as a support and resource group for the expression and purification of these proteins.

Rheumatology Fellowship and Training Branch. The Branch is dedicated to the clinical and research training of physicians wishing to pursue careers in biomedical or translational research related to rheumatic diseases. The fellowship program is two years in duration, with extensions available for individuals interested in advanced research training as NIAMS scholars in translational medicine. The program is accredited by the Accreditation Council for Graduate Medical Education (ACGME), and graduates are eligible to sit for the certifying examination in the subspecialty of rheumatology.

The **Career Development and Outreach Branch** advises the Scientific Director, Lab and Branch Chiefs, and other key officials within the NIAMS IRP on current and potential training programs; coordinates resources available for NIAMS fellows and their sponsors; and works in partnership with existing NIAMS and NIH components to ensure that the NIAMS continues to attract the highest caliber of trainees at the postdoctoral, postbaccalaureate, and graduate student levels. The Branch enables NIAMS fellows to become leaders in the biomedical research community and provides trainees with a genuine growth experience, enhancing their ability to compete for independent research or other science-related careers in government or the private sector. In addition, the Branch leads Institute career outreach activities, administers the summer internship program, and supports the annual Intramural Retreat.

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National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Recent Photos from the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)

2012 PHOTOS

NIAMS Intramural researcher Martin Pelletier, Ph.D., discusses his research poster, "Characterization of the inflammatory processes involved in the familial autoinflammatory disease TRAPS," at the NIAMS Intramural Retreat, June 1, 2012.
lo-res

Stephen I. Katz, M.D., Ph.D. (third from left), Director of the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) presented the Lupus Foundation of America's (LFA) National Policy Leadership Award to the U.S. House of Representatives Congressional Lupus Caucus Co-Chairs: From left, Representatives Tom Rooney (R-FL-16), Jim Moran (D-VA-8), Ileana Ros-Lehtinen (R-FL-18), and William Keating (D-MA-10). The award was given for their leadership to ensure that Members of Congress understand the impact of lupus on individuals and their families and actively support the advancement of lupus research and increased awareness of lupus among the public and health professionals. The presentation was made at the LFA's Butterfly Gala on May 8, 2012. Also pictured is Shannon Boxx, U.S. Women's Soccer player and Olympic gold medalist, who is living with lupus. Photo credit: Kaye Evans-Lutterodt
lo-res | hi-res

In 2012, the U.S. Food and Drug Administration approved tofacitinib to treat rheumatoid arthritis. Tofacitinib targets Janus kinases, which were discovered in 1993 by NIAMS Scientific Director John O'Shea, M.D.
lo-res | hi-res

Maria Morasso, Ph.D., Chief of the NIAMS Laboratory of Skin Biology, discusses NIAMS research with representatives from the National Psoriasis Foundation during a visit to NIAMS labs on March 9, 2012.

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2011 PHOTOS

Hundreds of researchers, health care providers and patients from across the U.S. came to the NIH for the NIAMS 25th Anniversary Scientific Symposium held in Lipsett Amphitheater on June 13, 2011.
lo-res | hi-res

NIH Director Dr. Francis Collins and Research!America Chairman John Edward Porter joined NIAMS Director Dr. Stephen Katz in delivering introductory talks. Dr. Collins praised the NIAMS for tackling the nation's "common, chronic, crippling and costly" diseases by anticipating where scientific opportunities lay, exploiting them and shepherding research toward meaningful results.
lo-res | hi-res

NIAMS Director Dr. Stephen Katz discusses the Institute's many partners at the NIAMS 25th Anniversary Scientific Symposium: Improving Lives Through Discovery.
lo-res | hi-res

Two attendees discuss one of the studies featured in a scientific poster presented at the NIAMS 25th Anniversary Scientific Symposium.
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NIAMS Director Dr. Stephen Katz (c) joins orthopaedic researcher Dr. Tom Clemens (l) and 2011 NIAMS Coalition Lifetime Achievement Award honoree John Edward Porter at a Congressional briefing commemorating the Institute's 25th anniversary.
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Msgr. John Enzler, President and C.E.O. of Catholic Charities of the Archdiocese of Washington, (at podium) spoke at the 10th anniversary

celebration of the NIAMS Community Health Center (CHC) on September 28, 2011. NIH Director Dr. Francis Collins (right) and NIAMS Director Dr. Stephen Katz (left) also spoke at the event. The NIAMS CHC is a health information and medical center located in Silver Spring, MD, providing health care services to people affected by arthritis, lupus, and other rheumatic diseases.

lo-res | hi-res

More than 50 individuals representing 40 organizations attended the NIAMS Coalition 2011 Outreach and Education Meeting: Creating Connections for Science. The event was held on October 11, 2011. The Coalition is a group of more than 70 professional and voluntary organizations concerned with NIAMS programs.

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NIAMS, NHLBI and NIDDK recently co-sponsored The Jak-STAT Pathway: 20 Years from Discovery to Drugs. The event celebrated the 20th year of Jak-STAT research, highlighting recent basic developments in the field, relevance to diseases and new therapeutics. The pathway has become a paradigm in signal transduction, but has also shed light on a number of diseases ranging from immunodeficiencies to hematological malignancies. The 3-day meeting convened an international team of industry, academic and government scientists who focused on the translational advances that have arisen from the basic discoveries of the Jak-STAT pathway. Organizers included (from l) Dr. James Darnell, Rockefeller University; Dr. Richard Jove, City of Hope; Dr. Lothar Hennighausen, NIDDK; Dr. John O'Shea, NIAMS; Dr. David Levy, NYU; and Dr. Warren Leonard, NHLBI.

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Panelists at Reaching Out to Urban Indians: Best Practices in Communications and Partnerships included (from l) Dr. Kristen Nadeau, University of Colorado-Denver; John Burklow, NIH Associate Director for Communications and Public Liaison; Wilbur Woodis, HHS Office of Minority Health; D'Shane Barnett, National Council of Urban Indian Health (NCUIH); Dr. Jami Bartgis, also of NCUIH.

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2010 PHOTOS

The trans-NIH American Indian/Alaska Native (AI/AN) Health Communications and Information Work Group hosted a half-day workshop on December 8, 2010 for NIH communications staff on "Creating Connections: Building Partnerships between the Indian Health Service (IHS) and the National Institutes of Health (NIH)." Speakers and moderators at the 2010 NIH AI/AN Workshop. From left: Wilbur Woodis, OASH; Leo Nolan, IHS; Susan Anderson, IHS; Thomas Sweeney, IHS; Mimi Lising, NIAMS; Ben Smith, IHS; and Marin Allen, OD/OCPL.

lo-res | hi-res

In September 2010, NIAMS, NCI, NIAID and the Office of Research on Women's Health cosponsored "Systemic Lupus Erythematosus: From Mouse Models to Human Disease and Treatment." Organizers included (from l) Dr. Howard Young, NCI; Dr. Silvia Bolland, NIAID; and Dr. Juan Rivera, NIAMS.

lo-res | hi-res

The 2-day meeting at Lister Hill Center brought together basic research scientists working on models of autoimmune disease relevant to systemic lupus erythematosus and clinicians treating lupus patients. The conference generated ideas regarding future steps needed to further lupus research and the use of mouse models.

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2009 PHOTOS

NIAMS researchers Raphaela T. Goldbach-Mansky, M.D., M.H.S. (left) and Nicole Plass, R.N., M.P.A., U.S. Public Health Service, with a DIRA patient. NIAMS' research has led to the identification and successful treatment of DIRA (deficiency of the interleukin-1 receptor antagonist), a genetic autoinflammatory disorder in children.

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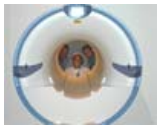

Osteoarthritis Initiative (OAI) researchers at Ohio State University look through the opening of an MRI machine, used to image the knees of patients. The OAI, a public-private partnership, led by NIAMS and the National Institute on Aging with additional support from five other Institutes and Centers, funds research and information sharing resources to aid in the identification of biological markers for osteoarthritis.

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NIAMS Director Stephen I. Katz, M.D., Ph.D., (center left) with former Congressman the Hon. John Porter and the co-chairs of the NIAMS Coalition. Mr. Porter gave the keynote address at the Coalition's Education and Outreach Day, November 3, 2009. The meeting gave NIAMS Coalition members an opportunity to network and share best practices on the importance of connecting science to the public, while learning more about the inner workings of the NIH and NIAMS.

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2007 PHOTOS

In September 2007, NIH Director Dr. Elias Zerhouni and NASA Administrator Dr. Michael D. Griffin signed an agreement making U.S. resources on the International Space Station available for NIH-funded research. Sen. Kay Bailey Hutchison (l), Sen. Barbara Mikulski, and NIAMS Director Dr. Steve Katz witnessed the occasion.

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Mission | History | Director | Programs | Photo Gallery

MISSION

The mission of the National Institute of Biomedical Imaging and Bioengineering (NIBIB) is to improve health by leading the development and accelerating the application of biomedical technologies. The Institute is committed to integrating the physical and engineering sciences with the life sciences to advance basic research and medical care. This is achieved through: research and development of new biomedical imaging and bioengineering techniques and devices to fundamentally improve the detection, treatment, and prevention of disease; enhancing existing imaging and bioengineering modalities; supporting related research in the physical and mathematical sciences; encouraging research and development in multidisciplinary areas; supporting studies to assess the effectiveness and outcomes of new biologics, materials, processes, devices, and procedures; developing technologies for early disease detection and assessment of health status; and developing advanced imaging and engineering techniques for conducting biomedical research at multiple scales.

IMPORTANT EVENTS IN NIBIB HISTORY

December 29, 2000—The National Institute of Biomedical Imaging and Bioengineering Establishment Act (H.R. 1795) is signed into law by President William Jefferson Clinton.

2001—The NIBIB Establishment Plan is approved by the U.S. Secretary of Health and Human Services, Mr. Tommy G. Thompson.

Dr. Donna J. Dean is named as Acting Director of NIBIB.

The National Advisory Council for Biomedical Imaging and Bioengineering is established.

NIBIB assumes administration of the NIH's Bioengineering Consortium (BECON).

The NIBIB website is launched.

2002—A working group is established to review and recommend the transfer of grants to NIBIB.

NIBIB receives its first budget appropriation (FY 2002) in the amount of $112 million.

NIBIB announces its first 2 Requests for Applications.

The NIBIB announces the award of its first research grants.

Dr. Roderic Pettigrew, professor of radiology, medicine (cardiology), and bioengineering, and director of the Emory Center for MR Research, Emory University School of Medicine, assumes the position of Director of NIBIB.

Dr. Donna Dean becomes the first Deputy Director of NIBIB.

2003—The National Advisory Council for Biomedical Imaging and Bioengineering meets for the first time in Bethesda, Maryland.

A new NIBIB organization is announced by Dr. Roderic Pettigrew.

The NIBIB Special Emphasis Panel is established.

Dr. Belinda Seto is named the Deputy Director of NIBIB.

2004—NIBIB initiates its Strategic Planning process.

NIBIB and the Center for Devices and Radiological Health, FDA, sign an interagency agreement establishing the joint Laboratory for the Assessment of Medical Imaging Systems.

NIBIB hosts a Blue Ribbon Panel on Intramural Research to provide recommendations on the planning and development of an intramural research program.

NIBIB and Howard Hughes Medical Institute (HHMI) announce a partnership to support the HHMI/NIBIB Interfaces Initiative for Interdisciplinary Graduate Research Training.

The Positron Emission Tomography (PET) Radiochemistry Group joins the Institute as the NIBIB Intramural Research Program.

NIBIB and the National Science Foundation sponsor a conference on "Research at the Interface of the Life and Physical Sciences: Bridging the Sciences."

2005—NIBIB issues a draft Strategic Plan and invites public comment.

NIBIB holds its first Regional Grantsmanship Seminar in Troy, New York. The seminars are intended to provide an overview of NIBIB funding opportunities and NIH application, review, and grant-making processes and policies.

NIBIB launches re-designed website.

2006—NIBIB awards its first Quantum Grant to Baylor College of Medicine.

NIBIB names Dr. Richard Leapman as Scientific Director of the Intramural Sciences Program.

NIBIB publishes its first strategic plan, *Strategic Plan I*, following a year-long process of input from the public, staff, and groups of outside experts. This plan is designed to (1) define key goals, (2) optimize the use of resources, and (3) install tools and processes for smart management in order to help NIBIB achieve its mission and realize its vision.

NIBIB website wins Award of Distinction from *The Communicator Awards*.

2007—NIBIB celebrates its 5-year anniversary with a commemorative scientific symposium on technological innovation in medicine entitled, "Changing the World's Healthcare through Biomedical Technologies." View Image.

NIBIB presents the first NIBIB Landmark Achievement Award to Dr. Paul Lauterbur (posthumously), 2003 Nobel Laureate, Physiology or Medicine, for his vision and fundamental discoveries in the development of magnetic resonance imaging. View Image.

The Division of Bioengineering and Physical Science is transferred from the NIH Office of Research Services to the NIBIB intramural research program.

NIBIB and the Department of Biotechnology of the Ministry of Science and Technology, Republic of India, sign a bilateral agreement to develop low-cost healthcare technologies aimed at the medically underserved. View Image.

2008—NIBIB enters into a cooperative agreement with the U.S. Department of Defense and the Office of Naval Research to support and manage the Armed Forces Institute of Regenerative Medicine (AFIRM). Over the next 5 years, AFIRM will provide $8.5 million per year for research in the field of regenerative medicine.

NIBIB holds the first Quantum Grantees' meeting.

NIBIB's Point-of-Care Technologies Network holds a first-year meeting to discuss progress and future plans.

NIBIB and the Department of Biotechnology of the Ministry of Science and Technology, Republic of India, hold a 2-day workshop entitled "Low-Cost Diagnostic and Therapeutic Medical Technologies," in Hyderabad, India, aimed at promoting U.S./Indian scientific collaborations in the development of low-cost diagnostics and therapeutics.

2009—NIBIB hosts the first in a series of forums on Technology Translation. The first forum focused on the role of public-private partnerships in the development and translation of in-vitro diagnostic technologies.

NIBIB provides support for the RSNA RadLex Ontology Project, which will provide a uniform source of terms and concepts for indexing and retrieving imaging information sources.

The Neuroimaging Tools and Resources Clearinghouse (NITRC) wins the 2009 Excellence in Government Award from the American Council for Technology. NITRC is supported by the NIH Blueprint for Neuroscience Research and managed by NIBIB. View Image.

NIBIB awards ten grants in Phase II of the NIBIB-HHMI Interfaces Initiative for Interdisciplinary Graduate Research Training.

2010—NIBIB announced a new training initiative in Team-Based Design in Biomedical Engineering Education.

NIBIB established a collaboration with Wellcome Trust to solve key medical engineering challenges facing healthcare.

NIBIB received $3M from DHHS to fund imaging-based comparative effectiveness research to improve clinical decision-making.

2011—In a first in human study a man with a paralyzing spinal cord injury is able to stand and move muscles after intensive physical therapy and electrical

stimulation to the spine. This breakthrough research is supported by an NIBIB Bioengineering Research Partnership grant at University of California Los Angeles. Watch the video.

With NIBIB contract support, the RSNA Image Share Network enrolled the first patients to test a new system that allows patients to have complete access to their imaging reports and share them with physicians anywhere in the world.

NIBIB and the Office of National Coordinator held a workshop on Images, Electronic Health Records and Meaningful Use.

NIBIB co-organized a Summit on Management of Radiation Dose in Computerized Tomography: Toward the Sub-mSv Exam.

2012—NIBIB marks its Tenth Anniversary with A Decade of Innovation for Health — a science symposium and technology showcase featuring patient testimonials, video interviews with investigators, and presentations by premier leaders in academia and government.

NIBIB announced the winners of its first DEBUT challenge, a biomedical engineering design competition for teams of undergraduate students. Watch the video.

NIBIB Intramural Research lab wins video award and recognition from The Scientist magazine for advances in light microscopy that allows the mapping of cell migration during embryogenesis and capture dynamic processes at the cellular level. Watch the video.

NIBIB publishes its second Strategic Plan.

BIOGRAPHICAL SKETCH OF NIBIB DIRECTOR RODERIC I. PETTIGREW, PH.D., M.D.

Roderic I. Pettigrew, Ph.D., M.D., is the first Director of the National Institute of Biomedical Imaging and Bioengineering at the NIH. In 2013, Dr. Pettigrew also began serving as the Acting Chief Officer for Scientific Workforce Diversity. This new position at NIH was established for the coordination and oversight of NIH programs and activities designed to address the unique diversity and inclusion challenges of the biomedical research workforce.

Prior to his appointment at the NIH, he was Professor of Radiology, Medicine (Cardiology) at Emory University and Bioengineering at the Georgia Institute of Technology and Director of the Emory Center for MR Research, Emory University School of Medicine, Atlanta, Georgia.

Dr. Pettigrew is known for his pioneering work at Emory University involving four-dimensional imaging of the cardiovascular system using magnetic resonance (MRI). Dr. Pettigrew graduated cum laude from Morehouse College with a B.S. in Physics, where he was a Merrill Scholar; has an M.S. in Nuclear Science and Engineering from Rennselear Polytechnic Institute; and a Ph.D. in Applied Radiation Physics from the Massachusetts Institute of Technology, where he was a Whitaker Harvard-MIT Health Sciences Scholar. Subsequently, he received an M.D. from the University of Miami School of Medicine in an accelerated two-year program, did an internship and residency in internal medicine at Emory University and completed a residency in nuclear medicine at the University of California, San Diego. Dr. Pettigrew then spent a year as a clinical research scientist with Picker International, the first manufacturer of MRI equipment, where he helped develop their first cardiac imaging technology. In 1985, he joined Emory as a Robert Wood Johnson Foundation Fellow with an interest in non-invasive cardiac imaging. His current research focuses on integrated imaging and predictive biomechanical modeling of coronary atherosclerotic disease.

Dr. Pettigrew's awards include membership in Phi Beta Kappa, the Bennie Award (Benjamin E. Mays) for Achievement, and being named the Most Distinguished Alumnus of the University of Miami (1990). He was the Radiological Society of North America's 75th Diamond Jubilee Eugene P. Pendergrass New Horizons Lecturer. He is also the recipient of the Herbert Nickens Award of the ABC, the Pritzker Distinguished Achievement Award of the Biomedical Engineering Society, and the Distinguished Service Award of the National Medical Association. He has been elected to membership in two components of the US National Academies: the Institute of Medicine, and the National Academy of Engineering.

NIBIB DIRECTORS

Name	In Office from	To
Donna J. Dean (Acting)	April 26, 2001	September 22, 2002
Roderic I. Pettigrew	September 23, 2002	Present

NIBIB PROGRAMS

Extramural Research

The NIBIB extramural research program brings together the research communities of biomedical imaging, bioengineering, the physical sciences, and the life sciences to advance human health by improving quality of life and reducing the burden of disease. The extramural research program is organized into four divisions: Discovery Science and Technology, Applied Science and Technology, Inter-Disciplinary Training, and Health Information Technology.

The Institute supports basic research and research training through investigator-initiated grants, contracts, program project and center grants, and career development and training awards.

Intramural Research

The NIBIB Intramural Research Program plays a key role in advancing the Institute's mission. Specifically, the program advances knowledge in imaging and bioengineering research using a combination of basic, translational, and clinical science. The intramural research program has also developed several unique training

opportunities in these and related fields.

The Intramural Research Program has expertise that spans technologies ranging in scale from near-atomic resolution to intact organisms. Current research areas include: molecular imaging probe development; nano theranostics; cardiovascular imaging; high resolution optical imaging; biophotonics; supramolecular structure and function; dynamics of macromolecular assembly; complex biological systems; immunochemical nanoscale analysis and diagnostics; pharmacokinetics and drug delivery; and non-invasive optical imaging.

NIBIB's Intramural Research Program offers training opportunities at several educational levels:

- Imaging Sciences Training Program — a joint NIBIB/NIH Clinical Center program for MDs and PhDs seeking research careers in clinical, translational, and basic imaging research. www.cc.nih.gov/drd/training/index.html
- Research Associate Program — a joint NIH/NIST program for postdocs. www.training.nih.gov/postdoctoral/nist.asp
- Biomedical Engineering Summer Internship Program — for college students completing their junior year in a bioengineering program. www.nibib.nih.gov/Training/UndergradGrad/besip/home

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National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Recent Photos from the National Institute of Biomedical Imaging and Bioengineering (NIBIB)

2009 PHOTOS

NITRC wins 2009 Excellence in Government Award. Front row l to r: David Cassidy, James Luo, Nina Preuss. Second row: l to r: Christian Haselgrove, David Kennedy, Daniel Turner.
lo-res

2007 PHOTOS

At NIBIB's 5th Anniversary Symposium, held in June 2007, NIBIB Director Dr. Roderic Pettigrew (l) chatted with special guest speaker Dr. Charles Townes, recipient of the 1964 Nobel Prize in Physics for his discovery of the laser.
lo-res | hi-res

In June 2007, NIBIB Director Dr. Roderic Pettigrew (l) presented the first NIBIB Landmark Achievement Award to M. Joan Dawson, wife of the late Dr. Paul Lauterbur. As a 2003 Nobel Laureate in Physiology or Medicine, Dr. Lauterbur was recognized for his pioneering contributions to the development of magnetic resonance imaging.
lo-res | hi-res

At a meeting in New Delhi, Dr. Maharaj Bhan (l), Secretary of the Republic of India's Department of Biotechnology, Ministry of Science, shakes hands with NIBIB Director Dr. Roderic Pettigrew following the signing of a bilateral agreement in 2007. Witnessing the occasion (left to right) were Steven White, Deputy Chief of Mission, U.S. Embassy, New Delhi; Elias Zerhouni, NIH Director; Kapil Sibal, Science Minister; T.S. Rao, Medical Biotechnology Group Leader; and Roger Glass, Director of NIH's Fogarty International Center.
lo-res | hi-res

This page last reviewed on February 24, 2011

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Eunice Kennedy Shriver National Institute of Child Health and Human Development

Mission | Important Events | Legislative Chronology | Director | Programs | Photo Gallery

MISSION

The mission of the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD) is to ensure that every person is born healthy and wanted, that women suffer no harmful effects from the reproductive process, that all children have the chance to fulfill their potential to live healthy and productive lives free from disease or disability, and to ensure the health, productivity, independence, and well-being of all people through optimal rehabilitation.

In pursuit of this mission, the NICHD conducts and supports laboratory research, clinical trials, and epidemiological studies that explore health processes; examines the impact of disabilities, diseases, and defects on the lives of individuals; and sponsors training programs for scientists, doctors, and researchers to ensure that NICHD research can continue.

NICHD research programs incorporate the following concepts:

- **Events that happen prior to and throughout pregnancy, as well as during childhood, have a great impact on the health and well-being of children and adults.** The Institute supports and conducts research to: advance knowledge of pregnancy, fetal development, and birth for developing strategies that prevent maternal, infant, and childhood mortality and morbidity; identify and promote the prerequisites of optimal physical, mental, and behavioral growth and development through infancy, childhood, and adolescence; and contribute to the prevention and amelioration of mental retardation and developmental disabilities.
- **Human growth and development is a life-long process that has many phases and functions.** Much of the research in this area focuses on cellular, molecular, and developmental biology to build understanding of the mechanisms and interactions that guide a single fertilized egg through its development into a multi-cellular, highly organized adult organism.
- **Learning about the reproductive health of women and men and educating people about reproductive practices is important to both individuals and societies.** Institute-supported basic, clinical, and epidemiological research in the reproductive sciences seeks to develop knowledge that enables women and men to overcome problems of infertility, and to regulate their fertility in ways that are safe, effective, and acceptable for various population groups. Institute-sponsored behavioral and social science research in the population field strives to understand the causes and consequences of reproductive behavior and population change.
- **Developing medical rehabilitation interventions can improve the health and well-being of people with disabilities.** Research in medical rehabilitation seeks to develop improved techniques and technologies, with respect to the rehabilitation of individuals with physical disabilities resulting from diseases, disorders, injuries, or birth defects.

The Institute also supports research training across all its programs, with the intent of adding to the cadre of trained professionals who are available to conduct research in areas of critical public health concern. In addition, an overarching responsibility of the NICHD is to disseminate information that emanates from Institute research programs to researchers, practitioners, other health care professionals, and the public.

IMPORTANT EVENTS IN NICHD HISTORY

January 12, 1961—The report of the Task Force on Health and Social Security calls for the establishment, by administrative action of the U.S. Surgeon General, of a National Institute of Child Health within the National Institutes of Health (NIH).

January 30, 1961—The U.S. Department of Health, Education, and Welfare (DHEW) general counsel declares that existing legislation (enacted in 1950) limited the creation of new Institutes to those focusing on a disease or group of diseases, and that new legislation would be required to establish the Institute called for in the Task Force report.

February 17, 1961—The Surgeon General establishes a Center for Research in Child Health in the Division of General Medical Sciences.

October 17, 1962—Public Law 87-838 authorizes the establishment of the NICHD.

January 30, 1963—Secretary of DHEW Anthony J. Celebrezze approves the establishment of the NICHD, with a provision that the Center for Research in Child Health and the Center for Research in Aging (established in 1956) be transferred from the Division of General Medical Sciences to the new Institute.

May 1963—The Surgeon General appoints members of the National Advisory Child Health and Human Development (NACHHD) Council.

November 14, 1963—The NICHD holds the first meeting of the NACHHD Council.

December 1965—A major NICHD reorganization, approved by the Surgeon General, emphasizes four program areas: reproduction, growth and development, aging, and mental retardation.

April 1967—A second reorganization of the NICHD, approved by the Surgeon General, acknowledges the Institute's intramural research programs by separating responsibility for intramural and extramural research and creating seven intramural laboratories. The reorganization brings the NICHD administrative structure into line with that of other NIH Institutes.

August 9, 1968—The DHEW Secretary establishes the Center for Population Research within the NICHD. The Center is responsible for contract and grant programs in population and reproduction research and is designated by the president as the federal agency primarily responsible for population research and training.

1970—The NICHD's Epidemiology and Biometry Branch, created during the Institute's second reorganization in 1967, becomes the Epidemiology and Biometry Research Program. The change allows the Program to conduct epidemiologic, behavioral, and biometric studies relating to reproductive, maternal, and child health.

May 27, 1975—The federal government establishes the Center for Research for Mothers and Children within the NICHD as the focal point for research and research training on the special health problems of mothers and children. The Center also has responsibility for increasing knowledge about pregnancy, infancy, childhood, adolescence, and adulthood, and for administering grant and contract programs related to these areas.

June 30, 1975—The Adult Development and Aging Branch and the Gerontology Research Center, with their programs for support and conduct of research in the field of aging, are transferred from the NICHD to the newly established National Institute on Aging (NIA).

1978—NICHD intramural researchers become the first to successfully clone a mammalian gene, a critical first step in obtaining large amounts of medically important proteins.

December 1983—NICHD grantees Ralph Brinster and Richard Palmiter become the first to transplant human genes into animals. Their accomplishment, transplanting the gene for human growth hormone into mice, provides an important new means to study the function of human genes, as well as the foundation of the new biotechnology industry.

1985—The NICHD forms research networks of Neonatal Intensive Care Units and Maternal-Fetal Medicine Units. The networks, which perform large clinical trials, provide the Institute with a faster, more effective system of evaluating neonatal intensive care and maternal-fetal treatments.

December 1989—The NICHD announces the establishment of the country's first research centers that combine the biomedical and behavioral sciences to focus specifically on learning disabilities.

September 1990—The Institute begins a congressionally initiated national program of Child Health Research Centers. The goal is to expedite the application of findings from basic research to the care of sick children.

November 16, 1990—Congress establishes the National Center for Medical Rehabilitation Research within the NICHD to conduct and support programs for the rehabilitation, health, and well being of individuals with physical disabilities.

1991—The NICHD expands its Epidemiology and Biometry Research Program to create the Division of Epidemiology, Statistics, and Prevention Research, part of its intramural research component. The Division's portfolio includes research in the fields of reproduction and maternal and child health.

1994—The NICHD launches the *Back to Sleep* campaign, a program designed to teach parents and caregivers the importance of putting babies on their backs to sleep, to help reduce the risk of sudden infant death syndrome (SIDS).

January 1994—In response to the need for appropriate drug therapy for pediatric patients, the NICHD establishes the Pediatric Pharmacology Research Unit Network. The Network's mission is to facilitate and promote pediatric labeling of new drugs or drugs already on the market, to ensure the safe and effective use of drugs in children.

September 1996—Two NICHD scientists, Drs. John Robbins and Rachel Schneerson, receive the 1996 Albert Lasker Clinical Medical Research Award for the landmark development of a polysaccharide-protein conjugate vaccine for *Hemophilus influenzae* type b (Hib). Also in 1996, Robbins and Schneerson receive the World Health Organization Children's Vaccine Initiative Pasteur Award for Recent Contributions in Vaccine Development for their Hib vaccine breakthrough.

1997—The NICHD launches the *Milk Matters* calcium education campaign, designed to educate people about the importance of getting enough calcium during the childhood and teenage years to help prevent osteoporosis and fragile bones in adulthood.

June 1997 –The NICHD and the National Institute on Deafness and Other Communication Disorders (NIDCD) establish the Network on the Neurobiology and Genetics of Autism, composed of 10 Collaborative Programs of Excellence in Autism (CPEAs). The CPEA Network is a multi-million dollar, international effort that seeks to solve the puzzle of autism through research.

September 1997—The NICHD initiates the first phase of its National Longitudinal Study of Adolescent Health (called the Add Health Study). The study's main

premise is that social context—such as relationships with families, friends, and peers—influences the health-related behaviors of young people, and that understanding this context is essential to guide efforts to modify health behaviors.

March 1998—Using sophisticated brain imaging technology, NICHD-funded researchers reveal a brain map of the physical basis of dyslexia. This finding may provide the basis for screening techniques that will help identify dyslexia, allowing treatment to start earlier in a person's development.

June 1998—In the largest, most comprehensive analysis of its kind, NICHD-funded research finds that pregnant women who are infected with HIV can reduce the risk of transmitting the virus to their infants by about 50% if they deliver by elective Cesarean section before they have gone into labor and before their membranes have ruptured.

July 1998—The Food and Drug Administration approves an NICHD-developed DTaP (diphtheria-tetanus-acellular pertussis) vaccine for use in immunization against these diseases.

September 1999—NICHD-funded researchers announce the discovery of the gene for Rett syndrome, a disorder in which healthy infant girls gradually lose their language capabilities, mental functioning, and ability to interact with others.

2000—NICHD researchers demonstrate that inhaled nitric oxide is an effective therapy for respiratory failure in critically ill term infants in whom aggressive conventional therapy had failed. The findings, which resulted from the first definitive, randomized clinical trial of nitric oxide use in human neonates, may further reduce the long-term costs of caring for such children and improve their quality of life by reducing their risk for chronic respiratory insufficiency and central nervous system ischemia.

2000—NICHD researchers evaluating data from the Fels Longitudinal Study, the oldest and largest growth study in the world, find that obesity in childhood tracks from age three years onward, into adulthood, and that obesity in adolescence is more likely to lead to adult obesity than obesity earlier in childhood. Data from the study, supported by NICHD since 1974, may allow researchers to ascertain the segregation of growth patterns over three generations, to detect linkage of candidate genes to various phenotypes of growth, and to permit the discovery of new descriptors of normal growth and underlying genetic mechanisms.

January 2000—The Bill and Melinda Gates Foundation joins the NICHD in developing and supporting an international research network to improve the health of women and children throughout the world. The NICHD will match the Foundation's $15 million to help the network establish self-sustaining, international, and medical research institutions, which are urgently needed to address many of the world's health concerns.

April 2000—The National Reading Panel, established by the NICHD, releases findings of the largest, most comprehensive, evidence-based review ever conducted of research related to how children learn to read. The independent panel concludes that the most effective way to teach children to read is through instruction that includes a combination of methods and addresses alphabetics (phonemic awareness and phonemic instruction), reading fluency, reading comprehension, teacher education, and computer technology.

October 2000—An NICHD-funded study, conducted by researchers from Thailand, France, and the United States, shows that transmission of HIV from a mother to her child can be reduced nearly as effectively with shorter treatments of the drug AZT, as with longer AZT treatments. The findings may allow women in developing countries to better afford the treatment that can reduce their babies' chances of contracting AIDS.

October 2000—An NICHD grantee, Dr. James J. Heckman of the University of Chicago, is 1 of 2 NIH researchers to receive the Bank of Sweden Prize in Economic Sciences in memory of Alfred Nobel. Dr. Heckman is awarded the Nobel Prize in Economics for his pioneering work in accounting for unknown factors affecting statistical samples. Much of his work has been applied to understanding how early life events contribute to individuals' later earning potential and economic standing.

February 2001—The NICHD establishes three Fragile X research centers to conduct and support research related to improving the diagnosis and treatment of, and finding a cure for, fragile X and fragile X syndrome. This initiative was mandated under Public Law 106-310, the Children's Health Act, passed in October 2000.

April 2001—A typhoid vaccine developed by NICHD scientists showed a 91.5% effectiveness rate, the highest reported for any typhoid vaccine, in clinical trials done in Vietnam. More than 16 million people worldwide are affected by typhoid every year. This highly effective vaccine could prevent the more than 600,000 deaths that result annually from typhoid fever around the world.

February 2002—NICHD scientists, in conjunction with the biologics firm Nabi, develop the first vaccine against *Staphylococcus aureus*, a major cause of infection and death in hospital patients. *S. aureus*—which can cause illness ranging from minor skin infections to life-threatening pneumonia, meningitis, and infections of the heart—attacks people whose immune systems are compromised. This new vaccine provides a powerful new way to prevent these infections, a finding which could save thousands of lives every year.

June 2002—Findings from the NICHD's Women's Contraceptive and Reproductive Experiences Study (Women's CARE) reveal no association between oral contraception use and an increased risk of breast cancer. The study, which focuses on women age 35 to 64 because they are more likely to develop breast cancer than younger women, provides scientific evidence that past or present oral contraception use does not significantly increase breast cancer risk.

2003—In a first-of-its-kind collaboration, the NICHD, National Coalition of 100 Black Women, the Women in the NAACP, and Alpha Kappa Alpha Sorority, Inc., embark on a year-long program to spread the safe sleep message in African American communities. At regional summits held in Tuskegee, Los Angeles, and Detroit, the partners conduct SIDS risk-reduction training and activities to equip members and community leaders with educational techniques, strategies, and promotional materials so they can conduct outreach activities to reduce the risk of SIDS among African American infants.

June 2003—The NICHD establishes the Center for Developmental Biology and Perinatal Medicine. The Center strives to advance fundamental and clinical knowledge about maternal health and problems of child development, such as preterm birth, mental retardation and developmental disabilities, congenital defects and genetic disorders, fetal growth restriction, and other conditions.

April 2004—NICHD-supported researchers demonstrate that effective reading instruction not only improves reading ability, but also changes the functioning of the brain so that it reads more efficiently. The scientists used functional magnetic resonance imaging (fMRI) to observe brain functions in children during reading. With fMRI, the researchers could see that the brains of once-poor readers, as they overcame their reading disabilities, began to function like the brains of good readers. The findings show that the brain systems involved in reading respond to effective reading instruction and show increased activity in a part of the brain that recognizes words.

June 2004—Reorganization within the NICHD's Center for Research for Mothers and Children establishes the Obstetric and Pediatric Pharmacology Branch to meet the increased demand for research leadership and support of legislation passed to ensure the safety of drugs used to treat children. The new Branch includes the NICHD Pediatric Pharmacology Research Units Network, the Obstetric-Fetal Pharmacology Research Network, and NICHD Best Pharmaceuticals for Children Act activities. The Branch provides a focus for managing efforts across the U.S. Department of Health and Human Services (HHS) to address this important topic.

November 2004—The NICHD and its partner agencies announce the 96 recruitment locations for the National Children's Study, a national, longitudinal study of environmental influences on child health mandated in the Children's Health Act of 2000. The study, led by a consortium of federal agencies—including HHS (the NICHD and the National Institute of Environmental Health Sciences (NIEHS) within NIH, as well as the Centers for Disease Control and Prevention) and the U.S. Environmental Protection Agency—will be the largest and most comprehensive of its kind.

December 2004—Researchers in the NICHD Maternal-Fetal Medicine Units (MFMU) Network find that the risks from vaginal delivery after a prior Cesarean delivery are low, and are only slightly higher than for a repeat Cesarean delivery, thus clarifying the safety of vaginal birth after Cesarean. The largest, most comprehensive study of its kind indicated that, although complications (such as rupture of the uterus and infection of the uterine lining) were possible, the risk of these complications was very low. Further, the researchers noted that repeat Cesarean carries its own risks, including infection and surgical complications, and that the procedure may complicate future births. The MFMU Network allows researchers to conduct large clinical trials quickly, by recruiting from multiple sites and using one protocol, providing a faster, more effective system of evaluating maternal-fetal treatments.

January 2005—NICHD-supported researchers identify a substance—placental growth factor (PlGF)—in the urine of pregnant women that can be measured to predict the later development of preeclampsia, the leading cause of maternal and fetal death in the United States. This finding sets the stage for the development of a test to screen women for risk of preeclampsia. Such foreknowledge will help physicians to better care for the women, possibly taking steps to prolong the pregnancy to allow the fetus to develop more, while closely monitoring them for signs that the fetus should be delivered, even prematurely, if necessary.

April 7, 2005—World Health Day—the Global Network for Women's and Children's Health Research, funded by the NICHD and the Bill and Melinda Gates Foundation, initiates the First Breath Project to treat newborn asphyxia, a major cause of infant death, in resource-poor settings. The new project seeks to determine if training midwives and other traditional birth attendants in standard infant resuscitation practices commonly used in the United States can reduce the death and disability from newborn asphyxia in seven Global Network sites located in South Asia, Africa, and Latin America. The project will include nearly 80 communities and 40,000 births per year during the course of the study.

October 2006—As part of a decades-long research effort on SIDS, NICHD-funded researchers announce findings that infants who died of SIDS had abnormalities in the brainstem, a part of the brain that helps control heart rate, breathing, blood pressure, temperature, and arousal. The finding supports the concept that SIDS risk may greatly increase when an underlying predisposition combines with an environmental risk at a developmentally sensitive time in early life. Modifiable factors, such as sleep position, may provide the greatest protection against SIDS for infants with the brain abnormality.

December 2006/February 2007—NICHD researchers discover two genetic defects that lead to forms of Osteogenesis Imperfecta (OI), a disorder that weakens bones and may cause frequent fractures. The first gene discovery—a recessive form that requires two copies of the affected gene to show the trait—was implicated in a previously unexplained but fatal form of OI; the second was related to other previously unexplained forms of the disorder. Although there is no treatment for the disorder, the finding allows clinicians to test families who have lost a child to OI for the presence of the defective gene. Couples with a child affected by these forms of OI could be apprised of their risk for conceiving another child with the disorder.

June 2007—At the recommendation of the Blue Ribbon Panel Review and the Board of Scientific Counselors, the NICHD Division of Intramural Research was reorganized from 22 laboratories and branches to 10 programs, along with three branches, two sections, and three core facilities.

August 2007—The NIH initiates the Autism Centers of Excellence (ACE) Program, a consolidation of two existing programs, the Studies to Advance Autism Research and Treatment (STAART) and Collaborative Programs of Excellence in Autism (CPEA), into a single research effort. The ACE Program seeks to expand on earlier discoveries made by research previously supported by the NIH. Funding and resources for the Program are provided by the NICHD, along with NIDCD, NIEHS, the National Institute of Mental Health, and the National Institute of Neurological Disorders and Stroke.

September 2007—The National Children's Study, led by the NICHD and a consortium of federal agencies, awards contracts to 22 new study centers, which will manage participant recruitment and data collection in 26 additional communities across the United States. Congress appropriated $69 million in fiscal year 2007 for the new Study centers and the Study's initial phase. The National Children's Study is the largest study to be conducted on the effects of environmental and genetic factors on child and human health in the United States.

January 2008—The NIH, led by the NICHD, releases a research plan to advance understanding of Down syndrome and speed development of new treatments for the condition, which is the most frequent genetic cause of mild to moderate intellectual disability and associated medical problems. The plan sets research goals for the next 10 years that build upon earlier research advances fostered by the NIH. Among the plan elements are the need for increased research on the medical, cognitive, and behavioral conditions that occur in people with Down syndrome and the need to study whether aging has a greater impact on mental processes in people with Down syndrome than in people who do not have Down syndrome.

April 2008—The NIH announces recipients of grants from the Autism Centers of Excellence (ACE) program. These grants will support studies covering a broad range of autism research areas, including early brain development and functioning, social interactions in infants, rare genetic variants and mutations, associations between autism-related genes and physical traits, possible environmental risk factors and biomarkers, and a potential new treatment. The ACE program encompasses

research centers and research networks, which both rely on collaborations among teams of autism researchers working together on a single research question.

June 2008—The NICHD serves as the scientific lead for the *Surgeon General's Conference on the Prevention of Preterm Birth.* The aim of the conference was to establish an agenda for activities in both the public and private sectors to speed the identification of, and treatments for, the causes of and risk factors for preterm labor and delivery. The agenda calls for a national system to better understand the occurrence of preterm birth and a national education program to help women reduce their chances of giving birth prematurely. The agenda also calls for improved methods for estimating the age of the fetus, and studies to identify biomarkers which would signal the beginning of preterm labor.

July 2009—The NIH, led by the NICHD, releases a research plan to advance the understanding of Fragile X syndrome and its associated conditions, Fragile X-associated Tremor/Ataxia Syndrome and Fragile X-associated Primary Ovarian Insufficiency. The plan sets research priorities for each condition and includes investigating the biological processes underlying all three disorders and how to better diagnose and treat them. Other priorities are studying how widespread the gene variations are in the population and how the three conditions affect families.

October 2009—The NICHD and NIH communities joined members of the newborn screening research community and the Hunter's Hope community—the foundation started by National Football League Pro Football Hall-of-Fame quarterback Jim Kelly and his wife Jill after their son Hunter was diagnosed with a rare, degenerative, fatal genetic disease—in inaugurating the *Hunter Kelly Newborn Screening Research Program*. The Program aims to identify new screening technologies and research management strategies for the conditions that such screening can detect.

July 22, 2010—NIH Director Francis Collins, M.D., Ph.D., appoints Alan Guttmacher, M.D., as the new Director of the NICHD. Prior to his appointment as NICHD Acting Director in 2009, Dr. Guttmacher served as the Deputy Director (and before that, Acting Director) of the National Human Genome Research Institute (NHGRI) and served as that Institute's for more than a year. As Deputy and Acting Director of NHGRI, Dr. Guttmacher oversaw that Institute's efforts to advance genome research, integrate the benefits of genome research into health care, and explore the ethical, legal, and social implications of human genomics.

August 2010—NICHD-supported researchers—for the first time—are able to activate dormant mouse egg cells at the earliest stage of their development and bring them to full maturity within the laboratory. Researchers then fertilize and transfer the eggs into female mice, resulting in the birth of healthy offspring. In a related experiment, the researchers also mature follicles on human ovary tissues into viable egg cells in the laboratory.

February 9, 2011—Results from an NICHD-funded study show the benefits and risks of prenatal surgery to repair myelomeningocele, the primary defect in the most severe form of spina bifida. Researchers in the Management of Myelomeningocele Study (MOMS) compared outcomes from the standard postnatal surgery treatment to outcomes from surgery done while the baby is still in the womb. The study shows that, despite a slight increase in risk for preterm delivery, mother and baby have better overall outcomes if the surgery is done before birth.

August 2011—Constantine A. Stratakis, M.D., D.Sc., is named Scientific Director and Director of the Division of Intramural Research (DIR). Dr. Stratakis served as the Acting Scientific Director of the DIR since June 2009.

December 13, 2011—The National Center for Medical Rehabilitation Research (NCMRR) within the NICHD marks its 20th anniversary with a scientific symposium. The event provides a forum for discussions of the Center's founding and history, early years, and scientific accomplishments and features some of the leading names in rehabilitation research.

May 16, 2012—A paralyzed woman is able to direct a robotic arm using only her thoughts, as a result of NICHD-funded research into a brain-computer interface program called BrainGate2. This type of neural interface system, consisting of a sensor to monitor brain signals and computer software and hardware to turn these signals into digital commands for external devices, represents a major advance for rehabilitation research and provides real hope for restoring some level of everyday function to people with limb paralysis.

September 2012—The NICHD and its collaborators expand the Back to Sleep campaign, which focused on sudden infant death syndrome (SIDS), into the Safe to Sleep campaign, with a broader emphasis on SIDS, safe sleep environments, infant health, and other sleep-related causes of infant death.

December 5, 2012—The Institute commemorates the 50th anniversary of its founding with a series of volunteer activities and events related to the NICHD's mission. These activities culminate with a scientific colloquium that features the NIH and NICHD Directors, renowned researchers, Nobel laureates, and former NICHD leadership. At the same time, the Institute releases a Scientific Vision Statement, which was created in collaboration with Institute colleagues following in-depth discussions, identifying the most promising scientific opportunities of the next decade across the breadth of the NICHD mission.

December 2012—NICHD reorganizes its extramural research program, consolidating the former Center for Population Research, Center for Research for Mothers and Children, and Center for Developmental Biology and Perinatal Medicine into the Division of Extramural Research and adding two new Branches to the 12 that had existed in the three separate Centers. The Division will be led by Catherine Spong, M.D., who was appointed as the Associate Director for Extramural Research in September 2012.

NICHD LEGISLATIVE CHRONOLOGY

October 17, 1962—Public Law 87-838 authorizes the U.S. Surgeon general, with approval of the Secretary of the DHEW, to "establish in the Public Health Service (PHS) an institute for the conduct and support of research and training relating to maternal health, child health and human development, including research and training in the special health problems and requirements of mothers and children and in the basic sciences relating to the processes of human growth and development, including prenatal development."

October 31, 1963—Public Law 88-164 provides grants to support the construction of research centers for mental retardation and related disabilities. The NICHD remains closely associated with some 12 centers installed prior to June 30, 1967, when the authority expires.

December 24, 1970—Public Law 91-572 adds Title X to the PHS Act to authorize grants and contracts for research and research training in family planning and population problems. The DHEW Secretary delegates the authority to the NICHD, where the program is administered by the Center for Population Research.

April 22, 1974—Public Law 93-270 assigns the task of conducting research on SIDS and reporting on it to the Congress to the DHEW Secretary and, ultimately, to the NICHD.

July 29, 1975—Title II of Public Law 94-63, the Family Planning and Population Research Act of 1975, amends Title X of the PHS Act. Thereafter the PHS can conduct and support population research. Title X becomes the sole authority for population research appropriations.

August 13, 1981—The Budget Reconciliation Act of 1981, Public Law 97-35, repeals sections 1004(b)(1) and 1004(b)(2) of the PHS Act. Once enacted, authority for supporting research in human reproduction and the population sciences derives from the broad provisions of sections 301 and 441 of the PHS Act.

November 20, 1985—The Health Extension Act of 1985 directs the NICHD to appoint an Associate Director for Prevention, "to coordinate and promote the programs in the Institute concerning the prevention of health problems of mothers and children."

November 16, 1990—Section 3 of the NIH Amendments of 1990, Public Law 101-613, establishes the National Center for Medical Rehabilitation Research. The Center will conduct and support programs with respect to the rehabilitation of individuals with physical disabilities that result from congenital defects, diseases, or disorders of the neurological, musculoskeletal, cardiovascular, pulmonary, or any other physiological system.

June 10, 1993—The NIH Revitalization Act of 1993, Public Law 103-43, mandates the NICHD to do the following: 1) establish contraception research centers to improve methods of contraception; establish infertility research centers to improve methods of diagnosis and treatment of infertility; and establish an educational loan repayment program for extramural and intramural health professionals who agree to conduct contraception or infertility research; 2) establish and maintain an intramural laboratory and clinical research program in obstetrics and gynecology within the Institute; 3) establish and support a program of Child Health Research Centers; and 4) undertake a national prospective, longitudinal study of adolescent health and well-being.

October 17, 2000—President Clinton signs Public Law 106-310, the Children's Health Act, which designates the NICHD as the lead organization on a number of research initiatives, including establishment of a pediatric research initiative, expansion of autism-related and Fragile X syndrome research activities, and authorization for the NICHD to lead other federal agencies in conducting a national longitudinal study of environmental influences on child health.

December 18, 2001—President George W. Bush signs Public Law 107-84, the Muscular Dystrophy Community Assistance, Research and Education Amendments of 2001, which directs the NIH Director, in coordination with the National Institute of Neurological Disorders and Stroke, the National Institute of Arthritis and Musculoskeletal and Skin Diseases, and the NICHD, to expand research activities at NIH pertaining to various types of muscular dystrophy. This expansion is to include the formation of an inter-agency coordinating committee and the establishment of centers of excellence to conduct research. The law also mandates a contract with the Institute of Medicine to study and report on the impact of and need for centers of excellence at the NIH.

January 4, 2002—The Best Pharmaceuticals for Children Act (Public Law 107-109) seeks to improve the safety and efficacy of pharmaceuticals for children. The law authorizes funding for the NIH to conduct testing of drugs already on the market, including at federally funded facilities, such as the NICHD's Pediatric Pharmacology Research Units.

January 8, 2002—President Bush signs the No Child Left Behind Act (Public Law 107-110). Among the education legislation's many provisions is authorization for programs that build upon the reading readiness research funded by the NICHD, as well as on findings from the National Reading Panel, established and supported by the NICHD.

December 3, 2003—The President authorizes the Pediatric Research Equity Act (Public Law 108-155), which codifies a policy of requiring pharmaceutical companies to test new drugs in pediatric populations, if the drugs are likely to be used to treat children, and to provide the data to the federal government. This law complements the Best Pharmaceuticals for Children Act, in which the NICHD plays a central role.

December 3, 2004—The President signs the Individuals with Disabilities Education Improvement Act (IDEA) of 2004 (Public Law 108-446). Among the many provisions in this reauthorization of IDEA activities, the Act also amends the section of the Children's Health Act of 2000 specific to the National Children's Study. This amendment requires the U.S. Department of Education to be formally included as a partner in planning and implementing the Study; the Department is already a member of the federal consortium that leads the Study, but was not named in the original legislation. The Act also requires that the National Children's Study comply with federal education law concerning the use of school records for research purposes.

December 9, 2006—The Prematurity Research Expansion and Education for Mothers who deliver Infants Early Act ("PREEMIE") passes, with provisions authorizing an Interagency Coordinating Council on Prematurity and Low Birthweight, and directing the U.S. Surgeon General to convene a meeting on preterm birth. The NICHD will assist the Surgeon General's Office in planning and holding the meeting in June 2008.

December 19, 2006—The Combating Autism Act becomes law, requiring the NIH and other federal agencies to expand their activities related to research on possible causes, diagnostics, and treatments for autism spectrum disorders. The Act also requires the NIH to develop and update an annual strategic plan for autism-related research, expand the Autism Centers of Excellence, and reauthorize the Interagency Autism Coordinating Committee.

September 27, 2007—Best Pharmaceuticals for Children/Pediatric Devices Act becomes law as part of the Food and Drug Administration Amendments Act of 2007. The Act reauthorizes the Best Pharmaceuticals for Children Act, extending additional patent exclusivity for drugs that are being tested for pediatric use, and makes improvements to the research program being supported by NICHD. The Act establishes a new program, for Pediatric Medical Device Safety and Improvement, requiring NIH to collaborate with the FDA and the Agency for Healthcare Research and Quality to develop a research plan for expanding medical device research and development focused on devices for children. NICHD is leading the trans-NIH effort to develop the research plan for studies of pediatric medical devices.

December 21, 2007—The President signs the bill renaming the NICHD as the "Eunice Kennedy Shriver National Institute of Child Health and Human Development."

The bill and renaming honors Mrs. Shriver's work in both supporting the establishment of the Institute and her ongoing efforts on behalf of the intellectually disabled and lauds the NICHD's research efforts in reducing SIDS, maternal HIV transmission, and development of vaccines, among others.

April 24, 2008—The Newborn Screening Saves Lives Act (P.L. 110-204) renames the NICHD's program as the *Hunter Kelly Newborn Screening Research Program* after the son of National Football League Pro Football Hall-of-Fame quarterback Jim Kelly and his wife Jill; Hunter Kelly had Krabbe disease, one of the classic leukodystrophies (a rare, degenerative, fatal muscular and nervous-system disease), and died at age eight in 2005. The Act also authorizes the NIH, through the NICHD, to develop systematic methods for identifying additional conditions for newborn screening, develop and test innovative treatments and strategies to improve outcomes, educate providers about newborn screening, create and implement communication systems for newborn screening, and sponsor research and research training programs.

April 28, 2008—The Traumatic Brain Injury (TBI) Act (P.L. 110-206) becomes law, reauthorizing funding for TBI research, treatment, surveillance, and education activities through 2012 at the NIH, CDC, and HRSA. Among its provisions, the Act requires a report to Congress on activities that can improve the collection and dissemination of epidemiological studies on the incidence and prevalence of TBI in persons formerly in the military and charges the NIH and CDC to conduct studies identifying common therapeutic interventions for TBI rehabilitation and those that can prevent secondary neurologic conditions, and to develop practice guidelines for the rehabilitation of TBI.

October 8, 2008—The Paul D. Wellstone Muscular Dystrophy Community Assistance, Research and Education (MD-CARE) Amendments of 2008 (P.L. 110-361) become law. The Act names the muscular dystrophy centers of excellence (several of which are funded by NICHD) as the Paul D. Wellstone Muscular Dystrophy Cooperative Research Centers. In addition, the Muscular Dystrophy Interagency Coordinating Committee, on which the NICHD Director sits, is authorized to give special consideration to enhance the clinical research infrastructure to test emerging therapies for the various forms of muscular dystrophy. The same day, Congress signs the Prenatally and Postnatally Diagnosed Conditions Act (P.L. 110-374) to increase the provision of information, referrals, and support services to families of patients who receive a diagnosis of Down syndrome or other prenatally or postnatally (up to one year after birth) diagnosed conditions. The Act also requires HHS to support coordination of "up-to-date and evidence-based" information regarding such services.

March 30, 2009—The President signs the Omnibus Public Land Management Act of 2009 (P.L. 111-11), which includes the Christopher and Dana Reeve Paralysis Act authorizing the NIH to coordinate paralysis research and rehabilitation activities across the Institutes, to establish research consortia and name them for Christopher and Dana Reeve, and to award grants for multicenter networks of clinical sites that will collaborate to design clinical rehabilitation intervention protocols and measures of outcomes on one or more forms of paralysis.

July 9, 2012—The President signs the Food and Drug Administration Safety and Innovation Act (P.L. 112-144). Among its provisions, the Act extends the Best Pharmaceuticals for Children Act (BPCA) and the Pediatric Research Equity Act (PREA) until 2017. The Act also establishes measures to improve both the BPCA and PREA in terms of their ability to encourage and support pediatric research.

BIOGRAPHICAL SKETCH OF NICHD DIRECTOR ALAN E. GUTTMACHER, M.D.

Alan E. Guttmacher, M.D., assumed the duties of NICHD Acting Director on December 1, 2009, and was appointed as the NICHD Director on July 22, 2010. A pediatrician and medical geneticist, Dr. Guttmacher came to the NIH in 1999 to work at the National Human Genome Research Institute (NHGRI), where he has served in a number of roles, including Deputy Director since 2002, and Acting Director from 2008 to November 30, 2009. In those roles, he oversaw that Institute's efforts to advance genome research, integrate that research into health care, and explore the ethical, legal, and social implications of human genomics.

Born in Baltimore, Maryland, Dr. Guttmacher explains that he went into medicine because, as a middle school teacher, he became interested in the etiology and treatment of pediatric learning disorders. He received an A.B. degree from Harvard College in 1972 and an M.D. from Harvard Medical School in 1981. After completing his internship and residency in pediatrics at Children's Hospital Boston, Dr. Guttmacher earned a two-year National Research Service Award from the U.S. Public Health Service as a fellow in medical genetics at Children's Hospital Boston and Harvard Medical School.

Dr. Guttmacher became director of the Vermont Regional Genetics Center at the University of Vermont College of Medicine in 1987. While there, he launched a series of public health genetics programs, directed the Vermont Cancer Center's Familial Cancer Program and the Vermont Newborn Screening Program, and founded Vermont's only pediatric intensive care unit. He also directed the nation's first statewide effort to involve the general public in discussion of the Human Genome Project's (HGP) ethical, legal, and social implications—an initiative funded by NIH. He also developed a busy practice in clinical genetics, conducted research, and was a tenured associate professor of pediatrics and medicine at the University of Vermont.

In 1999, he joined the NHGRI as Senior Clinical Advisor to the Director. In that role, Dr. Guttmacher established a dialogue with health professionals and the public about the health and societal implications of the HGP. He played a pivotal role in guiding the establishment of the National Coalition for Health professional Education in Genetics, a non-profit coalition that promotes health-professional education and access to information about advances in human genetics. He has given hundreds of talks to physicians, consumer groups, students and the lay public about genetics and its impact on health, health care and society. Among his research interests have been dysmorphology, syndrome identification and delineation, and hereditary hemorrhagic telangiectasia.

Dr. Guttmacher became Deputy Director of NHGRI in 2002. In 2003, he and Dr. Francis Collins (now NIH Director) co-edited *Genomic Medicine*, a series about the application of advances in genomics to medical care for *The New England Journal of Medicine*. He will be co-editing another series on genomics in medicine that will appear in the same journal starting in 2010. Dr. Guttmacher also oversaw the NIH's involvement in the U.S. Surgeon General's Family History Initiative, an effort to encourage all Americans to learn about and use their families' health histories to promote personal health and prevent disease. He previously served in volunteer leadership positions for several regional and national nonprofit organizations involved with reproductive health. He is a Fellow of the American Academy of Pediatrics, a Fellow of the American College of Medical Genetics, and a member of the Institute of Medicine.

DIRECTORS OF NICHD

Name	In Office from	To
Robert A. Aldrich	March 1, 1963	October 1964
Donald Harting	July 8, 1965	1966
Gerald D. LaVeck	October 9, 1966	September 1, 1973
Gilbert L. Woodside (Acting)	September 1, 1973	September 1, 1974
Norman Kretchmer	September 1, 1974	September 30, 1981
Betty H. Pickett (Acting)	September 30, 1981	June 30, 1982
Mortimer B. Lipsett	July 1, 1982	January 7, 1985
Duane Alexander	February 5, 1986	September 30, 2009
Susan Shurin (Acting)	October 1, 2009	November 30, 2009
Alan Guttmacher (Acting)	December 1, 2009	July 21, 2010
Alan Guttmacher	July 22, 2010	Present

PROGRAMS

In 2012, as the NICHD marked its 50th anniversary, the Institute made a number of changes to its organizational structure to streamline activities and accelerate the exchange of scientific ideas. The reorganization was informed by an extensive scientific Vision process, in which more than 700 leaders from the scientific, research, patient, and consumer communities, along with NICHD staff, identified major scientific opportunities in the next decade across the Institute's mission.

Under this reorganization, the Institute phased out the Center for Population Research, Center for Research for Mothers and Children, and Center for Developmental Biology and Perinatal Medicine and created a single Division of Extramural Research. The new Division includes the 12 existing scientific Branches and two new scientific Branches, as well as other organization units related to extramural research activities. The Associate Director for Extramural Research—a newly established leadership position within the NICHD—leads the Division.

Components of the Division of Extramural Research include:

- Child Development and Behavior Branch (CDBB)
- Contraceptive Discovery and Development Branch (CDDB)
- Developmental Biology and Structural Variation Branch (DBSVB)
- Fertility and Infertility (FI) Branch
- Grants Management Branch (GMB)
- Gynecologic Health and Disease Branch (GHDB)
- Intellectual and Developmental Disabilities Branch (IDDB)
- Maternal and Pediatric Infectious Disease Branch (MPIDB)
- Obstetric and Pediatric Pharmacology and Therapeutics Branch (OPPTB)
- Office of Committee Management (OCM)
- Office of Extramural Policy (OEP)
- Pediatric Growth and Nutrition Branch (PGNB)
- Pediatric Trauma and Critical Illness Branch (PTCIB)
- Population Dynamics Branch (PDB)
- Pregnancy and Perinatology Branch (PPB)
- Scientific Review Branch (SRB)

The reorganization maintained the National Center for Medical Rehabilitation Research, an extramural entity established by Congress within the NICHD in 1991. Components of the Center include:

- Behavioral Sciences and Rehabilitative Technologies (BSRT)Program
- Biological Sciences and Career Development (BSCD) Program
- Spinal Cord and Musculoskeletal Disorders and Assistive Technology (SMAD) Program
- Traumatic Brain Injury (TBI) and Stroke Rehabilitation (TSR) Program

The NICHD's intramural research program includes two Divisions that provide expertise ranging from biostatistics, epidemiology, computer sciences, and prevention research to biological and neurobiological, medical, and behavioral aspects of normal and abnormal human development. Components of these Divisions include:

- **Division of Epidemiology, Statistics and Prevention Research (DESPR)**
  - Office of the Director (OD)
  - Biostatistics and Bioinformatics Branch (BBB)
  - Epidemiology Branch (EB)
  - Prevention Research Branch (PRB)
- **Division of Intramural Research (DIR)**
  - Office of Scientific Director (OSD)
  - Cell Biology and Metabolism Program (CBMP)
  - Molecular Medicine Program (MMP)
  - Program in Cellular Regulation and Metabolism (PCRM)
  - Program in Developmental Endocrinology and Genetics (PDEGEN)
  - Program in Developmental Neuroscience (PDN)
  - Program in Genomics of Differentiation (PGD)
  - Program in Perinatal Research and Obstetrics (PPRO)
  - Program in Physical Biology (PPB)
  - Program in Reproductive and Adult Endocrinology (PRAE)
  - Program on Pediatric Imaging and Tissue Science (PPITS)

Visit http://www.nichd.nih.gov/about/org/Pages/index.aspx for a complete listing of the Institute's organizational units and descriptions of their missions and activities.

Scientific Vision

On December 5, 2012, the NICHD released the Scientific Vision: The Next Decade, the culmination of a collaborative process that began in 2011 to identify the most promising scientific opportunities for the Institute and the research community to pursue over the next decade. For information about the Vision process, discussions, and participants, visit http://www.nichd.nih.gov/vision. The scientific Vision provides a framework for research built upon the tenets described below.

Developmental Biology

Beginning at the cellular and molecular level, developmental biology is concerned with understanding such key processes as how embryos begin, form limbs and organs, and develop into mature organisms. The goal of this research area is to predict, identify and ameliorate the steps leading to birth defects and other variations in human structure and functioning. Advances in genomics—the study of the entire genome—offer new ways to study development and even to reprogram cells to develop new organs and tissues.

Developmental Origins of Health and Disease

Complex interactions between biological and environmental factors, starting before conception, influence development across the life span of the individual and future generations. Knowledge of these factors promises a future in which clinicians will be able to predict, and act to prevent, treat, or reverse disease.

Pregnancy and Pregnancy Outcomes

Millions throughout the world are at risk for such complications of pregnancy as gestational diabetes, hypertension, preterm birth, and stillbirth. To understand the problems that arise during pregnancy, research is needed, first, to understand the normal progression of a pregnancy.

Reproduction

Reproductive health depends on the ability to control fertility through a range of effective male and female contraceptive options and to access to effective assisted reproduction techniques when they are needed.

Behavior and Cognition

Behavioral factors can promote positive health outcomes or increase the risk of adverse ones. Cognition is a lifelong process that underlies human functioning. Improved understanding of behavior and cognition could ameliorate developmental conditions or help individuals interact with the world in ways that can sustain or improve their health and well-being.

Plasticity and Rehabilitation

Plasticity refers to the mechanisms underlying adaptive or maladaptive change to cells, organs, and tissues. Understanding plasticity is essential for understanding human development and rehabilitation. Once thought to occur only in early life, plasticity has now been shown to occur across the lifespan. The challenge is to build upon this understanding to improve functioning after injury, other forms of trauma, and disease.

Population Dynamics

Understanding how the forces that shape populations can influence health, together with understanding why some populations with similar genetic endowments and environmental exposures experience diverse health outcomes, can inform the development of effective population- and community-based interventions and can help identify factors that can eliminate health disparities.

Conduct of Science

The NICHD's scientific Visioning process identified many promising opportunities in all areas of biomedical research, and was not limited to the institute's mission. One avenue to success is increased transdisciplinary science—collaboration and cooperation among researchers in diverse fields. Another involves new approaches to utilizing the vast amount of scientific information that will result from complex long term studies and repositories housing lifetimes of biological specimens.

The scientific Vision will form the basis for an Institute-wide strategic planning process that will identify specific research directions and activities for the NICHD for the next 5 years.

For more information on the NICHD, its mission, its components, and its research, please visit http://www.nichd.nih.gov.

Appropriations: Grants and Direct Operations *(Amounts in thousands of dollars)*

Fiscal Year	Total Grants $	Direct Operations[1] $	Total $
1964	32,800	1,200	34,000
1965	38,906	3,790	42,695
1966	49,725	5,299	55,024
1967	55,710	9,212	64,922
1968	56,795	11,826	68,621
1969	57,363	15,763	73,126
1970	59,135	18,057	77,192
1971	64,151	30,609	94,760
1972	78,356	38,477	116,833
1973	89,114	41,315	130,429
1974	87,955	42,309	130,254
1975	97,848	44,587	142,435
1976	95,518	40,886	136,404
1977	100,717	44,826	145,543
1978	115,471	50,919	166,390
1979	143,951	54,039	197,630
1980	149,052	59,901	208,953
1981	164,233	56,395	220,628
1982	167,221	59,088	226,309
1983	188,948	65,376	254,324
1984	208,511	67,535	276,046
1985	236,547	76,211	312,758
1986	237,299	70,912	308,211
1987	281,413	85,238	366,651
1988	295,537	101,047	396,584
1989	318,567	106,701	425,628
1990	323,156	118,799	441,995
1991	351,031	127,916	478,947
1992	375,522	144,055	518,577
1993	380,059	147,708	527,767
1994	385,700	172,136	554,836
1995	397,494	172,815	570,309

1996	422,865	170,286	592,791
1997	454,374	176,991	631,365[2]
1998	486,527	185,565	672,092[3]
1999	551,845[4]	196,793	748,638[4]
2000	642,873	214,519	857,392
2001	738,441	237,140	975,581
2002	839,365	271,049	1,110,459
2003	892,243	313,684	1,205,927
2004	906,889	341,088	1,247,977
2005	903,027	359,263	1,262,290
2006	890,228	364,541	1,254,769
2007	898,923	355,221	1,254,144[5]
2008	898,000	361,439	1,259,439
2009	915,059	377,892	1,292,951[6]
2010	933,979	393,408	1,327,387[6]
2011	922,646	395,208	1,317,854
2012	930,956	389,195	1,320,1517[7]

[1] Includes R&D contracts, intramural research, and research management support.
[2] Excludes enacted administrative reduction of $338.
[3] Reflects 1% transfers by HHS and NIH noncomparable to fiscal year 2000.
[4] Updated since the 1999 NIH Almanac.
[5] Includes comparable adjustments for program transfers as reflected in the FY 2009 Congressional Justification.
[6] Excludes American Recovery and Reinvestment Act funds.
[7] Reflects 1% transfers by HHS and NIH.

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Recent Photos from the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD)

2012 PHOTOS

Sesame Street's Cookie Monster joined NIH Director Francis Collins, M.D., to introduce Rosemarie Truglio, Ph.D., Senior Vice President of Education and Research at Sesame Workshop and former NICHD Advisory Council member, at the reception following the 50th Anniversary scientific colloquium.
lo-res

Lynne Mofenson, M.D., Chief of the Maternal and Pediatric Infectious Disease Branch within the Division of Extramural Research, received the Federal Employee of the Year Award, one of of nine Samuel J. Heyman Service to America Medals bestowed by the Partnership for Public Service to public servants who make "high-impact contributions to the health, safety and well-being of Americans."
lo-res | hi-res

To commemorate its golden anniversary, the NICHD hosted a scientific colloquium featuring two Nobel Prize winners, the NIH and NICHD Directors, previous Institute leaders, and renowned scientists. Left to Right: Francis Collins, M.D., NIH Director; Yvonne Maddox, Ph.D., NICHD Deputy Director; Constantine Stratakis, M.D., D(Med)Sc, NICHD Scientific Director; Cathy Spong, M.D., NICHD Associate Director of Extramural Research; Alan Guttmacher, M.D., NICHD Director.

lo-res | hi-res

This page last reviewed on March 14, 2013

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MISSION

The National Institute on Deafness and Other Communication Disorders (NIDCD) conducts and supports research and research training on disorders of hearing and other communication processes, including diseases affecting hearing, balance, taste, smell, voice, speech, and language through:

- Research performed in its own laboratories and clinics
- A program of research grants, cooperative agreements, individual and institutional research training awards, career development awards, center grants, conference grants, and contracts to public and private research institutions and organizations
- Cooperation and collaboration with professional, academic, commercial, voluntary, and philanthropic organizations concerned with research and training that is related to deafness and other communication disorders, disease prevention and health promotion, and the special biomedical and behavioral problems associated with people having communication impairments or disorders
- The support of efforts to create devices that substitute for lost and impaired sensory and communication functions
- Ongoing collection and dissemination of information to health professionals, patients, industry, and the public on research findings in these areas.

IMPORTANT EVENTS IN NIDCD HISTORY

October 28, 1988—Public Law 100-553 authorized the formation of the National Institute on Deafness and Other Communication Disorders.

April 1989—The NIDCD published and released its first National Strategic Research Plan (NSRP). The NSRP was developed by one hundred distinguished scientists and clinicians charged with writing both a three year and a long-range research plan for deafness and other communication disorders.

June 26, 1989—The NIDCD Advisory Board held its first meeting.

September 18, 1989—The Advisory Council of NIDCD convened for the first time.

February 11, 1990—James B. Snow, Jr., M.D., was appointed as the first Director of NIDCD.

September 21, 1990—The NIDCD established the Office of Administrative Branch, Financial Management Branch, Personnel Management Branch, and Program and Health Reports Branch.

December 5, 1990—The Division of Intramural Research established labs and branches within the division.

December 6, 1990—The Information Systems Branch was created.

April 4, 1991—The Board of Scientific Counselors of NIDCD held its first meeting.

November 19, 1991—The Deafness and Other Communication Disorders Interagency Coordinating Committee met for the first time.

December 29, 1991—David J. Lim, M.D., was appointed as Scientific Director.

May 8, 1992—NIDCD/American Academy of Otolaryngology—Head and Neck Surgery sponsored a live interactive satellite conference, "Warning! The Impact of Pollution on the Upper Alimentary and Respiratory Tracts," to inform scientists, physicians, and the public about health problems associated with pollution and identify areas of needed research.

August 21, 1992—NIDCD/Department of Veterans Affairs directors signed a Memorandum of Understanding that established a collaboration to expand and intensify

hearing aid research and development.

October 23, 1992—NIDCD/National Aeronautics and Space Administration (NASA) established a formal scientific collaboration to enhance basic knowledge and understanding of vestibular function in both clinical and normal states and provide investigators access to NASA's unique ground-based research facilities and to space flight.

March 1-3, 1993—Consensus Development Conference, "Early Identification of Hearing Impairment in Infants and Young Children," evaluated current research and provided recommendations regarding hearing assessment from birth through 5 years of age.

October 25, 1993—NIDCD commemorated its fifth anniversary, "A Celebration of Research in Human Communication."

January 18, 1994—The Division of Communication Sciences and Disorders established the Hearing and Balance/Vestibular Sciences Branch and the Voice, Speech, Language, Smell, and Taste Branch.

May 1994—The NIDCD Advisory Board held its final meeting.

August 5, 1994—The Division of Communication Sciences and Disorders was changed to the Division of Human Communication.

February 14, 1995—"The Partnership Program" began, designed to maximize opportunities for underrepresented students to participate in fundamental and clinical research in the NIDCD research areas, with 4 academic centers: Morehouse School of Medicine; University of Puerto Rico School of Medicine; University of Alaska System, Fairbanks; and Gallaudet University.

March 1, 1995—James F. Battey, Jr., M.D., Ph.D., was appointed as Director of the Division of Intramural Research.

May 15-17, 1995—Consensus Development Conference, "Cochlear Implants in Adults and Children," summarized current knowledge about the range of benefits and limitations of cochlear implantation.

September 11-13, 1995—First biennial conference, "Advancing Human Communication: An Interdisciplinary Forum on Hearing Aid Research and Development," was held.

September 4-5, 1997—The NIDCD Working Group on Early Identification of Hearing Impairment held its first workshop and made recommendations on acceptable protocols for use in state-wide Universal Newborn Hearing Screening Programs.

September 13, 1997—James B. Snow, Jr., M.D., retired as the first Director of NIDCD. James F. Battey, Jr., M.D., Ph.D., became Acting Director of NIDCD.

September 22-24, 1997—The second biennial hearing aid research and development conference took place.

February 10, 1998—James F. Battey, Jr., M.D., Ph.D., was appointed as the new Director of NIDCD.

March 13, 1998—The NIDCD Working Group on Early Identification of Hearing Impairment's second workshop identified research opportunities offered by neonatal hearing screening programs, specifically in diagnostic strategies for characterizing hearing impairment and in the intervention strategies for remediating hearing impairment.

August 13-14, 1998—The Working Group on Single and Multiple Project Grants held its first meeting.

December 8, 1998—The NIDCD Working Group for Developing and Implementing Genetic Diagnostic Tests for Hereditary Hearing Impairment and Other Communication Disorders met and made recommendations for an organization of a consortium of investigators studying genes in communication disorders to permit the rapid pooling of information; support for laboratories, protocols, and carefully designed studies to address the issues of inclusion of individuals with hearing impairments and individuals who are deaf as well as related organizations representing the spectrum of involved communities of deaf or hearing-impaired people in the formulation and establishment of guidelines and future recommendations regarding genetic testing.

December 20, 1998—Robert J. Wenthold, Ph.D., was appointed as Scientific Director.

January - February 1999—The NIDCD convened a group of distinguished scientists and members of the public to provide recommendations for a Strategic Plan.

May 25, 1999—The NIDCD Working Group on Communicating Informed Consent to Individuals Who Are Deaf or Hard-of-Hearing met to clarify issues of informed consent, develop guidelines for use by scientists, and propose new, needed materials for improving communication about informed consent.

June 21-22, 1999—The NIDCD and the Life Sciences Division of NASA co-sponsored a planning workshop "Role of Transgenic and Knockout Studies in Understanding Sensory-Motor Performance in Altered Gravitational Environments." Participants explored the viability of studying the effects of altered gravitational exposure on sensory-motor function in genetically altered experimental model systems.

2000—NIDCD created the Hearing Health Objectives to improve the hearing health of the Nation through prevention, early detection, treatment, and rehabilitation that were tracked in the joint Vision and Hearing Chapter of Healthy People 2010 initiative.

September 19, 2000—The third workshop of the NIDCD Working Group on Early Identification of Hearing Impairment identified critical research needs in the area of early identification of hearing impairment. The workshop was designed to provide advice to the NIDCD for identifying research to be supported through the Federal government grant and contract processes.

November 29-30, 2000—NIDCD sponsored a workshop titled "Otitis Media: New Approaches for Analysis, Treatment, and Prevention" to report on the state of the art of otitis media research and to make recommendations regarding potential new approaches for analysis, intervention, and prevention of otitis media.

December 11, 2000—NIDCD signed a Memorandum of Understanding with the Center for Comparative and Evolutionary Biology of Hearing, University of Maryland, College Park, to establish a program for training graduate students in the hearing sciences.

March 22-23, 2001—The Division of Intramural Research, NIDCD, held its first retreat at St. Michael's, Md.

May 24, 2001—Dr. Battey unveiled the Institute's new logo at the Advisory Council meeting.

July 23, 2001—"Communicating the Need for Follow-up to Improve Outcomes of Newborn Hearing Screenings: The third workshop of the NIDCD Working Group on Early Identification of Hearing Impairment" convened to examine and develop recommendations for health care professionals on communicating follow-up of infants who do not return for a re-examination after an initial assessment of hearing impairment has been made.

August 1, 2001—NIDCD Auditory/Stem Cell Workshop was held to discuss and identify potential areas of the auditory and vestibular systems that might be good candidates for applications being used in other reparative medicine systems, one being the potential use of stem cell biology.

March 19-20, 2002—NIDCD Workshop on Congenital Cytomegalovirus Infection (CMV) and Hearing Loss convened to present the current research in related fields of congenital CMV infection and hearing loss; to better determine the degree to which congenital CMV infection contributes to hearing loss in children; and to facilitate a discussion among experts in order to develop a set of recommendations for future research in the area of congenital CMV infection and hearing loss.

May 13, 2002—The NIDCD workshop, "The Role of Neuroimaging in the Study of Aphasia Recovery and Rehabilitation: Research Needs and Opportunities" was held to identify research opportunities for the application of neuroimaging methods to the study of aphasia recovery and rehabilitation; to identify and address particular methodological challenges of imaging research focusing on the issue of aphasia recovery and rehabilitation; and to develop strategies to encourage collaborative efforts among researchers with expertise in functional neuroimaging, language processing and aphasia rehabilitation.

August 22, 2002—Auditory/Vestibular Cell Lineage and Development Workshop met to discuss the present and future state of cell lineage and development research in the auditory and vestibular systems.

September 2002—Dr. Battey was appointed as Chair of the NIH Stem Cell Task Force by NIH Director Dr. Elias Zerhouni. In March 2007, Dr. Battey began serving as Vice Chair.

October 21, 2002—NIDCD hosted the first NIH lecture on health literacy, "Babel Babble: What Is the Doctor Saying? What Is the Patient Understanding?" for health communication professionals who develop health materials and communication strategies for a range of diverse audiences.

June 12, 2003—Dr. Battey opened the First NIH Symposium on Human Embryonic Stem Cells, Bethesda, Md.

September 12, 2003—NIDCD convened the "Human Temporal Bone Research Workshop: Laboratory and Training Support" to identify the funding issues and requirements involved in sustaining human temporal bone research laboratories and the training of qualified researchers in the United States; and to develop recommendations for action(s) NIDCD might take to address the identified issues and requirements.

December 2003—NIDCD's WISE EARS!® national campaign to prevent noise-induced hearing loss turned 5 years old. The campaign is a coordinated effort among NIDCD, the National Institute on Occupational Safety and Health (NIOSH), and a coalition of organizations who care about hearing.

April 27-28, 2004—NIDCD sponsored the workshop "Translational Research (TR) in Hearing and Balance" to discuss translational research as related to hearing and balance, identify barriers to and opportunities in translational research, and articulate activities that could be initiated by the NIDCD in order to increase the translation of scientific accomplishments from the laboratory to the research clinic and beyond to impact clinical practice and public health.

April 30-May 2, 2004—NIDCD and the NIH Office of Rare Diseases co-sponsored a workshop on "Universal Reporting Parameters for the Speech of Individuals with Cleft Palate" to further develop and refine the common approach in describing and reporting clinical speech outcomes of individuals born with cleft palate, regardless of the language spoken by the individual.

June 3-4, 2004—NIDCD sponsored the workshop “Electrical Stimulation of the Vestibular Nerve” to identify opportunities for the development of a neural prosthesis to electrically stimulate the portion of the eighth nerve which carries signals from the vestibular endorgan. Participants identified clinical populations that would benefit from studies with a device similar to the cochlear implant, but modified to address balance disorders.

October 2004—NIDCD-funded investigator Dr. Linda Buck won the 2004 Nobel Prize in Physiology or Medicine.

March 29-30, 2005—NIDCD sponsored a Workshop on Epidemiology of Communication Disorders to report on current epidemiologic knowledge in the field; suggest ways to encourage more epidemiologic research; describe the importance of population-based research studies for understanding the burden of communication disorders in society and recommend priority topics where more epidemiologic research would be valuable.

May 21-23, 2005—NIDCD held "State of the Science Conference: Developmental Stuttering" conference to enable the cross-disciplinary discussion that will help to focus NIDCD initiatives for stuttering research and treatment.

June 23-24, 2005—NIDCD co-sponsored the first Workshop on Spasmodic Dysphonia Research to develop a roadmap for SD research.

September 7, 2005—NIDCD held a workshop "Report of the Molecular Therapies for Auditory/Vestibular Disease" to discuss the current and future state of molecular

therapy development in auditory and vestibular disease. The purpose of the workshop was to discuss and identify research opportunities that will advance/translate targeted molecular approaches into clinical treatments.

October 2005—NIDCD sponsored a Clinical Research Workshop to invigorate the clinical research in the NIDCD portfolio.

December 5-6, 2005—The NIDCD Tinnitus Research Workshop was held to bring together key people currently doing clinical and basic research in central mechanisms and treatments in tinnitus and others who are outside the field of tinnitus research, but who do work that might be relevant to the field.

May 26-27, 2006—NIDCD and the NIH Office of Rare Diseases sponsored a workshop to evaluate the potential for brain-computer interfaces (BCI) to provide a means for speech synthesis and control of other forms of assistive technology that support communication in patients who are locked-in.

October 19-20, 2006—NIDCD co-sponsored a workshop, titled "Noise-Induced Hearing Loss in Children at Work and Play," in Covington, Ky. The workshop convened researchers, hearing health professionals, teachers, and advocacy groups and focused on the prevention of noise-induced hearing loss.

December 12-13, 2006—NIDCD/NIH sponsored a workshop on "Outcomes Research in Children with Hearing Loss" to determine and prioritize research needs and discuss design considerations unique to outcomes research in children with hearing loss.

May 9-10, 2007—NIDCD sponsored a workshop "Clinical Research/Clinical Trials in Otology: Setting the Research Agenda for Development of an Intervention" to bring together leaders in otology and clinical trials to focus on what it would take to develop interventions in otology. The goal was to encourage cross and multidisciplinary science towards the development or establishment of evidence-based treatments for otologic conditions/disorders, and to determine, on the basis of available data regarding epidemiology and stage of science, a prioritization of otologic conditions for which intervention-oriented research may be ready.

May 6, 2008—Dr. Battey provided closing remarks at the NIH stem cell symposium, "Challenges & Promises of Cell-Based Therapies."

July 22-23, 2008—NIDCD Workshop on Immune Mediated Ear Disease/Hearing Loss met to obtain updates on the current status of immune mediated ear disease research; to identify research gaps; and to get expert recommendations regarding research needs that will aid our understanding of this complex form of hearing loss and ultimately lead to diagnostics and therapies that preserve natural hearing.

September 23, 2008—The NIDCD Workshop on Exploring International Collaborative Research in Deafness & Other Communication Disorders met to explore international collaborative research and to stress the need to educate researchers and reviewers about the opportunities for scientific discovery through international collaborative research.

October 2008—NIDCD launched a new health education campaign called *It's a Noisy Planet. Protect Their Hearing***.** The Noisy Planet campaign is designed to increase awareness among parents of children ages 8 to 12 ("tweens") about the causes and prevention of NIHL. View Image.

October 23, 2008—NIDCD celebrated two decades of research accomplishments with a one day symposium. The symposium included three scientific sessions representing NIDCD's primary areas of research: hearing and balance; taste and smell; and voice, speech, and language. View Image.

August 13-14, 2009—NIDCD Workshop on Tinnitus met to evaluate central nervous system mechanisms of tinnitus in civilian, military and veteran populations and to stimulate to stimulate development of new neural prostheses and other treatments for chronic severe tinnitus.

April 1, 2009—Andrew Griffith, M.D., Ph.D., was appointed as the Director of the Division of Intramural Research.

August 25-27, 2009—NIDCD sponsored a working group on *Accessible and Affordable Hearing Health Care for Adults with Mild to Moderate Hearing Loss* to develop a research agenda to increase accessibility and affordability of hearing health care for adults, including accessible and low cost hearing aids.

2010—NIDCD expanded the Hearing Health Objectives of HP 2010 to include all mission areas of NIDCD. The new chapter in HP 2020 is now called "Hearing and Associated Sensory or Communication Disorders."

April 13-14, 2010—NIDCD sponsored a workshop on Nonverbal School-Aged Children with Autism to address clinical needs and research opportunities regarding this population.

May 10, 2010—NIDCD held its first Robert J. Wenthold Memorial Lecture, to be sponsored each year in honor of NIDCD's longtime scientific director.

August 18, 2010—The NIDCD P30 Engineering Cores Workshop met at the NIH to compare how the different P30 Core Centers develop software and hardware improvements to their resources, and how to facilitate sharing such developments.

September 13, 2010—The NIDCD P30 Imaging Cores Workshop met at the NIH to consider technological developments in biological microscopy, data capture and analysis of digital images, and how the different Core Centers can adapt and share useful advances.

June 14, 2011—The NIDCD P30 Human Subjects Cores Workshop met at the NIH to discuss improving and sharing strategies and resources for recruitment, diversity, data management, and regulatory compliance across the Core Centers.

2011—NIDCD redesigned its Strategic Plan for Research, including switching from a 3-year plan to a 5-year plan, and holding workshops with experts in each mission area (Hearing and Balance, Taste and Smell, and Voice, Speech, and Language) to identify areas of emerging opportunity. The new Plan includes expanded efforts to translate research discoveries into clinical practice. NIDCD posted the revised 2012-2016 Strategic Plan on the NIDCD website in February 2012.

September 14, 2011—NIDCD sponsored a workshop on Regenerative Therapies to address future needs and research opportunities regarding restoration therapies for

hearing and balance deficiencies.

November 7, 2011—NIDCD sponsored a workshop, "NIDCD Workshop for New Clinician-Investigators in Communication Disorders: Strategies for Success," for its cadre of Mentored Clinician-Scientist Career Development (K08/K23) awardees. The purpose of this forum was to orient NIDCD's K08 and K23 awardees to the NIH grant submission and peer review process, and to guide them in competing successfully for their Early-Stage Investigator R01 award and in building their research programs.

April 2012—NIDCD co-sponsored a working group on Collaboration and Consolidation of Databases for Research in Hearing Health Care.

June 14, 2012—The NIDCD Workshop on Motion Perception and Balance Disorders met at the NIH to discuss mechanisms of human motion perception and misperceptions that lead to spatial discomfort and disorientation and disorders of balance, and how new approaches could improve clinical management of balance disorders.

August 29, 2012—NIDCD sponsored a workshop, "Moving the NIDCD Research Training Program Forward in Fiscally Constrained Times," to guide the future management of the Institute's Individual and Institutional Ruth L. Kirschtein National Research Service Award enterprise.

NIDCD LEGISLATIVE CHRONOLOGY

October 28, 1988—Public Law 100-553 authorized the formation of the National Institute on Deafness and Other Communication Disorders.

February 15, 1989—Section 406 of the Public Health Service Act, Public Law 92-463, NDCD Advisory Council was established to advise the Secretary of the U.S. Department of Health and Human Services (HHS); the NIH Director; and the Director of NIDCD on matters relating to the conduct and support of research and research training, health information dissemination, and other programs with respect to disorders of hearing and other communication processes.

January 25, 1991—Section 402(b)(6) of the Public Health Service Act, Public Law 92-463, NIDCD Board of Scientific Counselors advises the Director, Division of Intramural Research, NIDCD, on the quality of the intramural research programs and the research of tenured and tenure-tracked scientists of the Division, through periodic reviews.

March 1, 1991—Public Law 100-553 Section 464(b), The NIDCD Information Clearinghouse was established to facilitate and enhance, through the effective dissemination of information, knowledge and understanding of disorders of hearing and other communication processes.

November 29, 1999—Public Law 106-113. As a part of the Consolidated Appropriations Act for Fiscal Year 2000, the Newborn Infant Hearing Screening and Intervention Act of 1999 was signed into law by President Bill Clinton. The legislation authorized three years of funding to the Health Resources and Services Administration (HRSA), the Centers for Disease Control and Prevention (CDC), and the NIDCD to aid in the development of newborn infant hearing screening programs.

December 22, 2010—Public Law 111-337. The Early Hearing Detection and Intervention Act of 2010 was signed into law by President Barack Obama. The bill reauthorized Public Law 106-113 for Fiscal Years 2011-2015 and expands the program to include diagnostic services among the services provided to newborns and infants.

BIOGRAPHICAL SKETCH OF NIDCD DIRECTOR JAMES F. BATTEY, JR., M.D., PH.D.

Dr. Battey became the new NIDCD director on February 10, 1998. He served as acting director since the retirement of the Institute's first director in September 1997. He is responsible for the planning, implementation, and evaluation of Institute programs to conduct and support biomedical and behavioral research, research training, and public health information in human communication.

He received his education at the California Institute of Technology, where he earned his B.S. with honors in physics. He earned his M.D. and Ph.D. in biophysics at Stanford University, where he had residency training in pediatrics. His postdoctoral fellowship at Harvard Medical School was under the direction of the eminent scientist Dr. Philip Leder. While working with Dr. Leder, Dr. Battey was part of a team that cloned the genes encoding the IgE immunoglobulin constant region domains. In addition, he isolated and characterized the human c-myc gene, a key growth regulatory nuclear proto-oncogene that contributes to cancer formation when inappropriately expressed.

Dr. Battey has been with NIH since 1983, first on the staff of the National Cancer Institute (NCI), where he rose from senior staff fellow to senior investigator. In his work at the NCI-Navy Medical Oncology Branch, he collaborated in the isolation and characterization of human N-myc and L-myc, two additional members of the human myc gene family, important in human neoplasms. He became interested in neuropeptides and their receptors at this time because of their dual function as growth factors and regulatory peptides. His group isolated cDNA and genomic clones for mammalian bombesin-like peptides, key regulators of secretion, growth and neuronal firing.

In 1988 he moved to the National Institute of Neurological Disorders and Stroke as chief of the molecular neuroscience section in the Laboratory of Neurochemistry. In 1992 he returned to the NCI to head the molecular structure section of the Laboratory of Biological Chemistry, where his laboratory cloned and characterized the genes for 3 subtypes of mammalian receptors for bombesin-like peptides. His team at NCI's Laboratory of Biological Chemistry was among the first to clone the gene encoding cdk5, a member of the cyclin-dependent kinase family, where important proteins are involved in cell cycle control. Dr. Battey was appointed as director of the Intramural Research Program for NIDCD in 1995 by Dr. Snow, the first NIDCD director. The PHS has honored him with its PHS Commendation Medal in 1990 and the Outstanding Service Medal in 1994. He is author or co-author of over 130 research articles and is co-author with Leonard Davis and Michael Kuehl of *Basic Methods in Molecular Biology*.

NIDCD DIRECTORS

Name	In Office from	To
Jay Moskowitz (Acting)	October 31, 1988	February 10, 1990
James B. Snow, Jr.	February 11,1990	September 15, 1997
James F. Battey, Jr.	September 14, 1997	Present

RESEARCH PROGRAMS

NIDCD supports and conducts research and research training in the normal and disordered processes of hearing, balance, smell, taste, voice, speech, and language through a program of grants and contracts in basic, clinical, and translational research. They are conducted in public and private institutions across the country and around the world and within the laboratories and clinics at the National Institutes of Health in Bethesda, Md.

The *Division of Intramural Research* conducts basic and clinical research in human communication disorders. Research objectives include: studies of electromechanical processes responsible for fine tuning in the cochlea; identification, characterization, and cloning of genes responsible for hereditary hearing impairment; electromotility of the outer hair cell; molecular bases of mechanosensory transduction mechanisms in the organ of Corti; molecular bases for G-protein signaling with emphasis on sensory signaling processes in the chemical senses; development of vaccines for otitis media; molecular mechanisms underlying the development and function of the mammalian taste system; mechanisms responsible for the development of the inner ear; molecular mechanisms underlying auditory system function with emphasis on neurotransmission and neuromodulation; identification of genes associated with neoplasms affecting human communication; identification of the genetic component of stuttering; neuroimaging of brain function in physiologic and pathophysiologic states; pathophysiology and etiology of voice and speech disorders; and epidemiological and biometric research studies of communication disorders.

The *Division of Extramural Activities* provides leadership and advice in developing, implementing, and coordinating extramural programs and policies. It represents the Institute on NIH committees on extramural program policies and oversees compliance with such policies within the NIDCD. The Division provides grant management and processing services for all of the Institute's grants and conducts initial scientific merit review of a large array of grant mechanisms. In addition, the Division coordinates the Institute's committee management activities, research integrity activities, and Certificates of Confidentiality, and manages the meetings of the National Deafness and Other Communication Disorders Advisory Council. The Division has 2 components: Grants Management Branch and Scientific Review Branch.

- Grants Management Branch (GMB)—focal point for all business-related activities associated with the negotiation, award, and administration of grants and cooperative agreements within the NIDCD. GMB plays a critical role of bridging among the various NIH offices (review, program, financial management, and policy), institutional offices of sponsored programs, and principal investigators.
- *Scientific Review Branch (SRB)*—coordinates the initial scientific peer review of applications for the following mechanisms of support: research project grants, clinical center and core center grants, research training and career development grants, clinical trials, conference grants, and cooperative agreements. SRB also coordinates receipt and referral issues with the Center for Scientific Review, represents NIDCD on trans-NIH committees, as well as NIH's overall committee for review policies, and manages all aspects of NIDCD's peer review process.

The *Division of Scientific Programs* of NIDCD is responsible for coordinating a broad range of activities and functions to ensure sound and efficient management of NIDCD's extramural research including research grants, career development awards, individual and institutional research training awards, center grants, and contracts to public and private research institutions and organizations. The division provides leadership and advice in developing, implementing, and coordinating extramural programs and policies. It represents the Institute on NIH committees on extramural program policies and oversees compliance with such policies within the NIDCD. The division is responsible for the development and implementation of scientific initiatives based on scientific portfolio assessment. The division plans and directs grant and contract support for research and research training in the normal processes and diseases and disorders of hearing, balance, taste, smell, voice, speech, and language. The division works to insure maximum utilization of available resources in attainment of the Institute's objectives; assesses needs for research and research training in program areas; establishes program priorities and recommends funding levels for programs to be supported by grants; and works to facilitate new research directions and the development of new investigators.

Hearing

Decades of cellular and molecular approaches have identified numerous genes and proteins important to hearing function. A multitude of genes for syndromic and nonsyndromic forms of hearing impairment including autosomal dominant and recessive, X-linked and mitochondrial modes of transmission have been located in specific regions of the human genome. In addition, clinically relevant genes essential for normal auditory development and/or function have been identified and cloned at a rapid pace. Other cochlear-specific genes have been isolated from enriched membranous labyrinth cDNA libraries. Development of detailed maps using numerous approaches, including expressed sequence tags (EST) coupled with the use of inner ear specific cDNA libraries, exon trapping, and cDNA library enrichment procedures, have facilitated gene cloning.

The use of mouse models of hereditary hearing impairment have been instrumental in mapping and cloning many deafness genes. Because of the utility of the mouse for such studies, additional mouse models of deafness are being created through mutagenesis and screening programs as well as targeted mutation of deafness genes found in man. In addition, mouse models are being used to study the function of the proteins encoded by deafness genes and to test therapeutic approaches. These advances offer researchers many opportunities to study the characteristics of deafness, hereditary factors involved in hearing loss, and genes that are critical for the development and maintenance of the human ear. Great strides are being made in the study of properties of auditory sensory cells and of characteristics of the inner ear's response to sound.

Other less obvious model systems have also proven invaluable to hearing technology. With the difficulty to hear conversations in the midst of a crowded, noisy room using current hearing aids, NIDCD-supported researchers have continued to work towards revolutionizing the technology of directional microphones. The technology is

based on the ears of a parasitic fly, *Ormia ochracea*. Despite the small size of the insect's ears and the short distance between them, *Ormia's* ears are able to rapidly pinpoint the location from which the sound of a potential host—a cricket—is coming, even in a noisy environment. The intriguing mechanism that enables *Ormia* to accomplish this feat has provided a model for scientists and engineers to use in developing miniature directional microphones for hearing aids that can better focus on speech in a single conversation, even when surrounded by other voices.

A randomized, double-blinded phase III clinical trial concluded recently that intratympanic steriod injections given across the eardrum into the middle and inner ear were not inferior to traditional oral steriod therapy in treating sudden sensorineural hearing loss. Side effects and risks were minimal. This clinical trial supports alternative treatment for patients with medical conditions, such as high blood pressure and diabetes, that might not tolerate oral steroid therapy well.

Scientific advances have also been translated into cochlear implants. Research has verified that despite the variability in the performance of children who have received cochlear implants, most demonstrate marked improvements in speech perception and production. Cochlear implants also positively influence children's receptive and expressive language skills. The earlier children are implanted and the longer children use their implants, the greater their language ability. To achieve the most benefit from their implants, however, children generally need extensive oral-auditory training following implantation and also benefit from periodic audiological assessments. Cochlear implants have benefited children who are congenitally deaf as well as those who are postlingually deaf. The vast majority of adult implant recipients derive substantial benefit in conjunction with speechreading, and most can communicate effectively by telephone. Clinical treatment paradigms are continually advancing and now include simultaneously implanting bilateral (both ears) cochlear implants in pediatric and adult populations. Most recently, a new shortened electrode is being studied, with hopes of improving the ability of cochlear implant recipients to understand speech in noise. This electrode, which makes use of still-functioning sensory cells in the inner ear combined with an electronic speech processor, may also allow some hearing aid users who are not benefiting from their hearing aids to become cochlear implant candidates.

Neural prosthesis development efforts are continuing to seek improved device design elements and novel algorithms for operation. These activities are primarily based on animal studies that allow new concepts for selective stimulation of neural tissue to be tested quantitatively and any risks for safe operation identified through both neurophysiologic and histologic studies. Microstimulation delivered through electrodes that penetrate the neural tissue and infrared optical stimulation are two examples of novel device elements currently under development. Other research projects are assessing novel signal processing and stimulation algorithms which could be provided to the current generation cochlear implant recipients, if they are proven to extend user performance limits.

It is estimated that about 25 million Americans experience tinnitus each year that lasts 5 minutes or longer. Of these, about 12 million have tinnitus severe enough to seek medical attention. Many learn to ignore the sounds and experience no major effects. However, about 2 million patients are so seriously debilitated that they cannot function normally, finding it difficult to hear, work, or sleep. For many years, it was believed that structures in the inner ear produced tinnitus, but more recent evidence suggests that for most people, tinnitus is generated in the central nervous system following damage to the inner ear that results in a permanent hearing loss. The FDA-cleared Neuromonics Tinnitus Treatment is intended to provide a relief from the disturbance of tinnitus by providing sounds that are specifically adapted to tinnitus experienced by the patient as a part of a tinnitus management program. Although research is providing more evidence for the causes of tinnitus, advances in the basic research for understanding the biological bases of tinnitus are needed.

Valuable progress has been made in understanding the structure and function of efferent feedback pathways to the inner and middle ear. There is now evidence that this system may aid in the detection of signals in noisy environments and serve to protect the ear from acoustic injury.

Our knowledge of the mechanisms of neural plasticity (the ability of the brain to change or adapt) has increased tremendously over the past decade. In contrast, our knowledge of the mechanisms that regulate and instruct plasticity remains primitive. The calibration of the auditory system's map of space by the visual system is a well-characterized example of supervised learning. In an animal model, the site in the auditory pathway where visual signals exert their effects, and the structural and functional changes they cause, have been determined. However, the properties of the instructive signals themselves, and the mechanisms by which they exert their effects, remain unknown. Research is ongoing to understand these mysteries, which will allow us to better understand learning and learning problems.

In the aging auditory system, discoveries have been made demonstrating changes in the regulation of fluid composition and autoregulation of cochlear blood flow which may underlie some of the biologic effects of aging on auditory function. The role of the stria vascularis in maintaining cochlear homoestasis has now been shown to be a component in the loss in hearing accompanying aging. Improved behavioral and electrophysiological techniques for measuring auditory function are providing more accurate assessments of the peripheral and central components of age-related hearing impairment.

Recent development of animal models for bacterial and viral infections hold promise for new diagnostic and therapeutic approaches to sensorineural hearing loss caused by infections. Antiviral drugs may find rapid application in the treatment for these conditions with the advent of suitable animal models in which to test efficacy. In addition, models will allow a greater understanding of why and to what degree infants and children are susceptible to ototoxic drugs used in the treatment of infections.

Otitis media continues to be a significant focus of research because of its prevalence and cost to society. Important risk factors have been identified. Studies of the eustachian tubes have provided new information on tubal mechanics, surfactant-like (fluid) substances and middle ear pressure regulation. The role of bacterial biofilms in chronic otitis media is a new and promising area of investigation. State-of-the-art molecular, genetic and genomic techniques are being used to identify genes that may predispose an individual to chronic otitis media. These techniques are also being used to define the specific molecular changes that allow viral and bacterial infection of the middle ear as well as the host/pathogen interactions that facilitate the disease process. The EarPopper (developed with support from the Small-Business Innovation Research Program) is a safe, simple, non-surgical, non-drug related prescription device for treating such common conditions as otitis media with effusion, aerotitis/barotitis (caused by rapid elevation changes), and eustachian tube dysfunction in children and adults.

Balance

NIDCD supports research on balance and the vestibular system. Balance disorders affect a large proportion of the population, particularly the elderly. The vestibular system, with its receptor organs located in the inner ear, plays an important role in the control of balance while the body is immobile and in motion, the maintenance of one's orientation in space, and visual fixation of objects during head movement. Vestibular disorders can therefore yield symptoms of imbalance, vertigo (the illusion of motion), disorientation, instability, falling, and visual blurring (particularly during motion). Deficits in vestibular function result from diverse

disease processes, including infection, trauma, toxicity, impaired blood supply, autoimmune disease, impaired metabolic function, and tumors.

The cellular motion detectors of the vestibular system are mechanosensory hair cells, activated by movements of fluids and masses in the inner ear. New technologies are being used with NIDCD support to visualize and understand the micromechanical motions and the biophysical mechanisms that lead to the neural signals carried from the inner ear to the brain.

Investigators supported by the NIDCD also use molecular and biochemical approaches to characterize cellular biochemical pathways essential to normal development and function in the vestibular system. The genetic bases of several human-inherited cerebellar syndromes of imbalance and incoordination are currently being investigated.

NIDCD-supported studies suggest that, in addition to its role in the stabilization of gaze and balance, the vestibular system plays an important role in regulating respiratory muscles as well as autonomic functions, including blood pressure. These studies hold potential clinical relevance for the understanding of certain kinds of breathing problems, and management of orthostatic hypotension (lowered blood pressure related to a change in body posture).

The Institute supports research to develop and refine tests of balance and vestibular function. Computer-controlled systems have been developed and validated for clinical use to measure eye movement and body postural responses activated by stimulating specific parts of the vestibular sense organ and nerve. Also, tests of functional disability and physical rehabilitative strategies currently being applied in clinical and research settings will have important implications for refining the rehabilitation of patients with balance and vestibular disorders.

For the first time, a prosthesis for balance disorders has been implanted in a human. In the United States, more than 150,000 individuals are estimated to suffer from severe to profound bilateral vestibular deficiency, and a prosthesis of this type potentially could help many of these people, as well as patients with disabling episodes of vestibular dysfunction such as from Ménière's disease. NIDCD funding helped support development of the device and preclinical animal testing for its use in the treatment of balance disorders.

Taste and Smell

NIDCD investigators study the chemical senses of olfaction (smell) and gustation (taste) to enhance our understanding of how individuals sense their environment and make discriminating food choices. A taste or smell problem may seem like a relatively minor health issue to some; however, these disorders can have a major impact on a person's quality of life, food preferences, diet, and overall health. Taste and smell problems are often associated with high-priority health risks, such as poor nutrition, adult-onset diabetes, obesity, and cardiovascular disease. In addition, a decline in the sense of smell may serve as an indicator of future cognitive problems such as Alzheimer's disease or Parkinson's disease. The NIDCD supports research to study the prevalance of taste and smell dysfunction and associated health risks.

Advances in molecular and cellular biology, biophysics, and biochemistry of the olfactory and gustatory systems are paving the way for improved diagnosis, prevention, and treatment of chemosensory disorders. NIDCD scientists are presently characterizing the receptor, signal transduction pathways, and neurotransmitters used by olfactory and taste sensory receptor cells. These studies are being conducted using a range of model systems from invertebrates to humans and hold promise of broad public health relevance. For example, NIDCD-funded researchers are studying the chemosensory receptors of insects, which transmit a wide variety of diseases (e.g., malaria, dengue fever, and yellow fever) and locate their human hosts primarily through smell and taste. Advances in understanding insect chemosensation and host-seeking behavior will offer new strategies for pest control and the prevention of insect-borne diseases.

NIDCD researchers are also studying how taste substances bind to their targeted receptors. The goal is to facilitate the rational design of artificial sweeteners and salt substitutes to combat obesity as well as hypertension, which is strongly associated with the overconsumption of dietary salt. Such receptor binding studies will also facilitate the development of compounds that block the bitterness of some foods and medicines. The development of "bitter blockers" is especially important because the bitterness of many pediatric and antiviral HIV/AIDS medications can hinder treatment compliance.

The olfactory and gustatory systems are model systems for studying the fundamental mechanisms of neural plasticity. NIDCD scientists have found that taste and olfactory receptor cells are continually replaced and have the further capacity to replace themselves rapidly in response to injury. With every hard sneeze and with every burnt tongue from a hot cup of coffee, olfactory and taste receptor cells are destroyed and then replaced. In addition, chronic rhinosinusitis and nasal polyps can affect olfactory function, and a variety of prescription medications can harm taste cells. Taste and olfactory receptor cells are the only known mammalian sensory cells with this native regenerative capability, and the olfactory system is now used as a model system in studies of neuronal regeneration and the biology of multipotent stem cells. Unfortunately, the plasticity of the olfactory system declines with age, with important consequences to the health of the increasingly aged population. The perceived quality of foods moves toward blandness in the elderly and this affects food intake, diet and overall nutrition, and health status. Prevention of this age-related decline in olfactory sensitivity is being studied by NIDCD investigators.

The molecular biological studies of olfactory and taste receptor cells have provided essential information about the sensitivities of the chemical senses at the first level of neural integration. The coding of odorants and tastants by the central nervous system begins at the level of the receptor cell. In addition, in both the olfactory and gustatory systems, odor and taste quality coding are further refined by computational processes of the central nervous system. NIDCD-funded projects using a wide range of approaches including optogenetics, in vivo recording, psychophysics, and neural imaging and tracing are examining the temporal and spatial nature of central coding and the functional connectivity between chemosensory brain areas. Understanding how taste and smell information is represented and integrated in the brain to form flavor perceptions, and how this process is shaped by experience, may provide insights into strategies for modifying eating disorders.

Voice, Speech, and Language

Studies in the voice and speech program focus on determining the nature, causes, treatment, and prevention of a variety of disorders of motor speech production throughout the lifespan. Research is being conducted on disorders such as stuttering, speech-sound acquisition disorders, childhood apraxia of speech, voice disorders, and swallowing disorders. When oral speech communication may not be a realistic option for individuals with severe dysarthria, alternative and augmentative communication (AAC) devices and strategies are used. Substantial progress has been made in the development of augmentative communication devices

to facilitate the expressive communication of persons with severe communication disabilities. An investigation of performance by young users of augmentative communicative devices is in progress. By providing access to computers, including a brain-computer interface communication prosthesis, individuals with disabilities can immediately use personal computer software programs and speech synthesizers for augmentative communication.

NIDCD-funded investigators are actively working to provide locked-in individuals with a direct means of producing speech to allow rapid communication between the individual and caregivers. The individual's control of computers will be enabled through development of a direct brain-to-speech generator that uses a person's neural signals.

NIDCD-funded investigators are studying a variety of treatments interventions for voice and speech disorders. One study is comparing behavioral treatments for voice disorders in school teachers. Basic research is laying the groundwork for translational research towards creating a more successful treatment of laryngeal paralysis and other peripheral nerve injuries. Others are studying the limbic and motor system interaction in laryngeal function using an animal model to better understand mechanisms of voice disorders and speech disorders and their recovery.

Language research continues to expand our knowledge of the role played by each brain hemisphere in communication and language, early specialization of the brain, and the recovery process following brain damage. This research will further our understanding of the neural bases of language and language disorders. Research on acquisition, characterization, and utilization of American Sign Language is expanding knowledge of the language used by many people who are deaf.

Language researchers supported by NIDCD are also exploring the genetic bases of child speech and language disorders, as well as characterizing the linguistic and cognitive deficits in children and adults with language disorders. Researchers are developing effective diagnostic and intervention strategies for children who are autistic, or have specific language impairment, as well as adults with aphasia. NIDCD researchers are providing critical information regarding ways of predicting useful speech development in children with autism, as well as identifying efficacious approaches to assessing language, social, and behavior functioning in nonverbal school-aged children with autism. Such information will provide much-needed guidance in selecting among existing communication treatments and guide the development of new communication treatments for children with autism.

Clinical Trials

The NIDCD clinical trials program provides the highest level of evidence to support new medical and behavioral interventions to treat and rehabilitate communication disorders. NIDCD supports all phase I, II, and III randomized clinical trials in mission areas of hearing, balance, taste, smell, voice, speech, and language. Studies include, among others: auditory retraining for tinnitus; targeted neuroplasticity via vagal nerve stimulation for tinnitus; cochlear implants in children with developmental delay; robotic percutaneous cochlear implantation; in-home auditory training in older adults with hearing aids; impact of hearing aid cost and service delivery on user satisfaction and quality of life; micronutrient prevention of noise-induced hearing loss; anakinra for steroid-resistant autoimmune sensorineural hearing loss; celecoxib treatment of recurrent respiratory papillomatosis; prevention and treatment of voice problems in teachers; novel voice therapy in children with vocal nodules; telemedicine for language development in cochlear implant recipients; novel techniques for aphasia rehabilitation; transcranial direct current stimulation for aphasia; and novel cleft palate surgery to prevent otitis media.

Epidemiology and Statistics

NIDCD supports epidemiological (clinical) and population-based research studies in all seven mission areas of the Institute: hearing, balance, smell, taste, voice, speech, and language. Studies assess impairments of hearing and other communication disorders across the lifespan, including risks associated with other health conditions as well as behavioral, demographic, environmental, and genetic factors. The research studies supported include longitudinal cohort studies, population-based health interview or examination cross-sectional surveys, and case-control studies, such as community-based and nationally-representative health interview and examination surveys to advance knowledge of the prevalence and determinants of communication disorders. The program maintains research collaborations on national health interview and examination surveys with other Federal agencies and with academic and private sector organizations via research contracts or interagency agreements. NIDCD epidemiologists have contributed to the analysis and interpretation of trends for the Hearing Health Promotion, Office of the Secretary, Department of Health and Human Services, and the development of Healthy People 2020, which incorporates health objectives for all seven mission areas of the NIDCD. Consultation on the design and analysis of studies of therapeutic interventions, disease prevention or progression, and environmental or genetic causes are provided as well as statistical methods that are developed and data systems are supported for the purposes of tracking prevalence rates and estimation of relative and attributable risks.

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National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

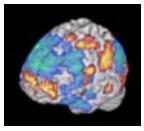
Recent Photos from the National Institute on Deafness and Other Communication Disorders (NIDCD)

2010 PHOTOS

Dr. Jay Rubinstein (left) and Dr. Jennifer Hsia implant a novel vestibular prosthesis in a patient at the University of Washington Medical Center. This is the first time a prosthesis for balance disorders has ever been implanted in a human. In the United States, more than 150,000 individuals are estimated to suffer from severe to profound bilateral vestibular deficiency, and a prosthesis like this potentially could benefit many of them, as well as patients with episodic disabling vestibular dysfunction such as Ménière's disease. NIDCD funding helped support development of the device and preclinical animal testing for its use in the treatment of balance disorders. (Photo credit: Clare McLean, University of Washington)
lo-res | hi-res

Dr. Peter Gillespie, professor of otolaryngology at Oregon Health and Science University, delivered the first Robert J. Wenthold Memorial lecture on The Hair Bundles' Protein Constellation. The seminar, part of the NIH Neuroscience Seminar Series, was in honor of Bob Wenthold who served as NIDCD's scientific director from 1998 through 2008, and was a vital force in helping build the NIDCD intramural program's research foundation in such areas as genetics, molecular and developmental biology, computational modeling and brain imaging. On the clinical side, he championed NIDCD's Otolaryngology Research Fellow Program, a program that provides research training under the mentorship of NIDCD scientists and helps move research findings on potential treatments from the laboratory into clinical practice.(Photo credit: NIH Medical Arts)
lo-res | hi-res

2008 PHOTOS



In February 2008, NIDCD researchers reported that they'd used functional MRI to study the brains of musicians playing improvised jazz. The images revealed that a large brain region involved in monitoring one's performance shuts down during creative improvisation, while a small region involved in organizing self-initiated thoughts and behaviors is highly activated. (Image courtesy of Charles J. Limb and Allen R. Braun, NIDCD.)
lo-res | hi-res

In October 2008, NIDCD launched a new campaign to protect the hearing of tweens. A new web site offers parents resources to help tweens avoid hearing loss from noise.
lo-res | hi-res

NIDCD Director Dr. James Battey, Jr., delivered opening remarks at the Institute's anniversary symposium highlighting 20 years of research accomplishments on October 23, 2008. (Photo by Bill Branson, NIH Medical Arts and Photography Branch)
lo-res | hi-res

Dr. Richard Axel, university professor and investigator in the Howard Hughes Medical Institute, Columbia University, spoke on "Internal Representations of the Olfactory World" at the NIDCD 20th Anniversary Symposium. Dr. Axel is a recipient of the 2004 Nobel Prize in Physiology or Medicine for his groundbreaking research on the sense of smell. (Photo by Bill Branson, NIH Medical Arts and Photography Branch)
lo-res | hi-res

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

National Institute of Dental and Craniofacial Research

Mission | Important Events | Legislative Chronology | Director | Programs | Photo Gallery

Until October 21, 1998, the National Institute of Dental Research

MISSION

The mission of the National Institute of Dental and Craniofacial Research (NIDCR) is to improve oral, dental, and craniofacial health through research, research training, and the dissemination of health information. We accomplish our mission by:

- Performing and supporting basic and clinical research;
- Conducting and funding research training and career development programs to ensure an adequate number of talented, well-prepared, and diverse investigators;
- Coordinating and assisting relevant research and research-related activities among all sectors of the research community;
- Promoting the timely transfer of knowledge gained from research and its implications for health to the public, health professionals, researchers, and policy-makers.

IMPORTANT EVENTS IN NIDCR HISTORY

1931—The U.S. Public Health Service created a Dental Hygiene Unit at NIH and designated Dr. H. Trendley Dean as the first dental research worker. His primary function was to apply principles of epidemiology to a series of community studies on the oral disease known as mottled enamel. His research on fluoride showed not only its relation to mottled enamel, but also its influence on tooth decay.

1945—Following fluoridation of the water supply in Grand Rapids, Michigan, annual examinations of children were begun to study the effects of fluoride on the development of dental caries.

1948—On June 24, Public Law 80-755, the National Dental Research Act created the National Institute of Dental Research (NIDR) and the National Advisory Dental Research Council. On September 16, the institute was established.

1949—The first meeting of the National Advisory Dental Research Council was held on January 10. The institute-supported grants program was initiated, and the first grants and fellowships were awarded.

1954—Results of the first 10 years of the Grand Rapids study firmly established water fluoridation as a safe, effective, and economical procedure for the control of dental caries.

On October 30, the first meeting of the Board of Scientific Counselors was held. This board was established to provide advice to NIDR on matters of general policy, particularly from a long-range viewpoint, as they relate to the intramural program.

1958—The Laboratory of Biochemistry was established to conduct research studies on the chemistry and structure of collagen, elastin, and other proteins. President Dwight D. Eisenhower signed the appropriations bill, which included provisions to finance the construction of a building for the dental institute.

1960—On September 21, the cornerstone was laid for the dental institute building (Building 30) at NIH.

1961—On May 26, U.S. Department of Health, Education, and Welfare (HEW) Secretary Abraham A. Ribicoff dedicated the new NIDR building.

1962—The first grant for a multidisciplinary study of cleft palate was awarded to the University of Pittsburgh Health Center.

1963—Fifteen years of scientific accomplishment by NIDR were cited by scientists, administrators, and health educators on June 14 in a special anniversary

observance.

1966—A reorganization of the institute's extramural programs was implemented to more adequately plan and support research and training programs designed to attack the major dental diseases and disorders—dental caries, periodontal disease, and oral-facial anomalies.

1967—An NIDR program of grant support was initiated for the development of several dental research institutes/centers in university environments. This program was designed to utilize all of the appropriate resources of the parent universities to create ideal research and training environments, fostering interdisciplinary approaches to the complex problems of oral diseases and disorders.

1971—The National Caries Program was launched utilizing funds specifically earmarked to accelerate development of preventive methods to reduce tooth decay.

1973—The Laboratory of Oral Medicine was established to conduct both clinical and laboratory research on the cause, prevention, and treatment of diseases of the soft tissue of the oral cavity.

On June 28-29, a scientific conference commemorating the silver anniversary of NIDR was convened in Washington, D.C.

1974—To encompass the expanded research studies conducted by the Laboratory of Microbiology, the Laboratory of Microbiology and Immunology was established. Laboratory programs involve the role of host factors in periodontal diseases, autoimmune diseases, and allergic disorders.

To emphasize anesthesia-analgesia dental problems, the NIDR reorganized its intramural program to form a Neurobiology and Anesthesiology Branch composed of the neural mechanism section and the anesthesiology section. The branch collaborates closely with the extramural programs concerned with pain control and behavioral studies.

1975—Having established the safety and efficacy of several caries preventive measures, the NIDR initiated selected school demonstration projects through its National Caries Program.

1977—The institute established its first 2 specialized clinical research centers in periodontal diseases.

In June, Dr. Marie U. Nylen was named director of intramural research, the first woman to hold such a position at NIH.

1978—NIDR sponsored its first consensus development conference, *Dental Implants—Benefit and Risk*, to examine available data, suggest future research, and draft guidelines for implant therapy.

1980—The Diagnostic Systems Branch was created to pursue research and development of noninvasive diagnostic techniques, and analysis of the functional development of the oral and pharyngeal region.

The Clinical Investigations and Patient Care Branch was established to emphasize the integral association between the Institute's patient treatment and clinical dental research programs.

1982—The Laboratory of Biological Structure and the Laboratory of Biochemistry were replaced by the Laboratory of Oral Biology and Physiology and a Mineralized Tissue Research Branch. The Laboratory of Oral Biology and Physiology conducts research on the cell biology of secretory tissues and the chemical modification of proteins. Skeletal development, regulation, and disorders are under investigation in the Mineralized Tissue Research Branch.

1983—On March 21, the NIDR opened the first multidisciplinary pain clinic in the U.S. devoted exclusively to research. The clinic provides an opportunity for all NIH researchers and clinicians to pool their knowledge and exchange ideas about the pathophysiology and treatment of pain.

The institute initiated an annual honorary lecture to recognize outstanding scientific accomplishment in basic and clinical research and to honor distinguished scientists who have made important contributions in areas of research directly related to the interests of NIDR.

1984—NIDR inaugurated the Dentist Scientist Award Program designed to provide opportunities for dentists to develop into independent biomedical investigators in the oral health research field.

The institute completed its Long-Range Research Plan FY 1985-89 entitled Challenges for the Eighties. Under the direction of NIDR Director Dr. Harald Löe, a coordinating committee prepared this 5-year plan and summary of progress in the oral sciences and in disease prevention, diagnosis, and treatment. The document pinpoints 14 emphasis areas for NIDR's oral health research.

NIDR established 3 new specialized caries research centers in university environments to continue research investigations into the cause, treatment, and prevention of dental decay.

An NIDR reorganization disbanded the National Caries Program and created the Epidemiology and Oral Disease Prevention Program (EODPP). The EODPP is devoted to research on the etiology, incidence, and prevalence of dental caries, periodontal diseases, and other oral diseases and disorders.

A realignment of the administrative offices within the Office of the Director was completed and established the Office of Planning, Evaluation and Communications (OPEC).

An NIDR annual lecture series was named for a former institute director. The "Seymour J. Kreshover Lecture" is given each September at NIH.

1985—NIDR convened a meeting at NIH of over 160 deans and senior officials from almost every U.S. and Canadian dental school to explore key issues in dental research and education. The conference, first of its kind in NIDR history, was designed to strengthen the relationship between the institute and universities.

1986—NIDR completed its first nationwide survey on the dental health of American adults—the most comprehensive survey of its kind ever done, and the first to look at the prevalence of root caries and periodontal disease in detail.

1988—NIDR celebrated its 40th anniversary with a year-long agenda of commemorative activities.

NIDR funded 4 new oral biology research centers.

The institute released findings of its second National Caries Prevalence Study. Data show half of all American schoolchildren have no tooth decay.

NIDR held its second consensus development conference on dental implants. According to the summary statement, the use of dental implants has increased fourfold from 1983 to 1987.

NIDR and the Fogarty International Center launched an international oral health research study to identify oral health issues that would benefit most from international collaborative research.

The institute launched the "Research and Action Program to Improve the Oral Health of Older Americans and Other Adults at High Risk." The goal is to eliminate toothlessness and prevent further deterioration of oral health in individuals who have compromised dentition.

1990—The institute completed the *NIDR Long-Range Research Plan for the Nineties: Broadening the Scope*, the blueprint for research in this decade. The plan establishes major initiatives geared to "special care patients" whose oral health is affected by systemic diseases or treatments and to older Americans. The ultimate goal of these initiatives is to eliminate toothlessness among future generations and prevent further deterioration of the oral health of people with compromised dentition.

1991—NIDR hosted a symposium for dental practitioners, "Scientific Frontiers in Clinical Dentistry: An Update at the National Institutes of Health."

The institute sponsored a technology assessment conference on the effects and side effects of dental restorative materials.

1992—The Epidemiology and Oral Disease Prevention Program reorganized to expand the scope of EODPP activities. The program now consists of 4 branches: Molecular Epidemiology and Disease Indicators; Disease Prevention and Health Promotion; Analytical Studies and Decision Systems; and Health Assessment. EODPP is the Federal focus for research in orofacial epidemiology and disease prevention.

A reorganization of the Extramural Program (EP) established the Program Development Branch, consisting of 7 categorical programs and an Office of Policy and Coordination. This office comprises manpower development and training activities and the Program Operations Unit, which includes the Scientific Review Office, the Grants Management Office, and the Contracts Management Office. EP provides grant and contract funds for research and research training.

NIDR hosted a second meeting of the leadership from the nation's dental schools, dental professional organizations and industry to explore ways to enhance the research capacity of dental schools.

1993—The National Oral Health Information Clearinghouse was established as a centralized resource for patients, health professionals, and the public seeking information on the oral health of special care patients.

1994—The intramural, extramural, and epidemiology organizational components of NIDR were redefined from programs to divisions, establishing the Division of Intramural Research, the Division of Extramural Research, and the Division of Epidemiology and Oral Disease Prevention (DEODP).

The DEODP was streamlined from 4 to 3 branches: Analytical Studies and Health Assessment; Disease Prevention and Health Promotion; and Molecular Epidemiology and Disease Indicators.

1995—NIDR sponsored "Partnerships in Communication: A Meeting of Dental Editors," which brought together for the first time at NIH more than 30 editors and executive directors of dental organizations to enhance communication among the group.

The institute met with a diverse group of representatives from pharmaceutical, biotechnology, manufacturing, and other industries to develop ways to accelerate the transfer of research findings into application.

NIDR conducted more than 30 focus groups with professional organizations, NIDR staff, specialty groups, and the public toward the development of a new institute strategic plan.

1996—The first community conference in the institute's history was held in May for employees to review the NIDR strategic planning process to date and to discuss the NIDR mission, vision, situation audit, strategic initiatives, management principles, and plans for the future.

The NIDR sponsored a technology assessment conference on the management of temporomandibular disorders.

The institute's intramural, extramural, and epidemiology organizational components were reorganized into the Division of Intramural Research and the Division of Extramural Research.

NIDR launched its World Wide Web page on the Internet, making all pertinent information available to the public and the research community.

1997—The NIDR's first strategic plan, *Shaping the Future*, was released in July. Focusing on areas of research opportunities, research capacity, and health promotion, the document serves as a critical structure for multiple institute initiatives.

The institute celebrated its 50th anniversary.

A reorganization within the Office of the Director created the Office of International Health, the Office of Science Policy and Analysis, and the Office of Communications and Health Education. The Office of Planning, Evaluation, and Communications was eliminated.

1998—The institute changed its name to National Institute of Dental and Craniofacial Research to accurately reflect its research base. NIDCR became official on October 21, 1998, with the Omnibus Consolidated and Emergency Supplemental Appropriations Act, H.R. 4328.

1999—NIDCR introduced its *Strategic Plan to Reduce Racial and Ethnic Health Disparities*. The plan is designed to support research leading to the reduction and prevention of health disparities, including those in the oral cavity, and to provide research opportunities to increase the diversity of the scientific workforce.

The Office of Information Technology was established within the NIDCR Office of the Director.

2000—The institute hosted the first "NIDCR Patient Advocates Forum." The conference, attended by patient advocates from 15 organizations, was designed to enhance communication between patient liaison groups and NIDCR and to bring the patient perspective to Institute planning and research.

NIDCR served as lead agency for the preparation and publication of *Oral Health In America: A Report of the Surgeon General*, released on May 25th. The report —commissioned by U.S. Department of Health and Human Services Secretary Donna Shalala and released by Surgeon General David Satcher—is the first of its kind to be dedicated solely to oral health.

The institute supported the first-ever national, multidisciplinary meeting on children and oral health, "Face of a Child," held June 12-13 in Washington, D.C.

2001—The Division of Extramural Research was reorganized into 3 components: Division of Basic and Translational Sciences, Division of Population and Health Promotion Sciences, and Division of Extramural Activities.

NIDCR sponsored a consensus development conference on the “Diagnosis and Management of Dental Caries Throughout Life.”

The institute released its strategic plan to eliminate craniofacial, oral, and dental health disparities.

NIDCR funded 5 new Centers for Research to Reduce Oral Health Disparities.

2003—NIDCR released its Strategic Plan for FY 2003-2008. The plan addresses the myriad diseases and conditions that affect the oral cavity and craniofacial structures by outlining a course for the institute to follow in the areas of research, research training, and communication of research results.

The institute was a lead agency in preparing *A National Call to Action to Promote Oral Health,* released April 29, 2003, by U.S. Surgeon General Richard Carmona.

2005—NIDCR awarded 3 major grants that establish regional "practice-based" research networks to investigate with greater scientific rigor everyday issues in the delivery of oral health care.

Two extramural research programs were reorganized into 4 centers focusing on craniofacial research, infectious diseases and immunology, clinical research, and health promotion and behavioral research.

2006—NIDCR integrated its extramural programs into 2 centers—the Center for Integrative Biology and Infectious Diseases and the Center for Clinical Research—and a Biotechnology and Innovation Program.

2007—NIDCR reorganized its extramural program to better reflect the current NIH extramural model. The Center for Integrative Biology and Infectious Diseases was renamed the Division of Extramural Research (DER); the Center for Clinical Research is now part of the DER.

2008—NIDCR celebrated its 60th anniversary. View Images.

2009—NIDCR released its 2009-2013 Strategic Plan. The plan provides a guide for the institute’s funding decisions and defines areas to monitor for key developments and innovations that can be applied to oral, dental, and craniofacial health. View Image.

The institute launched the FaceBase Consortium, a 5-year initiative that will compile the biological instructions to build the middle region of the human face and precisely define the genetics underlying its common developmental disorders, such as cleft lip and palate. View Image.

2010—On August 19, NIH Director Francis S. Collins appointed NIDCR Director Lawrence Tabak as Principal Deputy Director, NIH. Dr. Tabak had been director of NIDCR since September 2000. He was acting principal deputy NIH director from November 2008 to August 2009, and had also served as acting director of the Division of Program Coordination, Planning, and Strategic Initiatives. Dr. Collins named Dr. Isabel Garcia Acting Director, NIDCR. View Image

NIDCR completed its commitment of American Recovery and Reinvestment Act (ARRA) funds. The Institute’s two-year Recovery Act funding totaled $101.8 million and provided support for 141 new or competing two-year research and research training grants, 128 administrative supplements to scientists with active NIDCR grants, and research projects in 33 states. The ARRA funds allowed NIDCR to make strategic investments in virtually all areas of dental, oral, and craniofacial research. View Image.

The NIDCR-sponsored Attack of the S. mutans! was featured in the NIH pavilion at the October 23-24 USA Science & Engineering Expo on the National Mall in Washington, D.C. *Attack of the S. mutans!* is a 3-D interactive game that aims to advance understanding of the tooth decay process, including the role of a bacterium known as *S. mutans*. The game was developed with funding from NIDCR and NIH’s National Center on Minority Health and Health Disparities. View Image

2011—Martha J. Somerman, D.D.S., Ph.D., was appointed as the eighth director of the NIDCR in May. Prior to her appointment, she was the dean at the University of Washington School of Dentistry in Seattle, a position she had held since 2002. She began her duties as NIDCR director on August 29. NIH Director Francis S. Collins, M.D., Ph.D., selected Somerman. View Image.

On December 13, the Department of State's U.S. global AIDS coordinator Dr. Eric Goosby presented the 2011 David E. Barmes Global Health Lecture on the NIH campus. His lecture, titled, "PEPFAR: Moving from Science to Program to Save Lives," highlighted the work done through the President's Emergency Plan for AIDS Relief (PEPFAR), a program launched eight years ago that Goosby currently oversees as ambassador. The Barmes lecture is an annual event cosponsored by NIDCR and the Fogarty International Center. View Image.

NIDCR LEGISLATIVE CHRONOLOGY

June 24, 1948—Public Law 80-755 established NIDR to conduct, support, and foster research investigations on the causes, treatment, and prevention of dental diseases and conditions.

August 1, 1958—President Eisenhower signed an HEW appropriation bill that included provisions to finance construction of laboratory facilities to house NIDR.

October 21, 1998—The institute's name change to the NIDCR became official when President Bill Clinton signed the Omnibus Consolidated and Emergency Supplemental Appropriations Act, H.R. 4328.

BIOGRAPHICAL SKETCH OF DIRECTOR MARTHA J. SOMERMAN, D.D.S., PH.D.

Martha J. Somerman, D.D.S., Ph.D. became the eighth director of the National Institute of Dental and Craniofacial Research, a component institute within the National Institutes of Health, on August 29, 2011. In this position, Dr. Somerman oversees an extensive research portfolio and leads the Institute's team of more than 400 scientists and administrators.

A widely respected periodontist, educator and researcher, Dr. Somerman served as the dean of the University of Washington School of Dentistry, a post she held from 2002-2011 while continuing to teach in the school's Department of Periodontics, and as an adjunct professor in the Department of Oral Biology. Under her leadership, the School of Dentistry stepped up its efforts to attract students from diverse backgrounds who were committed to giving back to underserved communities. She was a strong and vocal supporter of the school's Dental Education in Care of Persons with Disabilities (DECOD) program, which for more than three decades has been one of the few dental care resources available to Washington residents with developmental or acquired disabilities. She also served on the medical staff of the Seattle Cancer Care Alliance and as a member of the associate medical staff of the University of Washington Medical Center and the Harborview Medical Center.

Prior to her work at the University of Washington, Dr. Somerman was on the faculty of the University of Michigan School of Dentistry from 1991 to 2002 and the Baltimore College of Dental Surgery from 1984 to 1991. At Michigan, she served as chair of the Department of Periodontics, Prevention and Geriatrics, and held the William K. and Mary Anne Najjar Endowed Professorship, and also served as professor in the Department of Pharmacology in the University of Michigan School of Medicine from 1995 to 2002. In Baltimore, she was a professor in the departments of periodontics and pharmacology. Her own research has focused particularly on understanding tooth root development and on the application of that understanding to periodontal regeneration.

Dr. Somerman is a diplomate of the American Board of Periodontology and a past president of the American Association for Dental Research. She has received numerous honors and awards, including the College of Dentistry Distinguished Scientist Award in 2012 from New York University, the Paul Goldhaber Award from the Harvard School of Dental Medicine in 2011, the Geis Award from the American Academy of Periodontology and the Distinguished Scientist Award for Research in Oral Biology from the International Association for Dental Research (IADR). In 2010, she was a co-winner of the first IADR/Straumann Award in Regenerative Periodontal Medicine. She is also a fellow of the American Association for the Advancement of Science, the International College of Dentists, and the American College of Dentists.

Along with her D.D.S from New York University, Dr. Somerman holds a Ph.D. in pharmacology from the University of Rochester, along with a certificate in periodontics from Eastman Dental Center in Rochester, NY.

NIDCR DIRECTORS

Name	In Office from	To
H. Trendley Dean	September 17, 1948	March 31, 1953
Francis A. Arnold, Jr.	April 1,1953	February 1966
Seymour J. Kreshover	February 1966	June 30, 1975
Clair L. Gardner (Acting)	July 1,1975	December 31, 1975
David B. Scott	January 1, 1976	December 31, 1981
John F. Goggins (Acting)	January 1, 1982	December 31, 1982
Harald Löe	January 1983	June 1, 1994
Dushanka V. Kleinman (Acting)	June 1994	June 1995
Harold C. Slavkin	July 1995	July 14, 2000

Lawrence A. Tabak	September 2000	August 19, 2010
A. Isabel Garcia (Acting)	August 19, 2010	August 28, 2011
Martha J. Somerman, D.D.S., Ph.D.	August 29, 2011	Present

RESEARCH PROGRAMS

Division of Extramural Research

Through its Division of Extramural Research, the institute provides research funds outside its intramural laboratories and clinics in Bethesda, Maryland. These funds are made available in the form of grants, cooperative agreements, and contracts, which support scientists working in institutions throughout the U.S. and in foreign countries. These scientists conduct basic, translational, patient-oriented and demonstration research to increase understanding of fundamental processes in health and disease, and to promote timely transfer and community adoption of research findings. The institute also supports research training and career development to ensure an adequate pool of research personnel.

The Division of Extramural Research comprises 3 branches and 1 center:

The *Behavioral and Social Sciences Research Branch* coordinates the research activities in this field that span the Institute's extramural research program. With a focus on disease prevention and health promotion, the branch supports biobehavioral, social science, health literacy, communication, and informatics research.

The *Integrative Biology and Infectious Diseases Branch* supports basic and translational research on the microbial and immunological aspects of oral diseases such as dental caries, periodontal diseases, oral candidiasis, and head and neck cancer. Programs also focus on research into the underlying mechanisms of the oral complications of HIV/AIDS, as well as salivary gland biology and processes involved in orofacial pain. In addition, the branch supports research on mineralized tissues, dental and biomaterials, tissue engineering, regenerative medicine and technology development.

The *Translational Genomics Research Branch* supports research to understand developmental biology and the genetic factors that contribute to oral, dental, and craniofacial diseases and to apply genetic information and technologies to the development of new diagnostic and treatment strategies. The program also funds studies that explore the mechanisms by which human genes and proteins interact with environmental and behavioral factors to cause conditions more commonly seen in dental practice, such as clefting, dental caries, periodontal disease, and oral cancer.

The *Center for Clinical Research* supports patient-oriented and population-based research, including clinical trials, practice-based networks, epidemiology, and health disparity research in all areas of program interest to NIDCR. The center also develops and supports programs to foster diversity in the scientific workforce, as well as clinical research activities aimed at the health of vulnerable and special needs populations.

Division of Extramural Activities

The Division of Extramural Activities provides leadership and advice in developing, implementing, and coordinating extramural programs and policies. The division has 3 components:

The *Grants Management Branch* is the focal point for all business-related activities associated with the negotiation, award, and administration of grants and cooperative agreements within the NIDCR.

The *Scientific Review Branch* coordinates the initial scientific peer review of applications for the following mechanisms of support: research center grants, program project grants, small research grants, research conference grants, institutional training grants, fellowship and career development grants, dentist scientist awards, grants awarded in response to requests for applications and certain program announcements issued by NIDCR, investigator-initiated clinical trials, cooperative agreements, and all proposals for research and development contracts.

The *Research Training and Career Development Branch* oversees and coordinates the Institute's programs for extramural fellowships, training grants, career development awards, dental school curriculum development grants, NIH loan repayment awards, and diversity supplements. The aim of these programs is to ensure an adequate number of talented, well-prepared, and diverse investigators to conduct dental, oral, and craniofacial research in the institute's scientific priority areas.

Division of Intramural Research

Scientists in the Division of Intramural Research conduct basic laboratory, translational, and clinical research in support of craniofacial and dental health. Using the latest techniques in biomedical science, researchers investigate the biochemistry, structure, function and development of bone, teeth, salivary glands, connective tissues and the immune system. Studies also focus on the role of bacteria and viruses in oral disease, genetic and acquired disorders of the craniofacial region, tumors of the oral cavity, the causes and treatment of acute and chronic pain, and the development of new and improved methods to diagnose oral disease. The division has approximately 300 employees and guest researchers in 27 laboratories and several laboratory and clinical support facilities. These support facilities include the Dental Clinical Research Core, Combined Technical Core (including DNA Sequencing, Fluorescence Activated Cell Sorting, Laser Capture Microscopy, and Cell Elutriation), Gene Targeting Core, Information Technology Core, Veterinary Resources Core, and Technology Transfer.

The *Dental Clinical Research Core* supports the research efforts of NIDCR and other NIH Institutes by providing dental medicine expertise for clinical studies and dental consult services to the unique patient populations at the NIH Clinical Center.

The *Craniofacial and Skeletal Diseases Branch* studies development and structure of hard tissues—bones, teeth, and cartilage—and associated soft tissues, such as bone marrow, tendons, and ligaments. Emphasis is placed on genetic and acquired disorders through basic, clinical, and translational research, including studies on

adult stem cells and their biological activities; and the synthesis, maintenance and destruction of extracellular matrices—the major components of most tissues that are critical in craniofacial tissue development, function, and health.

The *Laboratory of Cell and Developmental Biology* explores the regulation and roles of the extracellular matrix, a key component of many tissues, and other cell interaction systems in embryonic development and tissue function. Research focuses on understanding normal and abnormal embryonic development of craniofacial and other tissues; processes involved in tissue repair, cancer, and bacterial interactions; and translational approaches to replacing or regenerating defective or damaged tissues.

The *Laboratory of Sensory Biology* investigates fundamental mechanisms of various types of sensation including taste, somatosensation (touch, pressure, temperature), and pain. The laboratory also studies autoantibodies that predict disease and dense core and synaptic vesicle proteins that are involved in the secretion of hormones and neurotransmitters. Scientists explore how sensory stimuli are detected and processed using a range of laboratory techniques.

The *Molecular Physiology and Therapeutics Branch* pursues a comprehensive bench-to-bedside program to understand the molecular basis of salivary gland function and dysfunction and to develop strategies for the diagnosis, prevention, and management of salivary gland diseases. Clinical and translational studies focus on mechanisms of, and therapies for, salivary gland dysfunction caused by head and neck irradiation and diseases such as Sjogren's syndrome.

The *Oral and Pharyngeal Cancer Branch* explores several aspects of cancer cell biology to identify the faulty molecular mechanisms underlying the development of oral malignancies and their metastatic spread. Investigators are using this knowledge to identify early diagnostic markers and develop novel therapeutic approaches for the prevention and treatment of oral cancer.

The *Developmental Mechanisms Section* investigates mechanisms of cell differentiation in early embryos of sea urchins, an important model for research in developmental biology. Current studies focus on elucidating the mechanisms that regulate 1) anterior nervous system development, some of which are similar to those operating in the vertebrate forebrain 2) separation of endoderm and mesoderm fates within the endomesoderm and 3) a morphological response to changes in food availability. Because initial patterning mechanisms are often highly conserved in evolution, relatively quick and inexpensive experiments in sea urchin embryos may provide a shortcut to understanding similar processes in higher vertebrates, including human beings.

The *Secretory Mechanisms and Dysfunction Section* investigates the molecular nature and function of the ion transport mechanisms involved in the fluid and electrolyte secretion process in the exocrine salivary gland. Scientists are probing the structure-function relationships of cotransporter, exchanger, and channel proteins using a combination of molecular biology, gene modification, proteomics, and functional studies in mouse and human salivary glands. Investigators are using a high-throughput approach to catalogue the human saliva proteome, to identify salivary biomarkers for human diseases, and to compile a comprehensive list of the plasma membrane proteins expressed in salivary glands.

The *Section on Biological Chemistry* conducts basic research on biosynthesis, structure, and function of glycoproteins, placing a special emphasis on mucin-type O-glycans. As glycans cannot be readily altered directly, studies are focusing on modulating the activity of the family of glycosyltransferases that initiate mucin-type O-glycosylation (the UDP GalNAc polypeptide:N-Acetylgalactosaminyltransferases) as a means of probing O-glycan function.

This page last reviewed on August 6, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Recent Photos from the National Institute of Dental and Craniofacial Research (NIDCR)

2011 PHOTOS

NIDCR Director Somerman Sworn In
On Aug. 31, Dr. Martha Somerman took the oath of office as the eighth director of the National Institute of Dental and Craniofacial Research in a ceremony officiated by NIH director Dr. Francis Collins. Also attending was Dr. Lawrence Tabak, NIH principal deputy director and former director of NIDCR.

lo-res | hi-res

Ambassador Eric Goosby Delivers 2011 David E. Barmes Lecture
Department of State's U.S. global AIDS coordinator Dr. Eric Goosby delivered the 2011 David E. Barmes Lecture on December 13 on the NIH campus. His lecture, titled, "PEPFAR: Moving from Science to Program to Save Lives," will highlight the work done through the President's Emergency Plan for AIDS Relief (PEPFAR), a program launched 8 years ago that Goosby currently oversees as ambassador. The Barmes lecture is an annual event cosponsored by NIDCR and the Fogarty International Center.

lo-res | hi-res

2010 PHOTOS

On August 19, 2010, NIH Director Francis S. Collins appointed NIDCR Director Lawrence Tabak as Principal Deputy Director, NIH. Dr. Tabak had served as director of NIDCR since September 2000.

lo-res | hi-res

With funding from the American Recovery and Reinvestment Act, NIDCR issued a grant to Dr. Tracie Ferreira's lab to map the location of a gene in zebrafish that is involved in cartilage development. The gene could be a key component in craniofacial development in vertebrates, including humans. The grant also provides the means for students from underserved communities a chance to work with Dr. Ferreira in her lab at the University of Massachusetts at Dartmouth.

lo-res

Attack of the S. mutans! was featured in the NIH pavilion at the October 23-24, 2010 USA Science & Engineering Expo on the National Mall in Washington, D.C. The finale of a two- week-long festival, the Expo had more than 500 exhibitors, 1,500 hands-on activities, and 75 stage shows. *Attack of the S. mutans!* is a 3-D interactive game that aims to advance understanding of the tooth decay process, including the role of a bacterium known as *S. mutans*, while assessing how the use of games can change behavior. The game was created with funding from NIDCR and NIH's National Center on Minority Health and Health Disparities.

lo-res | hi-res

2009 PHOTOS

NIDCR's new Strategic Plan 2009-2013 is built on four key goals: widening the scope of inquiry, strengthening the research pipeline, fostering novel clinical research avenues, and eliminating oral health disparities.

lo-res | hi-res

In 2009, NIDCR issued the first research and technology grants for its new FaceBase Consortium. This project will enhance understanding of the genetic and environmental influences that drive craniofacial development and will yield new opportunities for preventing and treating craniofacial defects, like cleft lip and palate. (Courtesy of the Rowden Family)

lo-res | hi-res

2008 PHOTOS

On June 24, 1948, President Harry S. Truman signed legislation that created the National Institute of Dental Research as the third institute of the National Institutes of Health.
lo-res | hi-res

NIDCR commemorated its 60th anniversary with scientific symposia held at NIH and at major dental research meetings around the country and abroad.
lo-res | hi-res

This page last reviewed on March 29, 2012

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

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National Institutes of Health
Turning Discovery Into Health

NIDDK National Institute of Diabetes and Digestive and Kidney Diseases

Mission | Overview | Important Events | Legislative Chronology | Director | Programs | Photo Gallery

Until May 19, 1972, the National Institute of Arthritis and Metabolic Diseases; until June 23, 1981, the National Institute of Arthritis, Metabolism, and Digestive Diseases; and until April 8, 1986, the National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases.

MISSION

The mission of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) is to conduct and support medical research and research training and to disseminate science-based information on diabetes and other endocrine and metabolic diseases; digestive diseases, nutritional disorders, and obesity; and kidney, urologic, and hematologic diseases, to improve people's health and quality of life.

OVERVIEW

The NIDDK supports a wide range of medical research through grants to universities and other medical research institutions across the country. The Institute also supports government scientists who conduct basic, translational, and clinical research across a broad spectrum of research topics and serious, chronic diseases and conditions related to the Institute's mission. In addition, the NIDDK supports research training for students and scientists at various stages of their careers and a range of education and outreach programs to bring science-based information to patients and their families, health care professionals, and the public.

External research funded by the NIDDK is organized into three scientific program divisions:

- Diabetes, Endocrinology, and Metabolic Diseases
- Digestive Diseases and Nutrition
- Kidney, Urologic, and Hematologic Diseases

The NIDDK's overarching principles in moving research forward include:

- maintaining a vigorous, investigator-initiated research portfolio that supports cross-cutting science that can be broadly applied to many disease-specific research areas
- supporting pivotal clinical studies and trials, with a focus on substantial participation from minority and underserved groups
- preserving a stable pool of talented new investigators
- fostering exceptional research training and mentoring opportunities
- ensuring that science-based health information reaches patients, their families, health care providers and the public through communications and outreach activities

IMPORTANT EVENTS IN NIDDK HISTORY

August 15, 1950—President Harry S. Truman signed the Omnibus Medical Research Act into law, establishing the National Institute of Arthritis and Metabolic Diseases (NIAMD) in the U.S. Public Health Service. The new Institute incorporated the laboratories of the Experimental Biology and Medicine Institute, and expanded to include clinical investigation in rheumatic diseases, diabetes, and a number of metabolic, endocrine, and gastrointestinal diseases.

November 15, 1950—The National Advisory Arthritis and Metabolic Diseases Council held its first meeting and recommended approval of NIAMD's first grants.

1959—Dr. Arthur Kornberg, former chief of the Institute's enzyme and metabolism section, won the Nobel Prize for synthesizing nucleic acid.

1961—Laboratory-equipped mobile trailer units began an epidemiological study of arthritis among the Blackfeet and Pima Indians in Montana and Arizona, respectively.

October 16, 1968—The Nobel Prize was awarded to Dr. Marshall W. Nirenberg of the National Heart Institute, who reported his celebrated partial cracking of the genetic code while an NIAMD scientist.

November 1970—The Institute celebrated its 20th anniversary. U.S. Secretary of Defense Melvin R. Laird addressed leaders in the department, representatives from voluntary health agencies and professional biomedical associations, and past and present Institute National Advisory Council members.

May 19, 1972—The Institute's name was changed to the National Institute of Arthritis, Metabolism, and Digestive Diseases (NIAMDD).

October 1972— Dr. Christian B. Anfinsen, chief of the Institute's Laboratory of Chemical Biology, shared a Nobel Prize with two other American scientists for demonstrating one of the most important simplifying concepts of molecular biology: that the three-dimensional conformation of a native protein is determined by the chemistry of its amino acid sequence. A significant part of the research cited by the award was performed while Anfinsen was with the NIH.

September 1973—The creation of the first Diabetes-Endocrinology Research Centers marked the beginning of the Institute's Diabetes Centers Program.

November 1975—After nine months of investigation into the epidemiology and nature of diabetes mellitus and public hearings throughout the United States, the National Commission on Diabetes delivered its report, the *Long-Range Plan to Combat Diabetes*, to Congress. Recommendations included expanding and coordinating diabetes and related research programs; creating a diabetes research and training centers program; accelerating diabetes health care, education, and control programs; and establishing a National Diabetes Advisory Board.

April 1976—The National Commission on Arthritis and Related Musculoskeletal Diseases issued *The Arthritis Plan*. This report to Congress called for increased arthritis research and training programs, multipurpose arthritis centers, epidemiologic studies and data systems in arthritis, a National Arthritis Information Service, and a National Arthritis Advisory Board.

October 1976—Dr. Baruch Blumberg was awarded the Nobel Prize in Physiology or Medicine for research on the hepatitis B virus protein, the "Australia antigen," which he discovered in 1963 while at the Institute. This advance has proven to be a scientific and clinical landmark in detecting and controlling viral hepatitis and led to the development of preventive measures against hepatitis and liver cancer.

April 19, 1977—The NIH director established a trans-NIH program for diabetes, with the NIAMDD taking lead responsibility.

September 1977—Over $5 million in grants was awarded to 5 institutions to establish Diabetes Research and Training Centers.

October 1977—In response to the recommendation of the National Commission on Diabetes, the National Diabetes Data Group was established within the Institute to collect, analyze, and disseminate diabetes data to scientific and public health policy and planning associations.

December 1977—Institute grantees Drs. Roger C.L. Guillemin and Andrew V. Shally shared the Nobel Prize in Physiology or Medicine with a third scientist. Guillemin's and Shally's prizes were for discoveries related to the brain's production of peptide hormones.

1978—The NIDDK created the National Diabetes Information Clearinghouse to increase knowledge and understanding about diabetes among people with these conditions and their families, health professionals, and the general public.

January 1979—The National Commission on Digestive Diseases issued the report, The *National Long-Range Plan to Combat Digestive Diseases*. Recommendations to Congress included establishing a National Digestive Diseases advisory board and information clearinghouse, and emphasizing digestive diseases educational programs more in medical schools.

June 1980—The NIDDK created the National Digestive Diseases Information Clearinghouse to increase knowledge and understanding about digestive diseases among people with these conditions and their families, health professionals, and the general public.

September 1980—Dr. Joseph E. Rall, director of NIAMDD intramural research, became the first person at the NIH to be named to the distinguished executive rank in the Senior Executive Service. President Jimmy Carter presented the award in ceremonies at the White House on September 9.

October 15, 1980—NIAMDD celebrated its 30th anniversary with a symposium, "DNA, the Cell Nucleus, and Genetic Disease." Dr. Donald W. Seldin, chairman of the department of internal medicine, University of Texas Southwestern Medical School, Dallas, was guest speaker.

1981—A report entitled *An Evaluation of Research Needs in Endocrinology and Metabolic Diseases* was prepared by an external group of scientific experts, and was submitted to the NIH and the Senate Committee on Appropriations.

June 23, 1981—The Institute was renamed the National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases (NIADDK).

April 1982—U.S. Department of Health and Human Services (HHS) Secretary Richard S. Schweiker elevated the NIADDK's programs to division status, creating five extramural divisions and the Division of Intramural Research.

November 1982—Dr. Elizabeth Neufeld, chief of the NIADDK's genetics and biochemistry branch, received a Lasker Foundation Award. She was cited, along with Dr. Roscoe E. Brady of the then-named National Institute of Neurological and Communicative Disorders and Stroke (NINCDS), for "significant and unique contributions to the fundamental understanding and diagnosis of a group of inherited diseases called mucopolysaccharide storage disorders (MPS)."

November 1984—Grants totaling more than $4 million were awarded to six institutions to establish the Silvio O. Conte Digestive Diseases Research Centers. The research centers investigate the underlying causes, diagnoses, treatments, and prevention of digestive diseases.

April 8, 1986—The Institute's Division of Arthritis, Musculoskeletal and Skin Diseases became the core of the new National Institute of Arthritis and Musculoskeletal and Skin Diseases. The NIADDK was renamed the National Institute of Diabetes and Digestive and Kidney Diseases.

June 3, 1986—The National Kidney and Urologic Diseases Advisory Board was established to formulate the long-range plan to combat kidney and urologic diseases.

1987—The NIDDK created the National Kidney and Urologic Diseases Information Clearinghouse to increase knowledge and understanding about diseases of the kidneys and urologic system among people with these conditions and their families, health care professionals, and the general public.

August 1, 1987—Six institutions were funded to establish the George M. O'Brien Kidney and Urological Research Centers.

December, 1987—In response to congressional language on the fiscal year (FY) 1988 appropriation for the NIDDK, the Institute established a program of cystic fibrosis research centers.

March, 1990—The National Kidney and Urologic Diseases Advisory Board issued its "Long-Range Plan: Window on the 21st Century." The Plan presented recommendations for uniting the public and private sectors in the quest to prevent these diseases; improve methods for early detection, treatment, and rehabilitation; and ultimately find cures.

September 16, 1990—The NIDDK celebrated its 40th anniversary. Dr. Daniel E. Koshland, Jr., editor of *Science*, was guest speaker.

June, 1991—The NIDDK Advisory Council established the National Task Force on the Prevention and Treatment of Obesity to synthesize current science on preventing and treating obesity and to develop statements about topics of clinical importance based on critical analyses of the scientific literature.

September 30, 1992—Three Obesity/Nutrition Research Centers were established, along with an extramural animal models core to breed genetically obese rats for obesity and diabetes research.

October 12, 1992—Drs. Edwin G. Krebs and Edmond H. Fischer were awarded the Nobel Prize in Physiology or Medicine for their work on "reversible protein phosphorylation." At the time of the award, the scientists had been receiving continuous NIDDK grant support since 1951 and 1956, respectively.

October 30, 1992—In response to congressional language on the Institute's FY 1993 appropriation, the NIDDK initiated a program to establish gene therapy research centers with emphasis on cystic fibrosis.

November 1, 1993—The functions of the NIH Division of Nutrition Research Coordination, including those of the NIH Nutrition Coordinating Committee, were transferred to the NIDDK.

October 10, 1994—Drs. Martin Rodbell and Alfred G. Gilman received the Nobel Prize in Physiology or Medicine for discovering G-proteins, a key component in the signaling system that regulates cellular activity. Dr. Rodbell discovered the signal transmission function of GTP while a researcher at the then-named NIAMD.

June 22, 1997—Led by the NIDDK, the NIH and the U.S. Centers for Disease Control and Prevention (CDC) announced the creation of the National Diabetes Education Program (NDEP) at the American Diabetes Association annual meeting in Boston. The NDEP's goals are to reduce the rising prevalence of diabetes, the morbidity and mortality of the disease, and its complications.

July 18, 2000—The NIDDK created the National Kidney Disease Education Program to raise awareness among the public of kidney disease and its risk factors, and make resources available to consumers and health care providers.

June 2000—To reduce the disproportionate burden of many diseases in minority populations, the NIDDK initiated an Office of Minority Health Research Coordination.

November 16, 2000—The NIDDK celebrated its 50th anniversary. Professional societies in eight U.S. locations and Canada sponsored scientific symposia and hosted an NIDDK exhibit. In addition, *A New Century of Science. A New Era of Hope* was published to highlight research supported and conducted by the NIDDK. The Institute concluded the year with a joint scientific symposium at the Society for Cell Biology's 40th anniversary meeting in December.

October 8, 2003—NIDDK grantee Dr. Peter Agre shared the Nobel Prize in Chemistry with another scientist for studies of channels in cell membranes. Agre discovered aquaporins, proteins that move water molecules through the cell membrane.

October 4, 2004—Dr. Richard Axel, once an intramural research fellow under Dr. Gary Felsenfeld at the NIDDK, shared the Nobel Prize in Physiology or Medicine with another scientist for discovering a large family of receptors selectively expressed in cells that detect specific odors.

October 6, 2004—Long-time grantees Drs. Irwin A. Rose and Avram Hershko shared the Nobel Prize in Chemistry with another scientist for discovering ubiquitin-mediated protein degradation inside the cell.

October 2007—Institute grantee Dr. Oliver Smithies shared the Nobel Prize in Physiology or Medicine with two other scientists for discovering principles for introducing specific gene modifications in mice by using embryonic stem cells.

2010—The NIDDK celebrated its 60th anniversary. Special events included the September 21 scientific symposium "Unlocking the Secrets of Science: Building the Foundation for Future Advances" and the publication of the commemorative report *NIDDK: 60 Years of Advancing Research to Improve Health*. View Image.

September 2010—NIDDK grantee Dr. Jeffrey Friedman and former grantee Dr. Douglas Coleman won the 2010 Albert Lasker Basic Medical Research Award for discovering the hormone leptin, which plays a key role in regulating energy intake and energy expenditure. View Image.

October 3, 2011—NIDDK grantee Dr. Bruce Beutler shared the 2011 Nobel Prize in Physiology or Medicine with NIH grantee Dr. Jules Hoffman for their discoveries

concerning the activation of innate immunity. NIH grantee Dr. Ralph Steinman also shared the award posthumously for his discovery of the dendritic cell and its role in adaptive immunity.

December 2011—The journal *Science* named an HIV-prevention research study led by former NIDDK grantee Dr. Myron Cohen the 2011 Breakthrough of the Year. The study found that people infected with HIV reduced the risk of transmitting the virus to their sexual partners by taking oral antiretroviral medicines when their immune systems were relatively healthy. Cohen received NIDDK funding for basic science research earlier in his career and, at the time of the *Science* announcement, was receiving funding from several NIH components.

April 29, 2012—The Treatment Options for type 2 Diabetes in Adolescents and Youth (TODAY) study, the results of which appeared in the New England Journal of Medicine on April 29, 2012, is the first major comparative effectiveness trial for the treatment of type 2 diabetes in young people. The NIDDK-funded study found that combined therapy with metformin and rosiglitazone was superior to metformin alone. The rate of treatment failure with metformin alone suggested that most youth with type 2 diabetes will require combination treatment or insulin within a few years after diagnosis.

September 21, 2012—Dr. Thomas E. Starzl, distinguished service professor of surgery at the University of Pittsburgh School of Medicine and a longtime NIDDK grantee, received the 2012 Lasker-DeBakey Clinical Medical Research Award — shared with Dr. Roy Calne, University of Cambridge emeritus — for his work developing liver transplantation, an intervention that has restored normal life to thousands of people with end-stage liver disease. View image.

October 2012: Dr. Robert J. Lefkowitz, who trained at NIDDK from 1968-1970 as a clinical associate in the Clinical Endocrinology Branch, won the 2012 Nobel in chemistry for studies of protein receptors that let body cells sense and respond to outside signals.

NIDDK LEGISLATIVE CHRONOLOGY

December 11, 1947—The Experimental Biology and Medicine Institute was established under Section 202 of Public Law (P.L.) 78-410.

August 15, 1950—The Omnibus Medical Research Act (P.L. 81-692) established the NIAMD to "...conduct researches relating to the cause, prevention, and methods of diagnosis and treatment of arthritis and rheumatism and other metabolic diseases, to assist and foster such researches and other activities by public and private agencies, and promote the coordination of all such researches, and to provide training in matters relating to such diseases..." Section 431 also authorized the U.S. Surgeon General to establish a national advisory council.

May 19, 1972—President Richard M. Nixon signed P.L. 92-305 to re-emphasize digestive diseases research by changing the name of the Institute to the National Institute of Arthritis, Metabolism, and Digestive Diseases (NIAMDD) and by designating a digestive diseases committee within the Institute's National Advisory Council.

July 23, 1974—The National Diabetes Mellitus Research and Education Act (P.L. 93-354) was signed. The National Commission on Diabetes, authorized by this act, was chartered on September 17, 1974. The act authorized diabetes research and training centers, and an intergovernmental diabetes coordinating committee that included representatives from the NIAMDD and six other NIH Institutes.

January 1975—The National Arthritis Act of 1974 (P.L. 93—640) was signed into law to further research, education, and training in the field of connective tissue diseases. The act authorized the creation of a national commission, centers for research and training in arthritis and rheumatic diseases, a data bank, and an overall plan to investigate the epidemiology, etiology, control, and prevention of these disorders.

October 1976—The Arthritis, Diabetes, and Digestive Diseases Amendments of 1976 (P.L. 94-562) established the National Diabetes Advisory Board, charged with advising Congress and the Health, Education, and Welfare (HEW) Secretary on implementing the *Long-Range Plan to Combat Diabetes* developed by the National Commission on Diabetes. The law also established the National Commission on Digestive Diseases to investigate the incidence, duration, mortality rates, and social and economic impact of digestive diseases.

December 1980—Title II of the Health Programs Extension Act of 1980, P.L. 96-538, changed the Institute's name to the National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases. The Act also established the National Digestive Diseases Advisory Board. The law authorized the National Diabetes Information Clearinghouse, the Diabetes Data Group, and the National Digestive Diseases Information and Education Clearinghouse. In addition, it reauthorized advisory boards for arthritis and diabetes research.

November 20, 1985—The Health Research Extension Act of 1985 (P.L. 99-158) changed the Institute's name to the National Institute of Diabetes and Digestive and Kidney Diseases. The act also established the National Kidney and Urologic Diseases Advisory Board. The law gave parallel special authorities to all Institute operating divisions, including authorization of the National Kidney and Urologic Diseases Information Clearinghouse; National Kidney, Urologic, and Hematologic Diseases Coordinating Committee; National Kidney and Urologic Diseases Data System; National Digestive Diseases Data System; Kidney and Urologic Diseases Research Centers; and Digestive Diseases Research Centers.

June 10, 1993—The NIH Revitalization Act of 1993 (P.L. 103-43) established the NIDDK as the lead Institute in nutritional disorders and obesity, including the formation of a research and training centers program on nutritional disorders and obesity. The act also provided for the directors of the National Institute of Arthritis and Musculoskeletal and Skin Diseases, National Institute on Aging, National Institute of Dental Research, and the NIDDK to expand and intensify research and related programs concerning osteoporosis, Paget's disease, and related bone disorders.

July 25, 1997—A House report accompanying H.R. 2264 and Senate report with S. 1061, FY 1998 appropriations bills for Labor/HHS/Education, urged NIH and NIDDK to establish a diabetes research working group to develop a comprehensive plan for NIH-funded diabetes research that would recommend future initiatives and directions. Dr. C. Ronald Kahn, diabetes research working group chairman, presented "Conquering Diabetes, A Strategic Plan for the 21st Century" to the Congress on March 23, 1999.

August 5, 1997—The Balanced Budget Act of 1997 (P.L. 105-33), as immediately amended by the Taxpayer Relief Act of 1997 (P.L. 105-34), established a *Special Statutory Funding Program for Type 1 Diabetes Research* (now Section 330B of the Public Health Service Act). This legislation provided $30 million per year for FY 1998 through FY 2002. (The program has been extended and has had funding increased in subsequent years.) This funding program augments regularly appropriated funds HHS receives for diabetes research through the Labor-HHS-Education appropriations committees. The NIDDK, through authority granted by the HHS Secretary, has a leadership role in planning, administering, and evaluating the allocation of these funds. In parallel with the *Special Statutory Funding Program for Type 1 Diabetes Research*, P.L. 105-33 also established the *Special Diabetes Program for Indians*, which is administered by the Indian Health Service.

October 17, 2000—Title IV, Section 402 of the Children's Health Act of 2000 (P.L. 106-310) entitled "Reducing the Burden of Diabetes Among Children and Youth" specified that the NIH conduct long-term epidemiology studies, support regional clinical research centers, and provide a national prevention effort relative to type 1 diabetes.

December 21, 2000—The FY 2001 Consolidated Appropriations Act (P.L. 106-554) increased funding for the Special Statutory Funding Program for Type 1 Diabetes Research to $100 million per year for FY 2001 and FY 2002, and extended the program at a level of $100 million for FY 2003.

December 17, 2002—The Public Health Service Act amendment relating to diabetes research (P.L. 107-360) extended and augmented the Special Statutory Funding Program for Type 1 Diabetes Research. The law provided $150 million per year for type 1 diabetes research from FY 2004 through FY 2008.

December 8, 2003—Title VII, Subtitle D, Section 733 of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (P.L. 108-173) authorized the NIDDK to conduct a pancreatic islet transplantation clinical trial that includes Medicare beneficiaries. Medicare would cover routine costs, transplantation, and appropriate related items and services for Medicare beneficiaries enrolled in the trial.

October 25, 2004—The Pancreatic Islet Cell Transplantation Act of 2004 (P.L. 108-362) amended the Public Health Service Act to increase the supply of pancreatic islet cells for research and provide better coordination of federal efforts and information on islet cell transplantation. A provision of this law specified that the annual reports prepared by the NIDDK-led Diabetes Mellitus Interagency Coordinating Committee include an assessment of the federal activities and programs related to pancreatic islet transplantation.

September 2004—The reports accompanying the FY 2005 Senate and House Labor, HHS, and Education appropriations bills (Senate Report 108-345 and House Report 108-636) called on the NIH and HHS to establish a national commission on digestive diseases to develop a long-range research plan. The NIH director subsequently established the National Commission on Digestive Diseases under NIDDK leadership in August 2005.

December 29, 2007—The Medicare, Medicaid, and SCHIP Extension Act of 2007 (P.L. 110-173) extended funding for the Special *Statutory Funding Program for Type 1 Diabetes Research*. The law provided $150 million for type 1 diabetes research in FY 2009.

July 15, 2008—The Medicare Improvements for Patients and Providers Act of 2008 (P.L. 110-275) extended funding for the *Special Statutory Funding Program for Type 1 Diabetes Research*. The law provided $150 million per year for type 1 diabetes research in FY 2010 and FY 2011.

February 17, 2009—President Barack Obama signed the American Recovery and Reinvestment Act (ARRA) of 2009 (P.L. 111-5), providing the NIH with a two-year infusion of funding. The NIDDK developed a plan to use its portion of the ARRA funds to meet the stimulus goals set forth in the Recovery Act. This funding supported a range of biomedical research efforts across the Institute's research mission.

June 15, 2010—H. Res. 1444, a bipartisan resolution recognizing the 60th anniversary of the NIDDK, was introduced.

December 15, 2010—The Medicare and Medicaid Extenders Act of 2010 (P.L. 111-309) extended funding for the *Special Statutory Funding Program for Type 1 Diabetes Research*. The law provided $150 million per year for type 1 diabetes research in FY 2012 and FY 2013.

BIOGRAPHICAL SKETCH OF NIDDK DIRECTOR GRIFFIN P. RODGERS, M.D., M.A.C.P.

Griffin P. Rodgers, M.D., M.A.C.P., was named director of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)—one of the National Institutes of Health (NIH)—on April 1, 2007. Dr. Rodgers had served as the NIDDK's acting director since March 2006 and was the institute's deputy director from 2001-2009. Dr. Rodgers also has been chief of the Molecular and Clinical Hematology Branch since 1998. The branch is now administratively managed by the NIH's National Heart, Lung, and Blood Institute.

Dr. Rodgers received his undergraduate, graduate, and medical degrees from Brown University in Providence, RI. He performed his residency and chief residency in internal medicine at Barnes Hospital and the Washington University School of Medicine in St. Louis. His fellowship training in hematology/oncology was through a joint program of the NIH with George Washington University and the Washington Veterans Administration Medical Center. In addition to his medical and research training, Dr. Rodgers earned a master's degree in business administration, with a focus on the business of medicine, from Johns Hopkins University in 2005.

As a research investigator, Dr. Rodgers is widely recognized for his contributions to the development of the first effective, and now FDA-approved, therapy for sickle cell anemia. He was a principal investigator in clinical trials to develop therapy for patients with sickle cell disease. He also performed basic research that focused on understanding the molecular basis of how certain drugs induce gamma-globin gene expression. Recently, he and his collaborators have reported on a modified blood stem-cell transplant regimen that is highly effective in reversing sickle cell disease in adults and is associated with relatively low toxicity.

Dr. Rodgers has been honored for his research with numerous awards, among them the 1998 Richard and Hinda Rosenthal Foundation Award, the 2000 Arthur S. Flemming Award, the Legacy of Leadership Award in 2002, and a Mastership from the American College of Physicians in 2005.

Dr. Rodgers has been an invited professor at medical schools and hospitals in France, Italy, China, Japan, and Korea. He has been honored with many named lectureships at American medical centers and as commencement speaker at many medical schools. He has published over 200 original research articles, reviews, and

book chapters; has edited four books and monographs; and holds three patents.

Dr. Rodgers served as governor to the American College of Physicians for the Department of Health and Human Services from 1994 to 1997. He is a member of the American Society of Hematology, the American Society of Clinical Investigation, the Association of American Physicians, the Institute of Medicine of the National Academy of Sciences, and the American Academy of Arts and Sciences. He served as chair of the Hematology Subspecialty Board and a member of the American Board of Internal Medicine Board of Directors. Dr. Rodgers is board certified in internal medicine, emergency medicine, and hematology. View Image.

NIDDK DIRECTORS

Name	In Office from	To
William Henry Sebrell, Jr.	August 15, 1950	October 1, 1950
Russell M. Wilder	March 6, 1951	June 30, 1953
Floyd S. Daft	October 1, 1953	May 3, 1962
G. Donald Whedon	November 23, 1962	September 30, 1981
Lester B. Salans	June 17, 1982	June 30, 1984
Mortimer B. Lipsett	January 7, 1985	September 4, 1986
Phillip Gorden	September 5, 1986	November 14, 1999
Allen M. Spiegel	November 15, 1999	March 3, 2006
Griffin P. Rodgers	April 1, 2007	Present

PROGRAMS

Division of Intramural Research

The Division of Intramural Research oversees research and training conducted within the NIDDK's laboratories and clinical facilities by government scientists in Bethesda, MD, and Phoenix, AZ. Several of NIDDK's intramural scientists have received national and international awards for scientific excellence.

The division includes 10 branches, nine laboratories, and four offices, which focus on issues of technology transfer, fellow recruitment and career development, and the overall management of the division's basic and clinical research efforts. In addition, seven core facilities provide centralized scientific support services to the laboratories and branches.

The intramural branches conduct basic, translational, and clinical biomedical research related to diabetes mellitus, endocrine, bone and metabolic diseases; digestive diseases, including liver diseases and nutritional disorders; kidney diseases; and hematologic diseases. The NIDDK's intramural labs are involved in fundamental research in biophysics; cell biology; chemical biology and medicinal chemistry; developmental biology; genetics, pathogenesis, and novel therapies of disease; molecular biology; signal transduction; and structural biology.

Division of Diabetes, Endocrinology and Metabolic Diseases

The Division of Diabetes, Endocrinology, and Metabolic Diseases (DEM) supports research, research training, and career development related to a vast and diverse range of diseases and conditions, including diabetes mellitus, obesity, osteoporosis, cystic fibrosis, thyroid and other endocrine disorders, and metabolic diseases. The division also leads the administration of trans-NIH diabetes research; coordinates federally supported, diabetes-related activities; promotes public awareness and education about diabetes and other diseases; and collects and disseminates data.

Diabetes Research Programs

The division encompasses 25 diabetes research programs:

- Adipocyte Biology Research Program
- Autoimmunity/Viral Etiology of Type 1 Diabetes Research Program
- Behavioral/Prevention Research Program
- Beta Cell Therapy Research Program
- Clinical Islet Transplantation Consortium Program
- Clinical Research in Type 2 Diabetes Program
- Complications of Diabetes Research Program
- Developmental Biology Research Program

- Diabetes Centers Program
- Drug Discovery Program
- Endocrine Pancreas Research Program
- Environmental Determinants of Diabetes in the Young (TEDDY)
- Genetics of Type 1 Diabetes Research Program
- Genetics of Type 2 Diabetes Research Program
- Glucose Sensors Research Program
- Hypoglycemia in Diabetes Research Program
- Insulin Receptor/Structure/Function/Action Research Program
- Islet Transplantation Research Program
- Molecular and Functional Imaging Program
- Mouse Metabolic Phenotyping Program
- Pharmacogenetics and Personalized Medicine in the Treatment of Diabetes
- Prevention of Type 1 Diabetes Research Program
- Type 1 Diabetes Clinical Trials Program
- Type 2 Diabetes Clinical Trials Program
- Type 2 Diabetes in the Pediatric Population Research Program

Endocrinology Research Programs

The division encompasses seven endocrinology research programs, including the

- Bone and Mineral Metabolism Research Program
- G-Protein Coupled Receptors Program
- Integrative Biology of Obesity Program
- Signaling and Nutrient Sensing
- Neuroendocrinology Research Program
- Nuclear Receptor Superfamily Program
- Neurobiology of Obesity Program

Metabolic Diseases Research Programs

The division encompasses 12 metabolic diseases research programs:

- Cystic Fibrosis Research Program
- Functional Metabolomics Program
- Gene Therapy and Cystic Fibrosis Centers Program
- Gene Therapy Research Program
- Genomic Resource and Technology Development Program
- Inborn Errors of Metabolism Research Program
- Integrative Metabolism and Insulin Resistance Program
- Intrauterine Environment
- Metabolic Imprinting
- Metabolomics Technology Development Roadmap Program
- Protein Trafficking/Secretion/Processing Research Program
- Proteomics in Diabetes, Endocrinology, and Metabolic Diseases Program

Diabetes Mellitus Interagency Coordinating Committee

The Diabetes Mellitus Interagency Coordinating Committee (DMICC) coordinates diabetes research and activities across the NIH and other federal programs. The division director chairs the DMICC, which includes representatives from all federal departments and agencies whose programs involve health functions and responsibilities relevant to diabetes and its complications.

National Diabetes Data Group

The DEM's National Diabetes Data Group serves as the federal lead for collecting, analyzing, and sharing data on diabetes and its complications. The group draws on the expertise of the research, medical, and lay communities to support its data initiatives.

National Diabetes Education Program

See "Health Information and Education Services."

Division of Digestive Diseases and Nutrition

The Division of Digestive Diseases and Nutrition (DDN) supports research related to digestive diseases, including the alimentary tract, liver and pancreas, nutrition and obesity. The programs include basic, translational and clinical research. DDN also promotes public awareness and education about digestive diseases and related conditions, and oversees several national public awareness campaigns.

Digestive Diseases Research Programs

Alimentary tract programs

- Basic Neurogastroenterology
- Clinical Trials in Digestive Diseases
- Gastrointestinal and Nutrition AIDS
- Gastrointestinal Development
- Gastrointestinal Epithelial Biology
- Gastrointestinal Host-microbial Interactions
- Gastrointestinal Inflammation
- Gastrointestinal Motility
- Gastrointestinal Mucosal Inflammation and Immunology
- Gastrointestinal Transport and Absorption
- Gastroparesis Consortium
- Genetics and Genomics of the Gastrointestinal Tract and its Diseases

Liver Disease Research Programs

- Acute Liver Failure
- Autoimmune Liver Disease
- Bile, Bilirubin and Cholestasis
- Bioengineering and Biotechnology
- Cell and Molecular Biology of the Liver
- Childhood Liver Disease Network
- Clinical Trials in Liver Disease
- Complications of Chronic Liver Disease
- Developmental Biology and Regeneration
- Drug-induced Liver Disease
- Fatty Liver Disease
- Gallbladder Disease and Biliary Diseases
- Genetic Liver Disease
- Genetics and Genomics of Liver/Pancreas Diseases
- Hepatitis B
- HIV and Liver
- Liver Cancer
- Liver Cell Injury, Repair, Fibrosis and Inflammation
- Liver Transplantation
- Nonacoholic Steatohepatitis Network
- Pediatric Acute Liver Failure
- Pediatric Liver Disease

- Viral Hepatitis and Infectious Diseases

Pancreas Research Programs

- Gastrointestinal Neuroendocrinology
- Pancreas Research
- Study of Nutrition in Acute Pancreatitis

Obesity Research Programs

- Bariatric Surgery Clinical Research Consortium
- Clinical Obesity and Nutrition
- Genetics and Genomics of Obesity
- Lifestyle Interventions in Obese Pregnant Women
- Obesity and Eating Disorders
- Obesity Prevention and Treatment
- Pediatric Clinical Obesity
- Look AHEAD (Action for Health in Diabetes)

Nutrition Sciences Research Programs

- Clinical Obesity and Nutrition
- Clinical Trials in Nutrition
- Genetics and Genomics of Nutrition
- Nutritional Epidemiology and Data Systems
- Nutrient Metabolism

Cross-cutting programs

- Career Development (K Awards)
- Digestive Diseases Epidemiology and Data Systems
- Digestive Diseases Research Core Centers
- Individual Research Fellowship
- Loan Repayment
- Nutrition Obesity Research Centers
- Small Business Program
- Institutional Training Grants (T32s)

The division oversees health education and awareness campaigns:

- Celiac Disease Awareness Campaign
- Ways to Enhance Children's Activity and Nutrition (We Can!)
- Weight-control Information Network
- Bowel Control Awareness Campaign

For more information about these initiatives, see "Health Information and Education Services."

Division of Kidney, Urologic, and Hematologic Diseases

The Division of Kidney, Urologic, and Hematologic (KUH) Diseases provides research funding and support for basic, translational, and clinical research studies of the kidney, urinary tract, and disorders of the blood and blood-forming organs. The division also provides funding for training and career development of people committed to academic and clinical research in these areas.

Kidney Diseases Research Programs

The division encompasses research programs related to kidney research, including

- Acute Kidney Injury
- Basic Kidney Biology

- Chronic Kidney Disease
- Developmental Biology of the Kidney
- Diabetic Kidney Disease
- End-Stage Renal Disease
- Genetics and Genomics
- Inflammatory Kidney Disease
- Kidney HIV/AIDS
- Pediatric Kidney Disease
- Polycystic Kidney Disease
- Renal Diseases Epidemiology
- U.S. Renal Data System (USRDS)

Urological Diseases Research Programs

The division encompasses research programs related to urology research, including

- Basic Cell Biology of the Bladder and Prostate
- Developmental Biology of the Urogenital Tract
- Genetics and Genomics of Urology
- Pediatric Urology
- Urologic Diseases Epidemiology
- Urology Basic Science
- Urology Clinical Science
- Urology HIV/AIDS
- Urology Technology Development
- Urology Women's Health Studies
- Urologic Diseases in America Epidemiology Program

Hematology Research Programs

The division encompasses research programs related to hematology research, including the

- Basic and Translational Hematology Research
- Erythropoiesis and Hemoglobin
- Genetic and Genomic Hematology Research
- Hematology HIV/AIDS
- Hematopoiesis and Hematopoietic Stem Cell Biology
- Heme-Net program
- Iron and Heme Metabolism, Iron Chelation
- Stimulating Hematology Investigation: New Endeavors (SHINE) program

The division oversees the following health education and awareness campaigns:

- Bladder Control for Women
- National Kidney Disease Education Program

For more information about these initiatives, see "Health Information and Education Services."

Division of Extramural Activities

The Division of Extramural Activities (DEA) provides leadership, oversight, tools, and guidance to manage the NIDDK's grants policies and operations, including efforts related to the scientific peer review process for assessing grant applications. The DEA also coordinates the NIDDK's committee management activities and Advisory Council meetings, and performs and coordinates programmatic analyses and evaluation activities.

The DEA is organized into three primary components:

- the **Grants Management Branch**, the focal point for all business-related activities associated with the negotiation, award, and administration of grants and cooperative agreements within the NIDDK
- the **Scientific Review Branch**, which coordinates the initial scientific peer review of applications submitted in response to Request for Applications (RFAs), training and career awards, program projects, multi-center clinical trials, and research contracts, including Loan Repayment Program applications. Most R01s, fellowship, and SBIR grant applications are reviewed in the Center for Scientific Review.
- the **Office of Research Evaluation and Operations** (OREO), within the DEA Office of the Director, oversees and coordinates disease coding/reporting for the NIDDK extramural program, manages the Early Notification System and NIH Guide publication process associated with NIDDK Funding Opportunity Announcements, and supports NIDDK Advisory Council activities. The office also facilitates harmonization of activities among NIDDK's four extramural divisions and coordinates or performs special projects at the request of the NIDDK leadership.

NIDDK Office of the Director

Office of Minority Health Research Coordination

The NIDDK director created the Office of Minority Health Research Coordination **(OMHRC)** to address diseases and disorders that disproportionately affect minority populations. The OMHRC helps implement the Institute's strategic plan for health disparities and build on the strong partnership with the National Institute on Minority Health and Health Disparities at the NIH.

Among many other initiatives designed to diversify the biomedical research field, OMHRC manages the Intramural Summer Internship Program for Underrepresented Groups, and the extramural Short-Term Education Program for Underrepresented Persons (STEP-UP). The two programs are designed to provide summer research opportunities for students from groups underrepresented in biomedical research. View Image.

Office of Obesity Research

The NIDDK Office of Obesity Research coordinates obesity-related research within the NIDDK and carries out its functions through the NIDDK Obesity Research Working Group. The co-directors represent the two divisions primarily responsible for obesity-related extramural research: DDN and DEM.

The Obesity Research Working Group includes representatives of DDN, DEM, KUH, the NIDDK Review Branch, the Office of Scientific Program and Policy Analysis (OSPPA), the Office of Communications and Public Liaison (OCPL), and the NIH Division of Nutrition Research Coordination (DNRC). The working group

- provides a forum for sharing and coordinating trans-NIDDK and trans-NIH obesity research activities
- helps the NIDDK director identify research opportunities, initiatives, and advances
- identifies and plans workshops and conferences
- prepares obesity-related reports and inquiries

The NIDDK Clinical Obesity Research Panel (CORP) is the successor to the National Task Force on Prevention and Treatment of Obesity. The NIDDK CORP, composed of leading obesity researchers and clinicians, is charged with providing advice to the NIDDK Advisory Council on important clinical research needs related to obesity prevention and treatment, including their relative priority and costs, and identifies concepts for future clinical studies of obesity. The CORP serves in an advisory capacity to the Weight-control Information Network. The CORP is placed organizationally under the auspices of the NIDDK Advisory Council.

Health Information and Education Services

NIDDK Clearinghouses

The NIDDK operates three clearinghouses that provide information about diabetes, digestive diseases, and kidney and urologic diseases to patients, their families, health professionals, and the general public:

- the National Diabetes Information Clearinghouse (NDIC)
- the National Digestive Diseases Information Clearinghouse (NDDIC)
- the National Kidney and Urologic Diseases Information Clearinghouse (NKUDIC)

Each clearinghouse was authorized by Congress to increase knowledge and understanding about these areas by disseminating information.

The clearinghouses launched two additional information services in 2004 to focus on additional NIDDK-related conditions such as hormone and blood disorders:

- the National Endocrine and Metabolic Diseases Information Service
- the National Hematologic Diseases Information Service.

The clearinghouses and information services translate science into easy-to-understand information for the public. They provide print and online information and resources for patients, the public, and health professionals, including many easy-to-read publications available in several languages and in large print. The clearinghouses answer inquiries and work closely with professional and patient-advocacy organizations and U.S. government agencies to coordinate resources on relevant topics.

NIDDK Public Awareness Campaigns

The clearinghouses also manage three public awareness campaigns directed at conditions that are frequently underdiagnosed or untreated:

The Celiac Disease Awareness Campaign promotes public awareness about the symptoms, diagnosis, and treatment of celiac disease. The NDDIC-based campaign provides current, comprehensive, science-based information about the disease, including news, e-blasts, feature stories, educational materials and resources, practice guidelines, and contacts for patient-advocacy and not-for-profit organizations devoted to celiac disease awareness.

The NDDIC's "Let's Talk about Bowel Control" awareness campaign provides resources to health care providers and the public about how to talk about and manage problems with bowel control. Resources include news, information about research and clinical trials, fact sheets, online tools, and links to other organizations.

To raise awareness about the common but infrequently discussed problem of urinary incontinence, the NKUDIC created the "Bladder Control for Women" awareness campaign, which promotes resources to help women understand the condition and talk about it with their doctors. A booklet, fact sheets, online diary, poster, and other resources are available from the campaign.

NIDDK Education Programs

National Diabetes Education Program

The National Diabetes Education Program (NDEP), co-sponsored by the NIDDK and the CDC, brings together public and private partners in efforts to improve diabetes management and outcomes, promote early diagnoses, and prevent or delay the onset of diabetes in the U.S. and its territories. The NDEP translates the latest evidence-based science into education campaigns and related activities for people with diabetes and their families, people at risk for type 2 diabetes, health care providers, policymakers, and payers of health care costs.

National Kidney Disease Education Program

The National Kidney Disease Education Program (NKDEP) is a National Institutes of Health initiative designed to reduce morbidity and mortality caused by kidney disease and its complications among communities most affected by kidney failure, including African Americans, Hispanics, and Native Americans. NKDEP aims to improve early detection of chronic kidney disease (CKD), slow the progression of CKD, promote evidence-based interventions, and support the coordination of Federal responses to CKD. A variety of materials is available for laboratory and health care professionals, people with kidney disease and their families, and the general public. Resources include fact sheets, data, reports, brochures, online tools and videos.

Ways to Enhance Children's Activity and Nutrition (We Can!)

The national We Can! campaign supports parents, caregivers, and entire communities in helping children 8 to 13 years old maintain a healthy weight. Four institutes of the NIH have come together to develop the program: The National Heart, Lung, and Blood Institute; in collaboration with NIDDK; the National Cancer Institute; and the Eunice Kennedy Shriver National Institute of Child Health and Human Development. The program offers organizations, community groups, and health professionals a centralized resource to promote healthy weight through community outreach, partnership development, and media activities. Science-based educational programs, parent resources, community training opportunities, and other materials and tools are available to support programming for youth, parents, and families in the community.

Weight-control Information Network

The Weight-control Information Network (WIN) creates and disseminates to the public, patients, health professionals and media up-to-date, science-based information on weight control, obesity, physical activity, and related nutritional issues. An e-newsletter, research, brochures, fact sheets, and other resources are available through WIN.

This page last reviewed on April 17, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Recent Photos from the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)

2012 PHOTOS

Dr. Thomas E. Starzl, winner of a 2012 Lasker award for his pioneering efforts in organ transplantation, is congratulated by NIDDK Director Dr. Griffin P. Rodgers at the Lasker Awards ceremony on Sept. 21, 2012. Photo credit: Ellen Jaffe.
lo-res | hi-res

Dr. On June 12, 2012, U.S. Department of Health and Human Services Secretary Kathleen Sebelius (center) and India's Honorable Ghulam Nabi Azad, Minister of Health and Family Welfare (second from right), signed a joint statement on collaboration on diabetes research. They were witnessed by Dr. Griffin P. Rodgers, director of the National Institute of Diabetes and Digestive and Kidney Diseases (left), Dr. V.M. Katoch, Secretary of India's Department of Health Research and Director-General, Indian Council of Medical Research (second from left), and the Honorable Krishna Tirath, India's Minister of State for Women and Child Development (right). Photo credit: Chris Smith, HHS.
lo-res | hi-res

2011 PHOTOS

Three former directors of NIDDK join current NIDDK Director Dr. Griffin P. Rodgers (second from left) at the Institute's 60th anniversary symposium, "Unlocking the Secrets of Science: Building the Foundation for Future Advances," held on Sept. 21 at the NIH Natcher Conference Center in Bethesda. At left, former directors Dr. Lester B. Salans, now a professor at Mount Sinai Medical School and director of Forest Laboratories; second from right, Dr. Phillip Gorden, now an NIDDK intramural researcher and; at right, Dr. Allen M. Spiegel, dean of the Albert Einstein College of Medicine.
lo-res | hi-res

Dr. Jeffrey Friedman, an investigator in the Howard Hughes Medical Institute at Rockefeller University and NIDDK grantee, presents on "The New Biology of Obesity"—including his Lasker Award-winning research on the hormone leptin—on Sept. 21 at the NIDDK 60th anniversary symposium, held on the NIH's Bethesda campus.
lo-res | hi-res

Photo of NIDDK Director Griffin P. Rodgers, M.D., M.A.C.P.
lo-res | hi-res

Participants of the 2011 Short-Term Education Program for Underrepresented Persons, or STEP-UP, gather on the NIH campus in Bethesda, Md., for a research symposium on their work. The program is part of NIDDK's Office of Minority Health Research Coordination.
lo-res | hi-res

This page last reviewed on February 1, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

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National Institutes of Health
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National Institute on Drug Abuse

Mission | Important Events | Legislative Chronology | Director | Divisions and Offices | Photo Gallery

MISSION

The mission of the National Institute on Drug Abuse (NIDA) is to lead the Nation in bringing the power of science to bear on drug abuse and addiction. In this regard, NIDA addresses the most fundamental and essential questions about drug abuse—from detecting and responding to emerging drug abuse trends and understanding how drugs work in the brain and body, to developing and testing new approaches to treatment and prevention. NIDA also supports research training, career development, public education, public-private partnerships, and research dissemination efforts. Through its Intramural Research Program, as well as grants and contracts to investigators at research institutions around the country and overseas, NIDA supports research and training on:

- The genetic, neurobiological, behavioral, and social mechanisms underlying drug abuse and addiction;
- The causes and consequences of drug abuse, including the impact on society and morbidity and mortality in selected populations (e.g., ethnic minorities, youth, and women);
- The relationship of drug abuse to other mental illnesses and to psychosocial outcomes such as unemployment, low socioeconomic status, and violence;
- Effective prevention and treatment approaches, including a broad research program designed to develop new medications and behavioral therapies for drug addiction;
- The relationship of drug abuse to cultural and ethical issues such as health disparities; and
- The relationship of drug abuse to the acquisition, transmission, and clinical course of HIV/AIDS, hepatitis C, and other diseases, as well as the development of effective prevention/intervention strategies.

IMPORTANT EVENTS IN NIDA HISTORY

1935—A research facility is established in Lexington, KY, as part of a U.S. Public Health Service (USPHS) hospital. It became the Addiction Research Center in 1948.

1972—Drug Abuse Warning Network and National Household Survey on Drug Abuse are initiated under the Special Action Office for Drug Abuse Prevention.

1974—NIDA is established as the Federal focal point for research, treatment, prevention, training, services, and data collection on the nature and extent of drug abuse.

National Drug and Alcohol Treatment Unit Survey begins to identify the location, scope, and characteristics of public and private drug prevention and treatment programs.

1975—The Monitoring the Future Survey, also known as the High School Senior Survey, is initiated to measure prevalence and trends of non-medical drug use and related attitudes of high school seniors and young adults.

NIDA begins its "Research Monograph Series." Each monograph contains scientific papers that discuss a variety of subjects, including drug abuse treatment and prevention research.

1976—NIDA establishes the Community Epidemiology Work Group, made up of state and local representatives meeting semiannually with NIDA staff to assess recent drug abuse trends and to identify populations at risk.

1979—The clinical research program moves from Lexington, KY, to the campus of the Francis Scott Key Medical Center (later Johns Hopkins Bayview Medical Center) in Baltimore, MD. The basic science program follows in 1985.

NIDA sponsors the Treatment Outcome Prospective Study (TOPS), which continues through 1987 to evaluate the overall effectiveness of treatment and to identify certain factors as important determinants of drug abuse treatment success, such as length of time in treatment.

1985—NIDA publishes the first issue of its bimonthly newsletter, *NIDA Notes*.

1986—The dual epidemics of drug abuse and HIV/AIDS are recognized by Congress and the Administration, resulting in a quadrupling of NIDA funding for research on both major diseases.

1987—NIDA initiates the National AIDS Demonstration Research projects to study and change the high-risk behaviors of injection drug users not enrolled in drug treatment and their sex partners.

1990—NIDA establishes the Medications Development Program, focusing on developing new medications for treating addiction.

1991—The Monitoring the Future Survey is expanded to include 8th and 10th graders.

NIDA begins data collection for the Drug Abuse Treatment Outcome Study (the successor to TOPS) to assess the effectiveness of treatment in reducing drug abuse and to identify predictors of drug abuse treatment success.

NIDA holds its first research technology transfer conference in Washington, DC: "National Conference on Drug Abuse Research and Practice: An Alliance for the 21st Century."

1992—NIDA joins the National Institutes of Health (NIH).

1993—The Institute obtains approval from the U.S. Food and Drug Administration (FDA) for levomethadyl acetate (LAAM), the first medication approved in a decade for the treatment of opioid addiction. Although the FDA approval was an important milestone in medications development, subsequent findings revealed more effective treatment options for opioid abuse, resulting in a consensus that the use of LAAM should be discontinued.

1995—NIDA researchers clone the dopamine transporter, cocaine's primary site of action in the brain.

The Institute holds the first "National Conference on Marijuana Use: Prevention, Treatment, and Research" in Arlington, VA.

1996—NIDA dedicates the Regional Brain Imaging Center located at the Institute's intramural research center in Baltimore.

1997—NIDA releases *Preventing Drug Use Among Children and Adolescents: A Research-Based Guide*, which describes the most successful concepts for preventing drug abuse among young people.

The Institute sponsors "Heroin Use and Addiction: A National Conference on Prevention, Treatment, and Research," in Washington, DC.

In partnership with the Entertainment Industries Council (EIC), NIDA launches the annual PRISM awards for accurate depiction of drugs, alcohol, and tobacco in feature films and television productions.

1998—NIDA launches the "NIDA Goes to School" initiative to provide middle school students with accurate information on how drugs affect the brain. As a part of this initiative, more than 18,000 middle schools across the country received a compilation of resource materials.

1999—In collaboration with the National Cancer Institute (NCI) and the Robert Wood Johnson Foundation, NIDA creates the Transdisciplinary Tobacco Use Research Centers for studying tobacco use and new ways to combat it and its consequences.

NIDA launches its National Drug Abuse Treatment Clinical Trials Network to rapidly and efficiently test the effectiveness of behavioral and pharmacological treatments in real-world treatment settings.

NIDA releases *Principles of Drug Addiction Treatment: A Research-Based Guide*, developed for use in local communities. The guide describes the most successful concepts for treating people with drug abuse and addiction problems.

2000—NIDA distributes its "Clinical Toolbox," a collection of the latest comprehensive, science-based publications on drug addiction and its treatment.

2001—The Institute launches the National Prevention Research Initiative to stimulate research that will fill critical gaps in the knowledge and use of science-based drug abuse prevention strategies in communities across the country.

2002—The Institute launches the new peer-reviewed journal *Science and Practice Perspectives* to encourage more collaboration between researchers and practitioners.

The FDA approves buprenorphine for the treatment of opioid dependence. NIDA, in collaboration with the pharmaceutical industry, supported the development of this medication, which can be prescribed in a physician's office. This is a watershed event in the treatment of chronic opioid addiction, which previously required daily visits to specialized clinics for methadone dispensing.

With support from eight partner agencies in the U.S. Department of Health and Human Services (HHS) and the Department of Justice, NIDA launches a major research initiative called the Criminal Justice Drug Abuse Treatment Studies (CJ-DATS). The goal of CJ-DATS is to establish a research infrastructure to develop and test models for an integrated approach to the treatment of incarcerated individuals with drug abuse or addictive disorders.

NIDA releases a new elementary school curriculum, *Brain Power! The NIDA Junior Scientist Program*, for use in second- and third-grade classrooms.

NIDA teams with Scholastic, a leading provider of educational materials for children and teachers, in launching a project to bring science-based information about

drug abuse to millions of U.S. school children.

NIDA releases *Principles of HIV Prevention in Drug-Using Populations: A Research-Based Guide* to help communities prevent the spread of HIV.

2003—NIDA releases its newly updated publication, *Preventing Drug Use among Children and Adolescents: A Research-Based Guide for Parents, Educators, and Community Leaders, Second Edition*, which reflects NIDA's expanded research program and knowledge base in the area of drug abuse prevention.

NIDA launches its "NIDA Goes Back to School" campaign and "NIDA for Teens" website in an effort to keep parents, teachers, and teenagers informed about the science behind drug abuse.

NIDA seeks to address the gap that exists in the drug abuse treatment field between clinical practice and basic scientific investigation through the establishment of its "Blending" series of meetings. The 2003 meeting was titled "Blending Clinical Practice and Research: Forging Partnerships in the Rocky Mountain States to Enhance Drug Addiction Treatment."

2004—NIDA collaborates with the Drug Enforcement Administration and other Federal agencies to design a traveling museum exhibit, which debuted in New York City. This exhibit draws attention to the social, economic, and medical consequences associated with drug abuse.

2005—NIDA expands efforts to understand how drugs of abuse influence brain development through new research initiatives and collaborations with other NIH Institutes on pediatric neuroimaging studies.

NIDA launches an HIV/AIDS campaign to raise awareness regarding the link between drug abuse and HIV transmission. As a part of this effort, NIDA develops a public service announcement that is aired across the Nation and displayed in Washington DC's Metro system. NIDA also develops a dedicated website, creates a "Research Report," and holds a scientific meeting on drug abuse and HIV/AIDS. A Spanish version of the public service announcement is developed for distribution the following year.

2006—NIDA launches its *Principles of Drug Abuse Treatment for Criminal Justice Populations: A Research-Based Guide*, summarizing proven components for successfully treating drug abusers who have entered the criminal justice system.

2007—NIDA, in collaboration with the Substance Abuse and Mental Health Services Administration (SAMHSA), releases five Blending Team products to facilitate the adoption of effective research-based treatment by community practitioners. Products include education and training materials on: treatment protocols using buprenorphine, motivational interviewing, motivational incentives, and the Addiction Severity Index for treatment planning.

NIDA releases its first plain-language booklet explaining the science behind addiction. *Drugs, Brains, & Behavior—The Science of Addiction* discusses the reasons people take drugs, why some people become addicted while others do not, how drugs work in the brain, and how addiction can be prevented and treated. View Image.

NIDA joins with the Robert Wood Johnson Foundation, the National Institute on Alcohol Abuse and Alcoholism (NIAAA), and HBO to produce the Emmy Award-winning documentary titled "Addiction," which explores many elements of drug and alcohol addiction through the eyes of those who are addicted and features the insights of scientific experts working to better understand and treat this devastating disease.

NIDA holds the first national "Drug Facts Chat Day." High school students in schools from 49 states, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam submitted over 36,000 questions on a wide range of drug abuse-related topics. View Images.

2008—NIDA launches its Avant-Garde Award to support HIV/AIDS-focused investigators of exceptional creativity who propose bold and highly innovative research approaches that have the potential to produce a major impact on treatment and/or prevention

NIDA launches the first annual Addiction Science award, with Scholastic as co-sponsor (and in subsequent years with Friends of NIDA), at the Intel International Science and Engineering Fair (ISEF), the world's largest science competition for high school students. Three Addiction Science awards were given to talented high school scientists to foster their interest in addiction research.

2009—NIDA launches a comprehensive Physicians Outreach Initiative, NIDAMED, which gives medical professionals tools and resources to screen their patients for tobacco, alcohol, illicit, and nonmedical prescription drug use, including an interactive online drug abuse screening tool—the NIDA-modified ASSIST.

NIDA unveils a series of new teaching tools, through its Centers of Excellence for Physician Information Program (NIDA CoEs). The new NIDA CoE curriculum resources provide scientifically accurate information on substance abuse, addiction and its consequences to help meet the educational needs of medical students, residents and medical school faculty.

NIDA sponsors a virtual town hall meeting, bringing together representatives from key federal agencies involved in preventing and combating substance abuse in the United States. Participants were linked via satellite from Washington, DC, to Camden, Maine, where members of five local communities, as well as community leaders from Freeport, Illinois, and Quincy, Washington, talked about their success in implementing the Communities That Care (CTC) system aimed at keeping youth safe from drugs.

NIDA-funded research, published in the October issue of *Archives of General Psychiatry*, shows promise for treating cocaine addiction. The study is the first successful, placebo-controlled demonstration of a vaccine against an illicit drug of abuse.

NIDA's director, Dr. Nora Volkow, was awarded the International Prize from the French Institute of Health and Medical Research (INSERM) for her pioneering work in brain imaging and addiction science.

2010— NIDA collaborates with the Department of Veteran Affairs and two NIH institutes to award 11 research institutions in 11 states more than $6 million in federal funding to support research on substance abuse and associated problems among U.S. military personnel, veterans, and their families.

NIDA launches its Avant-Garde Medications Development Research Award designed to support researchers whose innovative approaches could have a major impact on the development of addiction medications. The newly launched research competition is an extension of NIDA's successful Avant-Garde Award for Innovative HIV/AIDS Research.

Two developments in the treatment of opioid addiction herald important advances for addressing this worldwide epidemic: The FDA approves Vivitrol, a long-acting injectable form of naltrexone, for opioid dependence, which could address compliance issues of oral naltrexone by allowing for once a month dosing. Similarly, a study reported in the *Journal of the American Medical Association* shows promising findings for a long-acting implantable formulation of buprenorphine (Probuphine). NIDA is supporting further research on the clinical efficacy of Probuphine.

NIDA launches three new curriculum resources for NIDAMED's Centers of Excellence for Physician Information Program: an objective structured clinical exam on opioid risk management; a lecture presentation on how to talk to patients about sensitive subjects, including drug/alcohol abuse, intimate partner violence, and sexual history/concerns; and a methamphetamine lecture and interclerkship that introduces learners to methamphetamine abuse and dependence.

NIDA launches its first annual National Drug Facts Week (NDFW), a health observance week for teens aimed to shatter the myths about drugs. Through community-based events around the country and activities on the Web, on TV and through music, NIDA encouraged teens to get factual answers from scientific experts about drugs and drug abuse. Efforts included a collaboration with MusiCares® and the GRAMMY Foundation® to create the Teen Substance Abuse Awareness through Music Contest; the development of a new booklet *Drug Facts: Shatter the Myths*, a National IQ Challenge Quiz, as well as numerous media outreach efforts that reached millions nationwide.

NIDA launches pages on Facebook and Twitter, two widely viewed social networking websites. NIDA posts on both platforms highlight a variety of topics, including press releases, program initiatives, drug facts, research updates and other news of interest.

2011—The U.S. Food and Drug Administration and the National Institutes of Health announce a joint, large-scale, national study of tobacco use to monitor and assess the behavioral and health impacts of new government tobacco regulations. The initiative, called The Population Assessment of Tobacco and Health (PATH) Study will follow more than 40,000 people with a focus on users of tobacco-products and those at risk for tobacco product use ages 12 and older in the United States.

NIDA launches the Addiction Performance Project (APP), a CME & CE program to help break down the stigma associated with addiction and promote a healthy dialogue that fosters compassion, cooperation, and understanding for patients living with this disease. This project is part of NIDA's outreach to practicing health professionals and those in training. Each performance begins with a dramatic reading of Act III of Eugene O'Neill's Long Day's Journey into Night by award-winning professional actors, followed by a brief expert panel reaction and facilitated audience discussion. Lead actresses have Debra Winger, Blythe Danner, Dianne Wiest, and Kathryn Erbe. The APP performances appeared in Washington, DC; Phoenix, AZ; Boston, MA; Denver, Co; Chicago, Il, and Philadelphia, PA.View Image.

NIDA, along with the American Society of Addiction Medicine (ASAM), launches a free, nationwide service to help primary care providers seeking to identify and advise substance-abusing patients. The service, Physician Clinical Support System for Primary Care (PCSS-P), offers peer-to-peer mentorship and resources on incorporating screening and follow-up into regular patient care. NIDA also launches the NIDA Quick Screen, a single question screening tool, to facilitate screening for drug use in primary care settings. Both tools are part of the NIDAMED program. View Image.

NIDA launches PEERx, an updated prescription drug section on its teen Web site for teens to find interactive videos and other tools that help them make decisions about abusing prescription drugs based on real life situations they encounter at school and in life.

NIDA's award-winning peer-reviewed journal, *Addiction Science & Clinical Practice (AS&CP),* moves to Biomed Central (BMC), but remains available on the web at no charge. NIDA's news and analysis of research findings in its bi-monthly *NIDA Notes* is also transitioned to an all web format.

2012—NIDA launches *Family Checkup*, an online resource that equips parents with research-based skills to help keep their children drug-free.

To address the complex problem of prescription opioid abuse, NIDA, in partnership with the Office of National Drug Control Policy and Medscape, launches online continuing medical education (CME) courses for health care providers on proper prescribing and patient management practices for opioid analgesics (painkillers). The CME courses, which include video vignettes modeling doctor-patient conversations on the safe and effective use of opioid pain medications, are part of NIDA's NIDAMED initiative, created to help physicians, medical interns and residents, and other clinicians understand and address substance abuse in their practices. To broaden the use of the NIDAMED tools and resources, NIDA's drug use screening tool was modified to be fully accessible from mobile devices.

NIDA launches an easy-to-read website on drug abuse designed for adults with a low reading literacy level (eighth grade or below), which provides plain language information on neuroscience, drug abuse, and prevention and treatment, and is also a resource for adult literacy educators.

NIDA launches a new publication, *Seeking Drug Abuse Treatment: Know What to Ask*, to help individuals and families struggling with addiction to ask the right questions before choosing a drug treatment program.

NIDA LEGISLATIVE CHRONOLOGY

1966—P.L. 89-793, the Narcotic Addict Rehabilitation Act, provided for increased Federal efforts in the rehabilitation and treatment of narcotic addicts (limited to opiate abusers).

1970—P.L. 91-513, the Comprehensive Drug Abuse Prevention and Control Act, replaced the USPHS Act's definition of "narcotic addict" with a definition of "drug

dependent person" to authorize treatment for both narcotic addicts and other persons with drug abuse problems.

1972—P.L. 92-255, the Drug Abuse Office and Treatment Act, created a Special Action Office for Drug Abuse Prevention (SAODAP) in the Executive Office of the President, and authorized the establishment of NIDA within the Department to become operational in 1974. In cooperation with other Federal agencies, especially the National Institute of Mental Health's (NIMH) Division of Narcotic Addiction and Drug Abuse (DNADA), SAODAP established a national network of multi-modality drug abuse treatment programs.

1974—P.L. 93-282, the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment, and Rehabilitation Act Amendments, created the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA), which was charged with supervising and coordinating the functions of NIMH, NIDA, and NIAAA. Programs and responsibilities of DNADA and SAODAP were moved to NIDA.

1979—P.L. 96-181, the Drug Abuse Prevention, Rehabilitation, and Treatment Act, mandated that at least 7% in FY 1980 and 10% in FY 1981 of NIDA's Community Programs budget be spent on prevention.

1981—P.L. 97-35, the Omnibus Budget Reconciliation Act, repealed NIDA's formula grants and Community Programs project grants and contracts authorities, and established the Alcohol, Drug Abuse, and Mental Health Services (ADMS) Block Grant program, giving more control of treatment and prevention services to the states.

1986—P.L. 99-570, the Anti-Drug Abuse Act of 1986, increased the Block Grant and created a substance abuse treatment enhancement. The Act also provided increased funds for all NIDA research, particularly AIDS research.

Executive Order 12564 mandated a drug-free Federal workplace program. NIDA became the lead agency, creating its Office of Workplace Initiatives.

1987—P.L. 100-71, Supplemental Appropriations Act of 1987, required HHS (NIDA) to publish guidelines in the Federal Register for Federal drug testing.

1988—P.L. 100-690, the Anti-Drug Abuse Act of 1988, established the Office of National Drug Control Policy (ONDCP) in the Executive Office of the President and authorized funds for Federal, state, and local law enforcement, school-based drug prevention efforts, and drug abuse treatment with special emphasis on injection drug abusers at high risk for AIDS.

1989 and **1990**—P.L. 101-166 and P.L. 101-517, the Departments of Labor, HHS, and Education Appropriations Acts for FY 1990 and 1991, contained identical prohibitions precluding the use of funds provided under these enactments to carry out any program of distributing sterile needles.

1992—P.L. 102-321, the ADAMHA Reorganization Act, transferred NIDA to NIH; earmarked 15% of the Institute's research appropriation for health services research; established a Medication Development Program within NIDA; provided authority to designate Drug Abuse Research Centers for interdisciplinary research on drug abuse and related biomedical, behavioral, and social issues; and created an Office on AIDS at NIDA.

P.L. 102-394, the Departments of Labor, HHS, and Education FY 1993 Appropriations Act, provided that up to $2 million of NIDA research funds be available to carry out section 706 of P.L. 102-321, which required the HHS Secretary, acting through NIDA, to request a National Academy of Sciences study of U.S. programs that provide both sterile hypodermic needles and bleach.

1993—P.L. 103-112, the Department of Labor, HHS and Education FY 1994 Appropriations Act, prohibited the use of funds under the Act for any further implementation of section 706 of P.L. 102-321 (see above) and any program for distributing sterile needles.

1994 and **1996**—P.L. 103-333, the Departments of Labor, HHS, and Education Appropriations Act for FY 1995; P.L. 104-134, the Omnibus Consolidated Rescissions and Appropriations Act for FY 1996; and P.L. 104-208, the Omnibus Consolidated Appropriations Act for FY 1997—each prohibited use of any funds provided in the enactments to carry out any program of distributing sterile needles.

1997—P.L. 105-78, the Departments of Labor, HHS, and Education Appropriation Act for FY 1998, continued prior restrictions on needle-exchange programs through March 31, 1998, permitting funding thereafter of those programs meeting certain statutory requirements including criteria of the HHS Secretary.

1998—P.L. 105-277, the Omnibus Consolidated and Emergency Supplemental Appropriations Act-1999, restored the general prohibition on funds for needle exchange programs; statutorily reestablished ONDCP in the Executive Office of the President with significantly expanded authority over drug control agencies; and required ONDCP to conduct a 4-year (FYs 1999-2002) national anti-drug media campaign aimed at youth.

1999—P.L. 106-113, the Consolidated Appropriations Act-2000, continued the ban on funding of sterile needle and syringe exchange programs; prohibited use of appropriated funds for promotion of legalization of any Schedule I controlled substance; and postponed termination of NIDA's triennial report until 5/15/2000.

2000—P.L. 106-554, the Consolidated Appropriations Act-2001, authorized the Director of NIH to negotiate a long-term lease for research facilities at Baltimore's Bayview Campus, and continued prior prohibitions on funding of sterile needle/syringe exchange programs and on promotion of legalization of Schedule I controlled substances.

P.L. 106-310, the Children's Health Act of 2000, repealed the Narcotic Addict Rehabilitation Act of 1966 [P.L. 89-793]; waived certain requirements of the Controlled Substances Act to permit qualified physicians to engage in office-based treatment of opiate dependence; and authorized expansion of NIDA research on methamphetamine and increased emphasis on ecstasy research.

2001—P.L. 107-116, the Departments of Labor, HHS, and Education FY 2002 Appropriations Act, continued prior prohibitions on funding of sterile needle and syringe exchange programs and on legalization of Schedule I controlled substances.

2002—Title II of P.L. 107-273, the Drug Abuse Education, Prevention, and Treatment Act of 2002, authorized NIDA expansion of interdisciplinary research and clinical trials with treatment centers of the National Drug Abuse Treatment Clinical Trials Network; and required a NIDA study on development of medications for amphetamine/methamphetamine addiction.

2003—Division G of P.L. 108-7, the Departments of Labor, HHS, and Education FY 2003 Appropriations Act, continued prior prohibitions on funding of sterile needle and syringe exchange programs and on legalization of Schedule I controlled substances.

2004—P.L. 108-358, the Anabolic Steroids Control Act of 2004, significantly expanded the list of anabolic steroids classified as controlled substances; required a review of Federal sentencing guidelines; and authorized $15 million, for each of the next fiscal years through 2009, for educational programs in schools to highlight the dangers of steroids, with preference given to programs deemed effective by NIDA.

2005—P.L. 109-56 amended the Controlled Substances Act to lift the patient limitations imposed on medical practitioners in group practices regarding the prescribing of drug addiction treatments. Section 2013 of P.L. 109-59, the Safe, Accountable, Flexible, Efficient Transportation Equity Act, directed the Secretary of Transportation to advise and coordinate with other Federal agencies to address driving under the influence of controlled substances and, in cooperation with NIH (NIDA), to submit a report to Congress on drug-impaired driving.

2006—P.L. 109-469, the U.S. Office of National Drug Control Policy (ONDCP) Reauthorization Act of 2006, in section 1102, amended the Controlled Substances Act to further relax the patient limitations on provision of drug addiction treatments, allowing medical practitioners to notify the HHS Secretary of need and intent to treat up to 100 patients. Section 1120 required the ONDCP Director to consult with NIH (NIDA) and the National Academy of Sciences in making policy relating to syringe exchange programs.

2006—P.L. 109-482 (H.R. 6164), the National Institutes of Health Reform Act of 2006, reaffirmed certain organizational authorities of the NIH Director including establishing, abolishing, and reorganizing national research institutes. It established the Scientific Management Review Board (SMRB) to advise the NIH Director on the use of these organizational authorities. In 2009, the SMRB began discussions about how to optimize research into substance use, abuse, and addiction at the NIH. In 2010, the SMRB voted in favor of recommending to the NIH Director the establishment of a new institute for substance use, abuse, and addiction-related research and the dissolution of NIAAA and NIDA.

2008—P.L. 110-199, Second Chance Act of 2007, reauthorized and rewrote provisions of the 1968 Omnibus Crime Control and Safe Streets Act to expand reentry services for offenders. Required the Attorney General (1) to consult with NIDA (and SAMHSA) regarding performance outcome measures and data collection related to substance abuse and mental health services [sec.101 (k)]; and (2) in consultation with NIDA to conduct a study on the use and effectiveness of funding aftercare services for offenders completing substance abuse programs while incarcerated [sec. 102 (c)]. Permitted the U.S. Attorney General in consultation with NIDA to make research grants to evaluate the effectiveness of depot naltrexone for treatment of heroin addiction [sec. 244 (a)].

2009—P.L. 111-117, the Consolidated Appropriations Act, changed federal law regarding potential funding for syringe exchange programs. The Act states: "None of the funds contained in this Act may be used to distribute any needle or syringe for the purpose of preventing the spread of blood borne pathogens in any location that has been determined by the local public health or local law enforcement authorities to be inappropriate for such distribution."; Thus, syringe exchange for this purpose is allowed unless public health or law enforcement authorities choose, at the local level, to prevent it. This change could result in additional research proposals, and thus funding, for syringe exchange-related research projects.

2011—P.L. 112—74, the Consolidated Appropriations Act, rescinded the change made by P.L. 111-117 regarding potential funding for syringe exchange programs. The law now reads, "Notwithstanding any other provision of this Act, no funds appropriated in this Act shall be used to carry out any program of distributing sterile needles or syringes for the hypodermic injection of any illegal drug." It is so far unclear how these changes might affect research in this area.

BIOGRAPHICAL SKETCH OF NIDA DIRECTOR, NORA D. VOLKOW, M.D.

Nora D. Volkow, M.D., became Director of the National Institute on Drug Abuse (NIDA) at the National Institutes of Health in May 2003. NIDA supports most of the world's research on the health aspects of drug abuse and addiction.

Dr. Volkow's work has been instrumental in demonstrating that drug addiction is a disease of the human brain. As a research psychiatrist and scientist, Dr. Volkow pioneered the use of brain imaging to investigate the toxic effects and addictive properties of abusable drugs. Her studies have documented changes in the dopamine system affecting, among others, the functions of frontal brain regions involved with motivation, drive, and pleasure in addiction. She has also made important contributions to the neurobiology of obesity, ADHD, and aging.

Dr. Volkow was born in Mexico, attended the Modern American School, and earned her medical degree from the National University of Mexico in Mexico City, where she received the Premio Robins award for best medical student of her generation. Her psychiatric residency was at New York University, where she earned the Laughlin Fellowship Award as one of the 10 Outstanding Psychiatric Residents in the USA.

Dr. Volkow spent most of her professional career at the U.S. Department of Energy's Brookhaven National Laboratory (BNL) in Upton, NY, where she held several leadership positions, including Director of Nuclear Medicine, Chairman of the Medical Department, and Associate Director for Life Sciences. In addition, Dr. Volkow was a professor in the Department of Psychiatry and Associate Dean of the Medical School at the State University of New York (SUNY)—Stony Brook.

Dr. Volkow has published more than 530 peer-reviewed articles and written more than 80 book chapters and non-peer-reviewed manuscripts, and has also edited three books on neuroimaging for mental and addictive disorders.

During her professional career, Dr. Volkow has been the recipient of multiple awards, including her selection for membership in the Institute of Medicine in the National Academy of Sciences and the International Prize from the French Institute of Health and Medical Research for her pioneering work in brain imaging and addiction science. She was recently named one of *Time* magazine's "Top 100 People Who Shape our World" and was included as one of the 20 people to watch by

Newsweek magazine in its "Who's Next in 2007" feature. She was also included in *Washingtonian Magazine's* 2009 and 2011 list of the "100 Most Powerful Women" and named "Innovator of the Year" by *U.S. News & World Report* in 2000.

NIDA DIRECTORS

Name	In Office from	To
Robert L. DuPont	1973	1978
William Pollin	1979	1985
Charles R. Schuster	1986	1992
Richard A. Millstein (Acting)	1992	1994
Alan I. Leshner	1994	2001
Glen R. Hanson (Acting)	2001	2003
Nora D. Volkow	2003	Present

DIVISIONS AND OFFICES

Office of the Director

The Office of the Director (OD) leads the Institute by setting research and programmatic priorities. In order to help coordinate key OD functions, a position of Director of Program Integration at NIDA was created in 2008. This position is designed to facilitate collaboration across NIDA's Divisions, Offices, and Centers as well as across the NIH with an emphasis on program development. In addition, cross-cutting initiatives are coordinated through special offices within the Office of the Director.

The Special Populations Office has two goals: (1) to address the research training and career development needs of underrepresented minorities and others (women, individuals with disabilities, etc.) in drug abuse research and (2) to ensure that minority issues in drug abuse research are adequately represented in the work supported by NIDA.

The AIDS Research Program office provides direction and leadership for the development of a progressive HIV/AIDS research portfolio that addresses the unique dimensions of drug abuse as it relates to HIV/AIDS. The development and implementation of this research program is guided by several factors including, but not limited to, the epidemiology of the HIV/AIDS pandemic, the evolution of HIV/AIDS diagnoses and treatment, and the role of drug abuse and related behaviors in the spread and progression of HIV/AIDS.

The NIDA International Program fosters international cooperative research and the exchange of scientific information by drug abuse researchers around the globe. NIDA's international objectives include promoting international research activities; supporting research training and exchange opportunities globally; communicating and disseminating science-based information on drug abuse; and supporting international research collaboration.

NIDA's Women and Sex/Gender Differences Research Program promotes the conduct, translation, and dissemination of drug abuse research on sex/gender differences and issues specific to women. Research on women and gender differences is supported in all of NIDA's programmatic branches and is grouped into four major program areas: Etiology, Consequences, Prevention, and Treatment and Services.

Division of Epidemiology, Services, and Prevention Research

The Division of Epidemiology, Services, and Prevention Research plans, stimulates, develops, and supports a broad extramural research program to study: (1) the nature, patterns, and consequences of drug use among general, special, and community-based populations; (2) innovative sampling, data collection, and analytic methodologies designed to support epidemiology and prevention and early intervention and services research; (3) prevention of drug use and addiction, and services research including the prevention of medical/social/psychological sequelae of drug use; (4) behavioral and social science research in the context of communities and defined populations, including the consequences of drug use such as delinquency and violence; (5) services research on the impact of the organization, financing, and management of treatment programs and services systems on quality, cost, access, and outcomes of care; and (6) economic modeling and configuration of the treatment system.

Division of Basic Neuroscience and Behavioral Research

The primary goal of the Division of Basic Neuroscience and Behavioral Research is to support an extramural program of research in the basic biomedical and behavioral sciences that relates to the public health problem of drug abuse and addiction. The supported research provides an understanding of the neurobiological and behavioral effects of drugs of abuse. Research focuses on the genetic, epigenetic, and neurobiological mechanisms of addiction, drug craving, effects of drugs on behavior and cognition, long-term chronic effects of drugs, and drug metabolism. Basic research concerned with understanding the complex interrelationship between drug abuse and HIV/AIDS progression and transmission is also supported. The research supported by the Division provides important fundamental information for developing prevention and treatment interventions for drug abuse and addiction.

Division of Clinical Neuroscience and Behavioral Research

The Division of Clinical Neuroscience and Behavioral Research supports a broad range of research focused on translating addiction science related to brain, behavior, and health through an integrated research program in clinical neuroscience, development, and behavioral treatment, including HIV/AIDS. This division has three

research branches that develop and administer national research and research training programs:

The Clinical Neuroscience Branch (CNB) advances a clinical research and research training program focused on understanding the neurobiological substrates of drug abuse and addiction processes, including the etiology of drug use and transition from drug use to addiction. A major focus of this program is on the characterization of how abused drugs affect the structure and function of the human central nervous system and the behavioral processes subserved by neural circuits. Another major emphasis of this program is on individual differences in neurobiological, genetic, and neurobehavioral factors that underlie increased risk for and/or resilience to drug abuse, addiction, and drug-related disorders.

The Behavioral and Brain Development Branch (BBDB) supports a spectrum of research and research training programs that addresses relationships among drug use/abuse/addiction, social/physical environment factors, and human development, with emphasis on neurodevelopmental, cognitive, and behavioral mechanisms that underlie these relationships. Studies cover the full developmental time course from prior to conception through adulthood and into senescence, and utilize a variety of behavioral and neuroscience research methods.

The Behavioral and Integrative Treatment Branch (BITB) supports research directed toward the development and improvement of drug abuse treatment and intervention for associated problems. The Branch encourages a staged approach to treatment and intervention development, supporting activities required to translate findings from basic science, other areas of health, or clinical observation, into researchable interventions; supporting the full-scale testing of promising or established interventions; and supporting the development of clinical training and supervision methods, streamlining of interventions, and other activities that prepare an intervention for dissemination.

Center for the Clinical Trials Network

The Center for the Clinical Trials Network (CCTN) was established in 1999 with the goal to improve Substance Use Disorders (SUD) treatment by accelerating the pace of translating basic discoveries into clinical practice, fostering and mentoring of emerging scientists and physicians, and communicating research advances to the public. The CTN is an expansive enterprise that brings together providers from more than two hundred hospitals, clinics, treatment centers, private practices and scientists from fifty-seven affiliated universities in an organization of thirteen Regional Research Training Centers (RRTCs) funded through cooperative agreements. The network serves a NIDA-wide mission to identify gaps in knowledge, develop community based health care system oriented approaches to increase the use of evidence-based addiction treatment by individuals, communities, health care providers, public institutions, and especially by populations that experience a disproportionate disease burden.

Division of Pharmacotherapies and Medical Consequences of Drug Abuse

The Division of Pharmacotherapies and Medical Consequences of Drug Abuse plans and directs studies necessary to identify, evaluate, develop, and obtain FDA marketing approval for medications to treat substance use disorders (SUDs). The Division develops and administers a program of basic and clinical research to develop innovative pharmacological (both chemical and biological) approaches to treat SUDs. This program is implemented through collaborations with academia, industry (pharmaceutical and biotechnology companies), and other government institutions (e.g., the Veterans Administration and the FDA). The Division also coordinates and provides leadership in the area of medical conditions associated with SUDs, including but not limited to HIV/AIDS.

Intramural Research Program

NIDA's Intramural Research Program is located in Baltimore, MD. Originally known as the Addiction Research Center, the Intramural Research Program conducts multidisciplinary research on basic biological and behavioral mechanisms that underlie drug abuse and addiction, including its causes and adverse consequences. Research is also supported on treatments for drug addiction and HIV transmission of injection drug users. Studies range from molecular to laboratory research with animals to clinical studies with human volunteers. The program employs the latest technologies—including optogenetic approaches and magnetic resonance imaging—to study the action of drugs in the human brain and transgenic species to better understand the role of genes in drug abuse. The intramural program also serves as a national and international training center for young investigators in the drug abuse field.

Office of Science Policy and Communications

The Office of Science Policy and Communications leads NIDA's strategic efforts to inform public health policy and practice by ensuring the Institute is the trusted source for scientific information on drug abuse and addiction. The Office executes this goal by (1) developing, designing, and/or reviewing all materials for the public, including publications (e.g., *NIDA Notes*) and other resources; (2) initiating and monitoring press relations activities; (3) conducting public education and media campaigns; (4) interacting with Congress (e.g., developing NIDA's Congressional budget justification and testimony; briefings) and the White House Office of National Drug Control Policy; (5) directing constituent relations with scientific, professional, and community-based organizations with an interest in drug abuse research and related issues; (6) responding to inquiries from the public, NIH, HHS, other Federal Agencies, Congress, and the White House; (7) coordinating NIDA's science meetings, research training, and science education programs; (8) serving as OMB Clearance Office for NIDA-sponsored data collections; and (9) conducting portfolio analyses and evaluations of NIDA programs.

Office of Extramural Affairs

NIDA's Office of Extramural Affairs (1) provides advice and guidance to the NIDA Director regarding the Institute's peer review process and extramural policy; (2) provides scientific analyses of the Institute's extramural research program, assessing the breadth and scope of the Institute's research activities; (3) administers the peer review of extramural grant applications; (4) administers contract concept reviews and peer review of all contract proposals; (5) administers the National Advisory Council on Drug Abuse second level review of extramural support mechanisms and advises on overall NIDA program and policy manners; (6) coordinates and assures the development of program policies and rules relating the Institute's extramural activities, including Institute responsibility for inquiries and investigations into misconduct in science; (7) coordinates Institute activities under the Privacy Act; (8) manages issuance of Confidentiality Certificates; and (8) administers the Institute's committee management function under the National Advisory Council Act.

Office of Management

The Office of Management (1) provides all administrative and management support services to the Institute in such areas as: financial planning, analysis, and management; administrative services; personnel management; information resources management; grants and contracts management; and management analysis; (2) develops, implements, and monitors administrative management policies, procedures, and guidelines; (3) develops and monitors the implementation of program policies and plans, and evaluates progress in meeting established Institute objectives; (4) develops data requirements pertinent to short- and long-range program planning and develops the Institute's program evaluation policy; (5) administers the Institute's program evaluation system for all Institute employees; and (6) maintains responsibility for all management and administrative policy studies, reports, analyses, and program objectives.

This page last reviewed on August 6, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Recent Photos from the National Institute on Drug Abuse (NIDA)

2012 PHOTOS

The NIDA Easy-to-Read Drug Facts logo.
lo-res

Logo for NIDA Family Check Up: Positive Parenting Prevents Drug Abuse.
lo-res

2011 PHOTOS

The Addiction Performance Project is a CME & CE program by the National Institute on Drug Abuse (NIDA) to help break down the stigma associated with addiction and promote a healthy dialogue that fosters compassion, cooperation, and understanding for patients living with this disease. This project is part of NIDA's outreach to practicing health professionals and those in training.
lo-res | hi-res

NIDAMED is a program of the National Institute on Drug Abuse that gives health care professionals tools and resources to screen their patients for tobacco, alcohol, and drug use. The initiative stresses the importance of the patient-doctor relationship in identifying unhealthy behaviors before they evolve into life threatening conditions.
lo-res | hi-res

2010 PHOTOS

NIDA's new in 2010 "Drug Facts: Shatter the Myths" Q&A booklet answers teens' most frequently asked questions about drugs and drug abuse.
lo-res

In November, 2010, NIDA launched National Drug Facts week, a health observance week for teens that aims to shatter the myths about drugs and drug abuse.
lo-res

Daevion Caves (age 18) and Jordan Earle Atkins (age 16) of Alton High School in Alton, IL won first place in the *Teen Substance Abuse Awareness through Music Contest*—a collaboration between NIDA and the MusiCares and GRAMMY Foundations.
lo-res

2009 PHOTOS

On April 20, 2009, NIDA launched its first comprehensive Physicians' Outreach Initiative, NIDA**MED** at a news conference at the National Press Club in D.C. Speakers included, NIDA Director Dr. Volkow, Acting Director of the Office of National Drug Control Policy Ed Jurith, U.S. Senator Carl Levin of Michigan, Acting U.S. Surgeon General Steven K. Galson and leaders of other organizations committed to helping patients who struggle with drug-related medical issues.
lo-res | hi-res

The NIDA**MED** initiative stresses the importance of the patient-doctor relationship in identifying unhealthy behaviors before they evolve into life threatening conditions. This patient-tested poster—one of the NIDA**MED** resources—encourages patients to "Tell Your Doctors About All the Drugs You Use." Doctors are encouraged to put the poster on display in their waiting rooms.
lo-res | hi-res

2008 PHOTOS

NIH's Biomedical Research Center, located on the Johns Hopkins University Bayview campus in Baltimore, Maryland, opened on June 2, 2008. The Biomedical Research Center contains major components of the intramural research programs of the National Institute on Drug Abuse, including 500,000 gross square feet of laboratory, vivarium, and administration space.
lo-res | hi-res

2007 PHOTOS

The cover of the NIDA's first plain language booklet explaining the science behind addiction—*Drugs, Brains & Behavior - The Science of Addiction.*
lo-res | hi-res

During NIDA's first national "Drug Facts Chat Day," more than 40 scientists and science writers who specialize in addiction issues answered over 36,000 questions submitted online by high school students across the country. The students asked wide-ranging questions on drug abuse-related topics, and experts tried to answer them as soon as possible.
lo-res | hi-res

NIDA Director Dr. Nora Volkow was among the experts who assisted during the chat day's 10-hour question-and-answer session. The scientists and writers sometimes fielded as many as 6,000 questions per hour.
lo-res | hi-res

NIDA staffers David Anderson, Dr. Ruben Baler, and Dr. Barry Hoffer answered students' questions about how drugs affect the brain during NIDA's Drug Facts Chat Day.
lo-res | hi-res

This page last reviewed on February 12, 2013

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National Institute of Environmental Health Sciences

Research Triangle Park, N.C.

Mission | Important Events | Director | Programs | Photo Gallery

MISSION

The mission of the National Institute of Environmental Health Sciences is to discover how the environment affects people in order to promote healthier lives. Achieving this mission depends on a set of core values that apply to all activities of the Institute:

- Research excellence (innovation; discovery of new scientific knowledge and technology);
- Management excellence; and
- Community outreach, education, and involvement.

At NIEHS and the National Toxicology Program, we engage in a special form of public service —producing scientific knowledge that promotes individual and public health. Our Institute is uniquely positioned to help prevent disease and transform new scientific knowledge into improvements in human health. There are many opportunities before us to build and expand the contributions of the NIEHS:

- Foster research on environmental triggers of disease;
- Communicate advances in environmental health sciences to the public;
- Foster training and development of emerging young environmental health scientists and practitioners;
- Enhance translation of knowledge from research to disease prevention; and
- Foster safety assessment research on chemicals and other environmental factors.

The fulfillment of this mission requires the partnership and effort of everyone in the environmental health sciences communities.

IMPORTANT EVENTS IN NIEHS HISTORY

June 7, 1960—A study group on the U.S. Public Health Service (PHS) mission and organization states that environmental health problems require increased public and private effort, and predicts that a central laboratory facility would be needed.

November 1, 1961—The Committee on Environmental Health Problems recommends to PHS that a national center be established to undertake integrated research and other activities related to environmental health.

September 1964—In the wake of the best-selling book by Rachel Carson, *Silent Spring*—which forecast the deaths of birds and possibly people from the use of persistent chemicals—Congress authorizes funds to plan a central environmental health research facility.

January 7, 1965—The U.S. Surgeon General announces the establishment of the Division of Environmental Health Sciences as a part of the National Institutes of Health.

September 26, 1967—A deed for 509.25 acres within Research Triangle Park, N.C., is presented to the Surgeon General for a permanent site for the Division of Environmental Health Sciences.

January 12, 1969—The Secretary of the then-Department of Health, Education, and Welfare (HEW) elevates the division to Institute status—as the National Institute of Environmental Health Sciences.

April 1972—The first edition of *Environmental Health Perspectives*, an NIEHS scientific journal, is issued.

April 1977—Construction begins on NIEHS' $65.7 million facility.

November 15, 1978—HEW Secretary Joseph Califano announces the establishment of the National Toxicology Program.

July 14, 1981—U.S. Department of Health and Human Services (HHS) Secretary Richard Schweiker approves the reorganization of NIEHS, transferring the National Cancer Institute's Division of Cancer Cause and Prevention bioassay program to NIEHS.

October 5, 1981—The National Toxicology Program is made a permanent activity of HHS.

November 20, 1985—NIEHS is established in law by the Health Research Extension Act of 1985 (Public Law 99-158).

September 14, 1994—NIEHS and collaborators at the University of Utah announce identification of the first breast cancer gene, BRCA1. View Image.

October 10, 1994—Martin Rodbell, NIEHS scientist emeritus and former scientific director, is named co-recipient of the 1994 Nobel Prize in Physiology or Medicine for his work in discovering G-proteins, which transmit signals between cells. View Image.

May 12, 1995—NIEHS announces isolation and cloning of a gene that suppresses the spread of prostate cancer.

December 6, 1995—Experiments conducted by NIEHS researchers show that phenolphthalein, a widely used laxative, causes ovarian and other cancers in laboratory rats and mice.

February 6, 1996—NIEHS scientists report that people who are missing the gene GST11 are more likely to get myelodysplastic syndrome, or MDS—a serious, often fatal, bone marrow disease.

July 2, 1996—NIEHS researchers find that women who douche more than once a week are about 30% less likely to conceive in a given month than those who do not.

October 29, 1996—The newly completed 4-story laboratory "F Module" is dedicated on the celebration of NIEHS' 30th anniversary.

October 17-18, 1997—NIEHS' Environmental Genome Project is announced to an international audience of scientists. The project is described as one to explore the gene variations (called "polymorphisms," which means "many forms") that influence people's susceptibility to environmental exposures that cause disease in some people, none in others.

1998—NIEHS' Marine and Freshwater Research Centers and the U.S. Navy sponsor the ocean-theme United States Pavilion, complete with an iceberg, at the World Expo in Lisbon, Portugal.

August 10, 1998—NIEHS and the Environmental Protection Agency jointly fund the creation of 8 Children's Environmental Health Research Centers.

June 22, 1999—The new Interagency Coordinating Committee on the Validation of Alternative Methods—a group formed by NIEHS, the National Toxicology Program (which is headquartered at NIEHS), and other health and regulatory agencies—for the first time concludes that, in many chemical tests, a non-animal test can replace the use of laboratory animals in a key test of whether a chemical is likely to burn or corrode human skin. Acceptance of this alternative test is followed on **December 28, 1999** by acceptance by regulatory agencies of the Murine Local Lymph Node Assay for products causing allergic contact dermatitis, which greatly reduced the number of guinea pigs used in testing.

May 9, 2000—The First National Allergen Survey, led by NIEHS scientists in collaboration with the U.S. Department of Housing and Urban Development, finds more than 45% of U.S. housing stock has bedding with dust mite allergen concentrations that exceed 2 micrograms per gram of dust, a level associated with the development of allergies.

December 14, 2000—NIEHS-supported researchers at The Johns Hopkins University School of Public Health publish research findings showing a strong correlation between exposure to particulate matter air pollution and death from all causes including cardiovascular and respiratory illnesses. These analyses provide evidence that particulate matter pollution continues to cause adverse health outcomes and strengthens the argument for maintaining air quality standards for this pollutant.

January 2001—Grantees from the University of Southern California publish reports showing modest increases in ambient ozone concentration are associated with increases in school absenteeism.

September 2001—NIEHS-supported grantees in and around New York City joined forces to monitor exposures and advise clean-up crews and residents exposed to hazardous working and living conditions resulting from the terrorists attacks on the World Trade Center. Air monitoring stations were established, and many research studies were begun to determine possible adverse health effects. Grantees from the NIEHS Worker Safety and Education Program were on-site immediately following the collapse of the buildings to provide advice and assistance for protecting the health of the clean-up crews.

November 5, 2001—NIEHS awards $37 million to 5 academic research organizations to form a Toxicogenomics Research Consortium with the Institute's own National Toxicogenomics Center. Building a library of known toxins and the genes they turn "on" or "off," the Center seeks to use an array of cloned genes to review chemicals for toxicity. Further down the road, the technology may be used on individual patients to tailor preventive, diagnostic and treatment methods.

July 3, 2002—An NIEHS analysis of data from 7 European cities suggests that healthy young couples need not jump into expensive reproductive assistance too soon. The study showed that better than 90% of the couples who failed to achieve a pregnancy in their first year of unprotected intercourse achieved conception before a second year was out—without medical assistance.

August 29, 2002—NIEHS-supported researchers at the University of California at San Diego discover that *B. anthracis* evades the host immune system, using a toxin

called lethal factor (LF) to destroy macrophages and spread throughout the body. These results may explain why anthrax infections proceed nearly undetected until the patient is very sick and near death.

April 17, 2003—NIEHS grantees at the Cincinnati-Children's Hospital Medical Center and the University of Rochester Medical Center find that IQ scores for children with blood lead levels at 10 micrograms/dl were 7.4 points lower than for children at 1 microgram/dl. Surprisingly, the study also concludes that as blood lead increased from 10 to 30 micrograms/dl, there was a more modest decline in IQ scores, indicating that more damage occurs at lower levels for any given exposure. These results emphasize the importance of prevention and add further evidence that there is indeed no safe level of lead exposure.

October 18, 2004—A new study that will look at 50,000 sisters of women diagnosed with breast cancer opens for enrollment across the United States. The largest study of its kind, the Sister Study will investigate environmental and genetic causes of breast cancer.

December 10, 2004—Grantees at the Harvard School of Public Health and Brigham and Women's Hospital demonstrate that lifetime lead exposure may increase the risk of developing cataracts, the leading cause of blindness. Men with high levels of lead in the tibia, the larger of the 2 leg bones below the knee, had a 2.5-fold increased risk for cataracts.

May 2005—A comparison study across 7 different laboratories demonstrates how scientists can get more consistent and reliable results when using gene chips, or microarray technologies. Microarrays allow researchers to see which genes are active in both normal and diseased cells. In the past, scientists have had trouble comparing microarray data from different sources. The new study shows that using a standardized process and commercially manufactured microarrays (rather than microarrays made in-house by each lab) leads to the best reproducible results.

May 10, 2005—NIEHS releases "A National Toxicology Program for the 21st Century: A Roadmap for the Future." The Roadmap outlines a plan to strategically position the National Toxicology Program at the forefront for providing scientific data and for guiding the interpretation of those data to maximize their impact on public health. A meeting was held at the National Academy of Sciences to reflect on the history of the National Toxicology Program and its impact on public health since its establishment in 1978 and unveil the plans and directions for the program's future.

June 1, 2005—NIEHS brings together national and community leaders with researchers to sort out how a child's environment increases the risk for obesity and to identify ways the environment can be changed to address this health epidemic. More than 700 people gathered for a 2-day conference, "Environmental Solutions to Obesity in America's Youth."

February 8, 2006—Two NIH Initiatives launch intensive efforts to determine genetic and environmental roots of common diseases. One initiative boosts NIH funding for a multi-institute effort to identify the genetic and environmental underpinnings of common illnesses. The other initiative creates a public-private partnership between NIH, the Foundation for the National Institutes of Health, and major pharmaceutical and biotechnology companies, especially Pfizer Global Research & Development of New London, CT, and Affymetrix Inc. of Santa Clara, CA, to accelerate genome association studies to find the genetic roots of widespread sicknesses.

May 1, 2006—The NIEHS Director unveils a new strategic plan aimed at challenging and energizing the scientific community to use environmental health sciences to understand the causes of disease and to improve human health. The plan, *New Frontiers in Environmental Sciences and Human Health*, fundamentally changes the way NIEHS approaches research. The new strategy emphasizes research focused on complex human disease, and calls for inter-disciplinary teams of scientists to investigate a broad spectrum of disease factors, including environmental agents, genetics, age, diet, and activity levels.

October 25, 2006—A teleconference with the NIEHS Director, leading scientific experts, and the media preceded a 2-day meeting at which researchers announce they have successfully sequenced the DNA of 15 mouse strains most commonly used in biomedical research. More than 8.3 million genetic variations, or single nucleotide polymorphisms (SNPs), were discovered among the genomes of the 15 mouse strains, and the data are now available on a public website.

May 16, 2007—Researchers announce that there is strong evidence a chemical referred to as hexavalent chromium, or chromium 6, causes cancer in laboratory animals when it is consumed in drinking water. The 2-year study conducted by the National Toxicology Program shows that animals given hexavalent chromium developed malignant tumors. Earlier studies had shown that hexavalent chromium causes lung cancer in humans in certain occupational settings as a result of inhalation exposure. The new findings show that it can also cause cancer in animals when administered orally.

October 9, 2007—A report issued by the National Academies of Sciences recognizes the importance of toxicogenomics in predicting effects on human health and recommends the integration of toxicogenomics into regulatory decision making. Toxicogenomic technologies provide tools to better understand the mechanisms through which environmental agents initiate and advance disease processes. They can also provide important information to help identify individuals who are more susceptible to disease risks posed by certain environmental agents than the general population.

February 14, 2008—NIEHS and the National Toxicology Program form a formal collaboration with NIH's National Human Genome Research Institute and the U.S. Environmental Protection Agency to improve the safety testing of chemicals. The collaboration creates a toxicity testing process using state-of-the-art robotic technologies that rely less on animals and more on cell-based tests and will generate data that are specifically applicable to humans.

September 3, 2008—The National Toxicology Program releases its final report on Bisphenol-A (BPA), a high-production volume chemical used primarily in the production of polycarbonate plastics and epoxy resins. The report found current human exposure to BPA to be of "some concern" for effects on development of the prostate gland and brain and for behavioral effects in fetuses, infants, and children. The National Toxicology Program uses a 5-level scale ranging from negligible to serious, with "some concern" being the midpoint.

July 27, 2009—NIEHS opened a new 14,000-square-foot Clinical Research Unit on the NIEHS campus in Research Triangle Park, N.C. The facility provides infrastructure and staffing for the on-site Clinical Research Program and supports multiple NIEHS investigators. The staff supports the development of translational research protocols, assists research staff, recruits patients, and coordinates reimbursement for patients participating in research studies.

April 21, 2010—An NIEHS-led interagency effort identified 11 key categories of diseases and other health consequences of global climate change. As part of an *ad hoc* interagency working group on climate change and health, NIEHS teamed up with other government and international researchers to address public health concerns and vulnerability related to climate change. Discussions demonstrated that climate change mitigation strategies, in addition to reducing greenhouse gases, have additional benefits for public health. The group issued its report on Earth Day, April 21, 2010, as a supplement to the NIEHS journal, Environmental Health Perspectives.

Also, NIEHS, along with British partners, funded a 2009 series in the journal Lancet that concluded that the savings from improving health would offset the cost of addressing climate change.

June 2010 — In June 2010, the NIH director, asked NIEHS to lead a study on the health of the workers and volunteers most directly involved in responding to the 2010 Deepwater Horizon explosion and oil spill. That same month NIEHS initiated the Gulf Long-term Follow-up Study (GuLF STUDY), the largest study ever conducted on the potential health effects associated with an oil spill.

June 10, 2011—The U.S. Department of Health and Human Services added eight substances to its Report on Carcinogens, a science-based document that identifies chemicals and biological agents that may put people at increased risk for cancer.

The industrial chemical formaldehyde and a botanical known as aristolochic acids are listed as known human carcinogens. Six other substances — captafol, cobalt-tungsten carbide (in powder or hard metal form), certain inhalable glass wool fibers, o-nitrotoluene, riddelliine, and styrene - are added as substances that are reasonably anticipated to be human carcinogens. With these additions, the 12th Report on Carcinogens now includes 240 listings.

The Report on Carcinogens is a congressionally mandated document that is prepared for the HHS Secretary by the National Toxicology Program. The report identifies agents, substances, mixtures, or exposures in two categories: known to be a human carcinogen and reasonably anticipated to be a human carcinogen.

August 1, 2012 — NIEHS director introduces the 2012-2017 strategic plan for NIEHS, "Advancing Science Improving Health: A Plan for Environmental Health Research." NIEHS, with the help of its stakeholders, lays out a plan that has descriptive strategic themes and 11 goals that are identified as priority areas for the field. As the NIEHS moves forward, our overall goal is to make the institute, including the National Toxicology Program (NTP), the foremost trusted source of environmental health knowledge, leading the field in innovation and the application of research to solve health problems.

BIOGRAPHICAL SKETCH OF NIEHS DIRECTOR LINDA S. BIRNBAUM, PH.D., D.A.B.T., A.T.S.

Dr. Linda S. Birnbaum is director of the National Institute of Environmental Health Sciences (NIEHS) of the National Institutes of Health, and the National Toxicology Program. As director of NIEHS and the National Toxicology Program, Dr. Birnbaum oversees a budget that funds multidisciplinary biomedical research programs, prevention, and intervention efforts that encompass training, education, technology transfer, and community outreach. The NIEHS supports more than 1,000 research grants.

Dr. Birnbaum has received numerous awards and recognitions, including being elected to the Institute of Medicine of the National Academies, in October 2010, one of the highest honors in the fields of medicine and health. She was elected to the Collegium Ramazzini, and received an honorary Doctor of Science from the University of Rochester and a Distinguished Alumna Award from the University of Illinois. Other awards include the 2011 NIH Director's Award, Women in Toxicology Elsevier Mentoring Award, Society of Toxicology Public Communications Award, EPA's Health Science Achievement Award and Diversity Leadership Award, National Center for Women's 2012 Health Policy Hero Award, Breast Cancer Fund Heroes Award, and 14 Scientific and Technological Achievement Awards, which reflect the recommendations of EPA's external Science Advisory Board, for specific publications.

She is the author of more than 600 peer-reviewed publications, book chapters, abstracts, and reports. Dr. Birnbaum received her M.S. and Ph.D. in microbiology from the University of Illinois, Urbana. A board-certified toxicologist, Dr. Birnbaum has served as a federal scientist for nearly 29 years—19 years with the EPA Office of Research and Development, and the first 10 years at NIEHS as a senior staff fellow at the National Toxicology Program, then as a principal investigator and research microbiologist, and finally as a group leader for the Institute's Chemical Disposition Group.

NIEHS DIRECTORS

Name	In Office from	To
Paul Kotin	November 1, 1966	February 28, 1971
David P. Rall	March 1, 1971	October 1, 1990
David G. Hoel (Acting)	October 1990	June 1991
Kenneth Olden	June 18, 1991	May 21, 2005
David A. Schwartz	May 22, 2005	August 19, 2007
Samuel H. Wilson (Acting)	August 20, 2007	December, 2008
Linda S. Birnbaum	January 16, 2009	Present

PROGRAMS

The NIEHS provides additional oversight and program development in the following areas:

Exposure Biology Program of the NIH Genes and Environment Initiative

The NIEHS leads the Exposure Biology Program, one of the two main components of the NIH Genes and Environment Initiative. The Exposure Biology Program focuses on the development of innovative technologies to measure environmental exposures, diet, physical activity, psychosocial stress, and addictive substances that contribute to the development of disease.

National Children's Study

National Children's Study (http://www.nationalchildrensstudy.gov/) is designed to examine the effects of environmental influences on the health and development of more than 100,000 children across the United States. NIEHS plays a lead role in this program.

NIH Roadmap Epigenomics Program

The goals of the NIH Roadmap Epigenomics Program are to create an international committee; develop standardized platforms, procedures, and reagents for epigenomics research; conduct demonstration projects to evaluate how epigenomes change; develop new technologies for single-cell epigenomic analysis and in vivo imaging of epigenetic activity; and create a public data resource to accelerate the application of epigenomics approaches.

Education and Biomedical Research Development

NIEHS is committed to establishing goals and developing programs to assure minority participation and success in NIEHS research and training programs. Included in these activities are K-12 environmental health sciences education programs, minority health research and training programs, environmental health research and training programs at minority institutions, and research and training programs that address low-income and underserved populations.

NanoHealth Enterprise Initiative

NIEHS is engaged in efforts to establish an NIH NanoHealth Enterprise. This broad-based initiative is designed to investigate the fundamental physico-chemical interactions of engineered nanomaterials with biological systems and the use of nanotechnology research as a tool for exploring cellular and molecular structure function relationships. The initiative outlines an integrated, interdisciplinary program that draws upon the expertise and interests of the NIH Institutes and Centers, along with other public and private partners to address critical research needs for the safe development of nanoscale materials and devices.

Standing Committee on Identifying and Quantifying Environmental Health Risks

NIEHS has asked the National Academies (NAS) to facilitate communication among government, industry, environmental groups, and the academic community about scientific advances that may be used in the identification, quantification, and control of environmental impacts on human health. The NAS Standing Committee on Use of Emerging Science for Environmental Health Decisions will, on an ongoing basis for a 5-year period, examine issues on the use of new discoveries, new tools, and new approaches for guiding environmental health decisions.

Implementation of the National Toxicology Program Vision and Roadmap

The NIEHS is engaged in a long-term collaboration with the National Toxicology Program to assist in efforts to achieve the program's Vision and Roadmap of future activities, particularly contributing to the development of new tools for high-throughput screening and new animal models of genetic susceptibility.

Institute of Medicine Roundtable on Environmental Health Sciences, Research, and Medicine

The NIEHS was instrumental in establishing the National Academy of Sciences Institute of Medicine Roundtable on Environmental Health Sciences, Research, and Medicine, and continues to sponsor the panel with the NIEHS acting director as a member. The Roundtable was created to provide a mechanism for parties interested in environmental health from the academic, industrial, and federal research perspectives to meet and discuss sensitive and difficult issues of mutual interest in a neutral setting. The purpose is to foster dialogue and discussion among sectors and institutions and to illuminate issues, not resolve them. Among the landmark publications in the Roundtable's history is the seminal 2001 report, *Rebuilding the Unity of Health and the Environment: A New Vision of Environmental Health for the 21st Century*.

This page last reviewed on July 26, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
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Recent Photos from the National Institute of Environmental Health Sciences (NIEHS)

2012 PHOTOS

In August 2012, NIEHS launched its new strategic plan for environmental health research.
lo-res | hi-res

NIEHS is leading the largest study ever conducted on the potential health effects associated with an oil spill. Nearly 33,000 participants have enrolled in the GuLF STUDY (Gulf Long Term Follow-up Study).
lo-res

2011 PHOTOS

Portrait of NIEHS Director Linda S. Birnbaum.
lo-res | hi-res

2007 PHOTOS

Panoramic photograph of the main NIEHS building in Research Triangle Park, NC. Photo by Steven R. McCaw.
lo-res | hi-res

This page last reviewed on July 26, 2013

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MISSION

The National Institute of General Medical Sciences (NIGMS) primarily supports research that lays the foundation for advances in disease diagnosis, treatment, and prevention. The Institute's research training programs help prepare the next generation of scientists.

Each year, NIGMS-supported scientists make many advances in understanding fundamental life processes. In the course of answering basic research questions, these investigators increase our knowledge about the mechanisms and pathways involved in certain diseases. Institute grantees also develop important new tools and techniques, some of which have medical applications. In recognition of the significance of their work, a number of NIGMS grantees have received the Nobel Prize and other high scientific honors.

NIGMS is organized into divisions that support research and research training in a range of scientific fields.

NIGMS was established in 1962. In Fiscal Year 2012, the Institute's budget was $2.429 billion. The vast majority of this money goes into local economies through grants to scientists at universities, medical schools, hospitals and other research institutions throughout the country. At any given time, NIGMS supports approximately 4,700 research grants—approximately 11 percent of the grants funded by NIH as a whole. NIGMS also supports approximately 26 percent of the trainees who receive assistance from NIH. The Institute places great emphasis on supporting investigator-initiated research grants. It funds a limited number of research center grants in selected fields, including structural biology, chemistry, computational modeling, trauma and burn research, systems biology and biomedical technology. It also supports centers that build research capacities in states that have historically received low levels of NIH funding. In addition, NIGMS supports several important scientific resources, including the NIGMS Human Genetic Cell Repository and the Protein Data Bank.

NIGMS has initiatives in structural genomics (the Protein Structure Initiative), pharmacogenomics, and computational modeling of infectious disease outbreaks. The Institute also promotes the collaborative approaches increasingly needed to solve complex problems in biomedical science.

NIGMS research training programs recognize the interdisciplinary nature of biomedical research and stress approaches that cut across disciplinary and departmental lines. Such experience prepares trainees to pursue creative research careers in a wide variety of areas.

Certain NIGMS training programs address areas in which there are particularly compelling needs. One of these, the Medical Scientist Training Program, produces investigators who hold the combined M.D.-Ph.D. degree and are well trained in both basic science and clinical research. Other programs train scientists to conduct research in rapidly growing areas like biotechnology and at the interfaces between fields such as chemistry and biology and behavioral and biomedical sciences.

NIGMS also has a Postdoctoral Research Associate Program, in which postdoctoral scientists receive training in pharmacology in NIH or Food and Drug Administration laboratories.

IMPORTANT EVENTS IN NIGMS HISTORY

July 16, 1958—The Secretary of the U.S. Department of Health, Education, and Welfare (HEW) approved establishment of the Division of General Medical Sciences.

October 17, 1962—Congress authorized establishment of the National Institute of General Medical Sciences.

January 30, 1963—The HEW Secretary approved establishment of NIGMS.

October 8, 1963—The National Advisory General Medical Sciences Council held its first meeting.

October 13, 1982—NIGMS celebrated its 20th anniversary by establishing the DeWitt Stetten, Jr., Lecture. Dr. David S. Hogness, Stanford University, gave the first lecture.

October 1, 1989—Administration of the Minority Biomedical Research Support Program was transferred to NIGMS from the NIH Division of Research Resources.

December 23, 2011—Administration of the Institutional Development Award program was transferred to NIGMS from the former National Center for Research Resources, along with NCRR's biomedical technology programs.

NIGMS LEGISLATIVE CHRONOLOGY

October 17, 1962—Public Law 87-838 authorized the U.S. Surgeon General to establish an institute to conduct and support research and research training in the general or basic medical sciences and in related natural or behavioral sciences that have significance for two or more other institutes of NIH, or that lie outside the general areas of responsibility of any other institute.

BIOGRAPHICAL SKETCH OF NIGMS DIRECTOR JON R. LORSCH, PH.D.

Jon R. Lorsch, Ph.D., became the director of the National Institute of General Medical Sciences in August 2013.

In this position, Lorsch oversees the Institute's $2.291 billion budget, which primarily funds basic research in the areas of cell biology, biophysics, genetics, developmental biology, pharmacology, physiology, biological chemistry, biomedical technology, bioinformatics and computational biology. NIGMS supports nearly 4,500 research grants—about 10.5 percent of those funded by NIH as a whole—as well as a substantial amount of research training and programs designed to increase the diversity of the biomedical and behavioral research workforce.

Lorsch came to NIGMS from the Johns Hopkins University School of Medicine, where he was a professor in the Department of Biophysics and Biophysical Chemistry. He joined the Johns Hopkins faculty in 1999 and became a full professor in 2009.

A leader in RNA biology, Lorsch studies the initiation of translation, a major step in controlling how genes are expressed. When this process goes awry, viral infection, neurodegenerative diseases and cancer can result. To dissect the mechanics of translation initiation, Lorsch and collaborators developed a yeast-based system and a wide variety of biochemical and biophysical methods. The work also has led to efforts to control translation initiation through chemical reagents, such as drugs.

NIGMS supported Lorsch's research from 2000-2013. He also received grants from NIH's National Institute of Diabetes and Digestive and Kidney Diseases and National Institute of Mental Health, as well as from other funding organizations.

Lorsch is as passionate about education as he is about research. During his tenure at Johns Hopkins, he helped reform the curricula for graduate and medical education, spearheaded the development of the Center for Innovation in Graduate Biomedical Education, and launched a program offering summer research experiences to local high school students, many from groups that are underrepresented in the biomedical and behavioral sciences. In addition, he advised dozens of undergraduate and graduate students and postdoctoral fellows.

Lorsch received a B.A. in chemistry from Swarthmore College in 1990 and a Ph.D. in biochemistry from Harvard University in 1995, where he worked in the laboratory of Jack Szostak, Ph.D. He conducted postdoctoral research at Stanford University in the laboratory of Daniel Herschlag, Ph.D.

Lorsch is the author of more than 60 peer-reviewed research articles, book chapters and other papers. He has also been the editor of three volumes of *Methods in Enzymology* and a reviewer for numerous scientific journals. He has one patent and one patent application related to his translation research. His honors include six teaching awards from Johns Hopkins.

Lorsch's other activities include membership on the American Society for Biochemistry and Molecular Biology's mentoring committee, the RNA Society's board of directors and NIH review committees.

NIGMS DIRECTORS

Name	In Office from	To
Clinton C. Powell	July 1962	July 1964
Frederick L. Stone	August 1964	April 1970
DeWitt Stetten, Jr.	October 1970	August 1974
Ruth L. Kirschstein	September 1974	July 1993
Marvin Cassman (Acting)	July 1993	August 1996
Marvin Cassman	August 1996	May 2002
Judith H. Greenberg (Acting)	May 2002	November 2003
Jeremy M. Berg	November 2003	July 2011
Judith H. Greenberg (Acting)	July 2011	July 2013
Jon R. Lorsch, Ph.D.	August 2013	Present

MAJOR PROGRAMS

Division of Biomedical Technology, Bioinformatics, and Computational Biology

The Division of Biomedical Technology, Bioinformatics, and Computational Biology (BBCB) supports studies in and tools for understanding complex biological systems. The research and training it funds join biology with the computer sciences, engineering, mathematics and physics. The long-term goals of the division are to leverage data and technologies to answer fundamental questions about biology and to develop a more robust computing infrastructure for the biomedical research community. The division also defines NIGMS' needs for database development and applications as well as for a broad spectrum of biomedical technologies, techniques and methodologies. It collaborates with other NIH components and Federal agencies in developing policies in these areas. The division has two components: the Biomedical Technology Branch and the Bioinformatics and Computational Biology Branch.

Biomedical Technology

This branch supports research to discover, create and develop innovative technologies for biomedical research. Areas of interest include, but are not limited to, high-performance computing, molecular imaging, structural biology and proteomics. The branch provides this support through biomedical technology research centers, a research network, instrument development for biomedical applications, investigator-initiated research grants and small business grants.

Bioinformatics and Computational Biology

The bioinformatics component of this branch supports research to develop algorithms and tools for managing, visualizing and analyzing scientific data sets. It also identifies Institute needs for database development and creates opportunities for maintaining the most critical ones, and it encourages the adoption of software engineering best practices and rigorous statistical analyses in NIGMS-funded research.

The computational biology component of the branch supports research in modeling, such as the Models of Infectious Disease Agent Study (MIDAS), and systems biology, such as the National Centers for Systems Biology. The branch also fosters the use of systems biology approaches to study complex systems from the subcellular to physiological and population scales, the development of modeling and simulation tools across NIGMS mission areas, and the advancement of methods for analyzing and disseminating computational models.

Division of Cell Biology and Biophysics

The Division of Cell Biology and Biophysics seeks greater understanding of the structure and function of cells, cellular components, and the biological macromolecules that make up these components. The research it supports ranges from studies of single molecules to work in structural genomics and proteomics. The long-term goal of the division is to better understand the basic structures and processes in living cells. This information may lay the foundation for ways to prevent, treat, and cure diseases that result from disturbed or abnormal cellular activity. The division has 3 components: the Biophysics Branch, the Cell Biology Branch, and the Structural Genomics and Proteomics Technology Branch.

Biophysics Branch

This branch supports studies in the areas of biophysics, a discipline that uses techniques derived from the physical sciences to examine the structures and properties of biological molecules. Areas of emphasis in biophysical research include the determination of the structures of proteins and nucleic acids; studies of the physical features that determine macromolecular conformation; the analysis of macromolecular interactions and of ligand-macromolecular interactions; bioinformatics as it relates to protein and nucleic acid structure; the development of physical methodology for the analysis of molecular structure; and the development and use of theoretical methods to investigate biological systems. Other research interests include the development and refinement of instruments needed to conduct research in the areas described above. These include nuclear magnetic resonance spectroscopy, X-ray crystallography and other scattering techniques, optical spectroscopy and other forms of microscopy. This branch also supports the development of new bioanalytical methods and biomaterials.

Cell Biology Branch

This branch supports general studies on the molecular and biochemical activities of cells and subcellular components, as well as on the role of cellular dysfunction in disease. Emphasis is placed on research with applications to a range of cell types, model systems, or disease states, as well as research that does not fall within the disease-oriented mission of one of the other NIH institutes or centers. Representative studies include those on plasma and intracellular membranes, receptors, and signal transduction mechanisms; the structure and function of the cytoskeleton; cell motility; the regulation of protein and membrane synthesis and the activation of cell growth; subcellular organelles; cell division; and lipid biochemistry.

Structural Genomics and Proteomics Technology Branch

This branch supports studies that take a genomics or computational approach to determining protein structures and functions. Such research includes the development of high-throughput methods for protein structure determination, bioinformatics as it relates to the analysis of protein structures *en masse*, and the development of mass spectroscopy and other tools for the rapid analysis of biological molecules. The branch is responsible for monitoring the research centers and research grants associated with the NIGMS Protein Structure Initiative (PSI). This responsibility also includes developing a database of model structures and a repository for the distribution of materials resulting from the PSI.

Division of Genetics and Developmental Biology

The Division of Genetics and Developmental Biology supports studies directed toward gaining a better understanding of the cellular and molecular mechanisms that underlie inheritance and development. The results of these studies form the foundation for advances in diagnosing, preventing, treating, and curing human genetic and developmental disorders. Most of the projects supported by the division make use of model organisms, which speed advances in understanding human biological processes.

The division consists of the Genetic Mechanisms Branch and the Developmental and Cellular Processes Branch.

Genetic Mechanisms Branch

This branch focuses on DNA and on the flow of information from genetic material (DNA or RNA) to protein. The branch supports mechanistic studies of DNA replication and repair; synthesis of DNA, RNA, and protein; regulation of DNA replication, transcription of coding and non-coding RNA, RNA processing and protein synthesis; and interactions among these basic cellular processes. The emphasis is on the general principles governing these processes rather than on the expression of specific genes in relation to organismal phenotypes or disease. Consistent with its focus on DNA, the branch also supports studies of population genetics and evolution.

Developmental and Cellular Processes Branch

This branch focuses on the genetic and biochemical pathways that cells utilize in development and in normal physiological processes. The research supported by the branch spans the spectrum from the genetic basis of development and cell function to biochemical signaling pathways that underlie normal cell physiology. The branch supports studies of cell cycle control; mechanisms of cell death; regulation of cell growth, differentiation, and homeostasis; adaptive responses to stress; stem cell biology; microbial symbiotic relationships and community ecology; developmental genetics; neurogenetics and the genetics of behavior; chromosome structure and epigenetic regulation of gene expression; and the genetic basis of human biology.

Along with its research and research training activities, the division supports the Human Genetic Cell Repository, which maintains and distributes cell lines and DNA samples—from people with and without genetic disorders—to research scientists.

Division of Pharmacology, Physiology, and Biological Chemistry

The Division of Pharmacology, Physiology, and Biological Chemistry supports a broad spectrum of research and research training aimed at improving the molecular-level understanding of fundamental biological processes and discovering approaches to their control. Research supported by the division takes a multifaceted approach to problems in pharmacology, physiology, biochemistry, and biorelated chemistry that are either very basic in nature or that have implications for more than one disease area. The goals of supported research include an improved understanding of drug action and mechanisms of anesthesia; pharmacogenetics/pharmacogenomics and mechanisms underlying individual responses to drugs; new methods and targets for drug discovery; advances in natural products synthesis; an enhanced understanding of biological catalysis; a greater knowledge of metabolic regulation and fundamental physiological processes; and the integration and application of basic physiological, pharmacological, and biochemical research to clinical issues in anesthesia, clinical pharmacology, and trauma and burn injury. Among the division's leading areas of interest are quantitative and systems pharmacology, improved synthesis and availability of complex carbohydrates, and genomic studies of natural product biosynthesis. There are 2 components in this division: the Biochemistry and Biorelated Chemistry Branch and the Pharmacological and Physiological Sciences Branch.

Biochemistry and Biorelated Chemistry Branch

This branch supports basic research in areas of biochemistry, such as enzyme catalysis and regulation, bioenergetics and redox biochemistry, and glycoconjugates. It also supports research in areas of biorelated chemistry, such as organic synthesis and methodology, as well as bioinorganic and medicinal chemistry. Examples of biochemical investigations include studies of the chemical basis of the regulation and catalytic properties of enzymes, intermediary metabolism, the chemical and physical properties of the cellular systems for electron transport and energy transduction, and the biosynthesis and structure of carbohydrate-containing macromolecules. Examples of chemical investigations include the development of strategies for natural products synthesis, studies of the structure and function of small molecules, the chemistry of metal ions in biological systems, the development of novel medicinal agents or mimics of macromolecular function, and the creation of new synthetic methodologies. The branch also supports studies in biotechnology. This work focuses on the development of biological catalysts, including living organisms, for the production of useful chemical compounds, medicinal or diagnostic agents, or probes of biological phenomena.

Pharmacological and Physiological Sciences Branch

This branch supports research in pharmacology, anesthesiology, and the physiological sciences. Studies range from the molecular to the organismal level, and can be clinical in nature. In the pharmacological sciences and anesthesiology, important areas being studied are the effects of drugs on the body and the body's effects on drugs, as well as how these effects vary from individual to individual. This includes traditional investigations of the absorption, transport, distribution, metabolism, biotransformation, and excretion of drugs, as well as drug delivery strategies and determinants of bioavailability. It also includes a newer focus on pharmacogenetics/pharmacogenomics, linking phenotype to genotype in drug action. Understanding the mechanisms of drug interactions with receptors and signal transduction mechanisms is another major focus of this section. This includes studies of soluble and membrane-bound receptors and channels, secondary and tertiary messenger systems, mediator molecules, and their regulation and pharmacological manipulation. Examples of studies in the physiological sciences include basic and clinical investigations directed toward improving understanding of the total body response to injury, including the biochemical and physiological changes induced by trauma. Research supported in this section includes studies on the etiology of post-traumatic sepsis and the mechanisms of immunosuppression, wound healing, and hypermetabolism following injury. This section also supports research in basic molecular immunobiology, which focuses on using cells of the immune system to study fundamental cellular and molecular mechanisms.

Division of Training, Workforce Development, and Diversity

The Division of Training, Workforce Development, and Diversity supports programs that foster research training and the development of a strong and diverse biomedical research workforce. The division funds research training, career development, diversity and capacity-building activities through a variety of programs at the undergraduate, graduate, postdoctoral, faculty and institutional levels.

The division offers support in several areas: undergraduate and predoctoral training, postdoctoral training and capacity building.

Undergraduate and Predoctoral Training

This branch supports research training programs for undergraduate and predoctoral students, including those from populations that have traditionally been underrepresented in the biomedical and behavioral research workforce.

Postdoctoral Training

This branch supports research training, fellowships and career development programs for postdoctoral scientists. It also supports studies on interventions that promote student interest in research careers, and it provides supplements to research grants that promote scientific workforce diversity by offering research experiences for students at all levels, from high school through the postdoctoral stage.

Capacity Building

This branch offers a number of programs aimed at increasing the research capabilities of institutions and the research competitiveness of faculty at institutions with substantial enrollments of students from underrepresented groups and those in states that have historically not received significant levels of research funding from NIH.

Division of Extramural Activities

The Division of Extramural Activities is responsible for the grant-related activities of the Institute, including the receipt, referral, and advisory council review of applications as well as grant funding and management. It maintains an overview of the Institute's scientific and financial status and advises the NIGMS director and other key staff on policy matters and on the planning, development, and scientific administration of Institute research and training programs. The division recommends budget allocations for the various NIGMS programs. It also acts as a liaison with other NIH components for activities relating to grant application assignments and foreign grants.

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National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

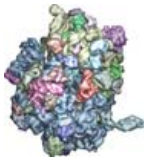
Recent Photos from the National Institute of General Medical Sciences (NIGMS)

For more scientific images, illustrations, and videos, visit the NIGMS Image Gallery.

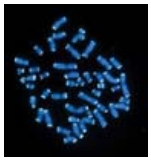
2010 PHOTOS

Long-time NIGMS grantee Ei-ichi Negishi shared the 2010 Nobel Prize in chemistry with Richard F. Heck and Akira Suzuki for developing carbon-carbon bond-forming methods. The methods, now widely used in the production of substances ranging from medicines to plastics, let scientists bring two molecules very close together. This allows the molecules to couple, form a compound with a new carbon-carbon bond, release the product and be ready for another cycle. To date, NIGMS has supported the research of 74 Nobel Prize winners. (Structure image courtesy of PubChem)
lo-res | hi-res

2009 PHOTOS

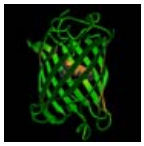


NIH grantees Venkatraman Ramakrishnan, Thomas A. Steitz, and Ada E. Yonath shared the 2009 Nobel Prize in chemistry for their “studies of the structure and function of the ribosome.” Ribosomes are the molecular factories that manufacture proteins in humans and other organisms. Knowing the structure and function of the ribosome has helped us understand one of life's most fundamental processes and manipulate it—many of our antibiotics work by disrupting bacterial ribosomes. (Image courtesy of Catherine Lawson, Rutgers University, and the RCSB Protein Data Bank.)
lo-res | hi-res



NIH grantees Elizabeth H. Blackburn, Carol W. Greider, and Jack W. Szostak shared the 2009 Nobel Prize in physiology or medicine for their discovery of "how chromosomes are protected by telomeres and the enzyme telomerase." Like the plastic tips of shoelaces, telomeres protect chromosomes and the genetic information they contain. We now know that these chromosomal caps play critical roles in human health and disease. (Image courtesy of Hesed Padilla-Nash and Thomas Ried.)
lo-res | hi-res

2008 PHOTOS



NIH grantees Martin Chalfie and Roger Y. Tsien shared the 2008 Nobel Prize in chemistry with former grantee Osamu Shimomura for their groundbreaking work on green fluorescent protein. This naturally glowing protein found in jellyfish has become a powerful tool for studying molecules inside living cells. (Image courtesy of Roger Tsien, Univeristy of California, San Diego)
lo-res | hi-res

2007 PHOTOS

This model of the enzyme nicotinic acid phosphoribosyltransferase is one of more than 2,000 protein structures solved as part of NIGMS's Protein Structure Initiative. Although the enzyme is from a bacterium, its amino acid sequence suggests that it is structurally similar to a clinically important human protein called B-cell colony enhancing factor. (Image courtesy of Berkeley Structural Genomics Center)
lo-res | hi-res

Hailed as a scientific breakthrough, NIGMS grantee James Thomson used human skin cells to create ones that appear to be indistinguishable from embryonic stem cells. In 2007, Thomson and his colleagues reported that they'd reset the skin cells to the embryonic state by supplying them with 4 genes, giving them the potential to become any of the 220 cell types in the body. The new technique is expected to bring stem cells within easier reach of more scientists, providing them with better models for studying many human diseases and possibly speeding the advent of cell-based therapies for conditions such as diabetes and arthritis. This work also was supported by NIH's National Center for Research Resources (NCRR). (Image courtesy of Junying Yu, University of Wisconsin-Madison)
lo-res | hi-res

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U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

National Institute of Mental Health

Mission | Important Events | Legislative Chronology | Director | Programs | Photo Gallery

MISSION

The mission of the National Institute of Mental Health (NIMH) is to transform the understanding and treatment of mental illnesses through basic and clinical research, paving the way for prevention, recovery, and cure.

For the Institute to continue fulfilling this vital public health mission, it must foster innovative thinking and ensure that a full array of novel scientific perspectives are used to further discovery in the evolving science of brain, behavior, and experience. In this way, breakthroughs in science can become breakthroughs for all people with mental illnesses.

In support of this mission, NIMH will generate research and promote research training to fulfill the following 4 objectives:

- Promote discovery in the brain and behavioral sciences to fuel research on the causes of mental disorders
- Chart mental illness trajectories to determine when, where, and how to intervene
- Develop new and better interventions that incorporate the diverse needs and circumstances of people with mental illnesses
- Strengthen the public health impact of NIMH-supported research

To reach these goals, NIMH divisions and programs are designed to emphasize translational research spanning bench, to bedside, to practice.

IMPORTANT EVENTS IN NIMH HISTORY

1946—On July 3 President Harry Truman signed the National Mental Health Act, which called for the establishment of a National Institute of Mental Health. The first meeting of the National Advisory Mental Health Council was held on August 15. Because no federal funds had yet been appropriated for the new institute, the Greentree Foundation financed the meeting.

1947—On July 1 the U.S. Public Health Service (PHS) Division of Mental Hygiene awarded the first mental health research grant (MH-1) entitled "Basic Nature of the Learning Process" to Dr. Winthrop N. Kellogg of Indiana University.

1949—On April 15 NIMH was formally established; it was 1 of the first 4 NIH institutes.

1955—The Mental Health Study Act of 1955 (Public Law 84-182) called for "an objective, thorough, nationwide analysis and reevaluation of the human and economic problems of mental health." The resulting Joint Commission on Mental Illness and Health issued a report, *Action for Mental Health,* that was researched and published under the sponsorship of 36 organizations making up the Commission.

1961—*Action for Mental Health*, a 10-volume series, assessed mental health conditions and resources throughout the United States "to arrive at a national program that would approach adequacy in meeting the individual needs of the mentally ill people of America." Transmitted to Congress on December 31, 1960, the report commanded the attention of President John F. Kennedy, who established a cabinet-level interagency committee to examine the recommendations and determine an appropriate Federal response.

1963—President Kennedy submitted a special message to Congress—the first Presidential message to Congress on mental health issues. Energized by the President's focus, Congress quickly passed the Mental Retardation Facilities and Community Mental Health Centers Construction Act (P.L. 88-164), beginning a new era in Federal support for mental health services. NIMH assumed responsibility for monitoring the Nation's community mental health centers (CMHC) programs.

1965—During the mid-1960s, NIMH launched an extensive attack on special mental health problems. Part of this was a response to President Johnson's pledge to apply scientific research to social problems. The Institute established centers for research on schizophrenia, child and family mental health, and suicide, as well as crime and delinquency, minority group mental health problems, urban problems, and later, rape, aging, and technical assistance to victims of natural disasters. A

provision in the Social Security Amendments of 1965 (P.L. 89-97) provided funds and a framework for a new Joint Commission on the Mental Health of Children to recommend national action for child mental health.

Also in this year, staffing amendments to the CMHC act authorized grants to help pay the salaries of professional and technical personnel in federally funded community mental health centers.

Alcohol abuse and alcoholism did not receive full recognition as a major public health problem until the mid-1960s, when the National Center for Prevention and Control of Alcoholism was established as part of NIMH; a research program on drug abuse was inaugurated within NIMH with the establishment of the Center for Studies of Narcotic and Drug Abuse.

1967—NIMH separated from NIH and was given Bureau status within PHS by reorganization effective January 1. However, NIMH's intramural research program, which conducted studies in the NIH Clinical Center and other NIH facilities, remained at NIH under an agreement for joint administration between NIH and NIMH.

On August 13 U.S. Department of Health, Education, and Welfare (HEW) Secretary John W. Gardner transferred St. Elizabeth's Hospital, the Federal government's only civilian psychiatric hospital, to NIMH.

1968—NIMH became a component of PHS's Health Services and Mental Health Administration (HSMHA).

1970—Dr. Julius Axelrod, an NIMH researcher, won the Nobel Prize in Physiology or Medicine for research into the chemistry of nerve transmission for "discoveries concerning the humoral transmitters in the nerve terminals and the mechanisms for their storage, release, and inactivation." He found an enzyme that stopped the action of the nerve transmitter noradrenaline—a critical target of many antidepressant drugs—in the synapse.

In a major development for people with manic-depressive illness (bipolar disorder), the U.S. Food and Drug Administration (FDA) approved the use of lithium as a treatment for mania, based on NIMH research. The treatment led to sharp drops in inpatient days and suicides among people with this serious mental illness and to immense reductions in the economic costs associated with bipolar disorder.

Also during this year, the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment, and Rehabilitation Act (P.L. 91-616) established the National Institute of Alcohol Abuse and Alcoholism within NIMH.

1972—The Drug Abuse Office and Treatment Act established a National Institute on Drug Abuse within NIMH.

1973—NIMH went through a series of organizational moves. The Institute temporarily rejoined NIH on July 1 with the abolishment of HSMHA. Then, the HEW secretary administratively established the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA)—composed of the National Institute on Alcohol Abuse and Alcoholism (NIAAA), the National Institute on Drug Abuse (NIDA), and NIMH—as the successor organization to HSMHA.

1974—ADAMHA was officially established on May 4 when President Nixon signed P.L. 93-282.

1975—The community mental health centers program was given added impetus with the passage of the CMHC amendments of 1975.

1977—President Jimmy Carter established the President's Commission on Mental Health on February 17 by Executive Order No. 11973. The commission was charged to review the mental health needs of the Nation, and to make recommendations to the President as to how best to meet these needs. First Lady Rosalyn Carter served as the Honorary Chair of the commission.

1978—The 4-volume Report to the President from the President's Commission on Mental Health was submitted.

1980—The Epidemiologic Catchment Area (ECA) study, an unprecedented research effort that entailed interviews with a nationally representative sample of 20,000 Americans, was launched. The field interviews and first-wave analyses were completed in 1985. Data from the ECA provided an accurate picture of rates of mental and addictive disorders and services usage.

The Mental Health Systems Act—based on recommendations of the President's Commission on Mental Health and designed to provide improved services for persons with mental disorders—was passed. NIMH also participated in development of the National Plan for the Chronically Mentally Ill, a sweeping effort to improve services and fine-tune various Federal entitlement programs for those with severe, persistent mental disorders.

1981—President Ronald Reagan signed the Omnibus Budget Reconciliation Act of 1981. This act repealed the Mental Health Systems Act and consolidated ADAMHA's treatment and rehabilitation service programs into a single block grant that enabled each State to administer its allocated funds. With the repeal of the community mental health legislation and the establishment of block grants, the Federal role in services to the mentally ill became one of providing technical assistance to increase the capacity of State and local providers of mental health services.

Dr. Louis Sokoloff, an intramural NIMH researcher, received the Albert Lasker Award in Clinical Medical Research for developing a new method of measuring brain function that contributed to basic understanding and diagnosis of brain diseases. His technique, which measures the brain's use of glucose, made possible exciting new applications to positron emission tomography, or PET scanning, the first imaging technology that permitted scientists to "observe" and obtain visual images of the living, functioning brain.

Dr. Roger Sperry, a longtime NIMH research grantee, received the Nobel Prize in Medicine or Physiology for discoveries regarding the functional specialization of the cerebral hemispheres, or the "left" and "right" brain.

1983—NIMH-funded investigator Fernando Nottebohm discovered the formation of new neurons in brains of adult song-birds; this evidence of "neurogenesis" opened an exciting and clinically promising new line of research in brain science. It was 15 years, however, before investigators reported finding evidence for continued

neurogenesis in the brains of adult human subjects.

1987—Administrative control of St. Elizabeth's Hospital is transferred from the NIMH to the District of Columbia. NIMH retained research facilities on the grounds of the hospital.

1989—Congress passed a resolution, subsequently signed as a proclamation by President George Bush, designating the 1990s as the "Decade of the Brain."

The NIMH Neuroscience Center and the NIMH Neuropsychiatric Research Hospital, located on the grounds of St. Elizabeth's Hospital, were dedicated on September 25.

1992—Congress passed the ADAMHA Reorganization Act (P.L. 102-321), abolishing ADAMHA. The research components of NIAAA, NIDA, and NIMH rejoined NIH, while the services components of each institute became part of a new PHS agency, the Substance Abuse and Mental Health Services Administration (SAMHSA). The return to NIH and the loss of services functions to SAMHSA necessitated a realignment of the NIMH extramural program administrative organization. New offices are created for research on Prevention, Special Populations, Rural Mental Health, and AIDS.

1993—NIMH established the Silvio O. Conte Centers program to provide a unifying research framework for collaborations to pursue newly formed hypotheses of brain-behavior relationships in mental illness through innovative research designs and state-of-the-art technologies.

NIMH established the Human Brain Project to develop—through cutting-edge imaging, computer, and network technologies—a comprehensive neuroscience database accessible via an international computer network.

1994—Intramural Research Program Revitalization—The House Appropriations Committee mandated that the director of NIH conduct a review of the role, size, and cost of all NIH intramural research programs. NIMH and the National Advisory Mental Health Council initiated a major study of the NIMH Intramural Research Program. The planning committee recommended continued investment in the Intramural Research Program and recommended specific administrative changes; many of these were implemented upon release of the committee's final report. Other changes—for example, the establishment of a major new program on Mood and Anxiety Disorders—have been introduced in the years since.

1996—NIMH, with the National Advisory Mental Health Council, initiated systematic reviews of several areas of its research portfolio, including the genetics of mental disorders; epidemiology and services for child and adolescent populations; prevention research; clinical treatment; and services research. At the request of the NIMH director, the Council established programmatic groups in each of these areas. NIMH continued to implement recommendations issued by these work groups.

NIMH increased the priority placed on research on childhood mental disorders and clinical neuroscience and initiated efforts to expand research in these areas.

NIMH expanded its efforts to safeguard and improve the protections of human subjects who participate in clinical mental health research.

1996-1998—NIMH initiated planning for integration of the Institute's peer review system for neuroscience, behavioral and social science, and AIDS research applications into the overall NIH peer review system.

1997—NIMH realigned its extramural organizational structure to capitalize on new technologies and approaches to both basic and clinical science, as well as immense changes to health care delivery systems, while retaining the Institute's focus on mental illness. The new extramural organization resulted in 3 research divisions: Basic and Clinical Neuroscience Research; Services and Intervention Research; and Mental Disorders, Behavioral Research, and AIDS.

1997-1999—NIMH refocused career development resources on early careers and added new mechanisms for clinical research.

1999—The NIMH Neuroscience Center/Neuropsychiatric Research Hospital was relocated from St. Elizabeth's Hospital in Washington, DC to the NIH Campus in Bethesda, MD, in response to the recommendations of the 1996 review of the NIMH Intramural Research Program by the IRP Planning Committee.

The first White House Conference on Mental Health, held June 7 in Washington, DC, brought together national leaders, mental health scientific and clinical personnel, patients, and consumers to discuss needs and opportunities. NIMH developed materials and helped organize the conference.

NIMH convened its fourth rural mental health research conference in August. "Mental Health at the Frontier: Alaska," was held in Anchorage, with visits by researchers and program representatives to several towns and villages. The aim was to solicit assistance in the development of a research agenda focusing on mental health issues for people who live in rural or frontier areas, with a focus on the needs of Alaska Natives.

NIMH hosted "Dialogue: Texas," which was the first in a series of mental health forums to solicit input from the public on the direction of future research at NIMH and to highlight current research. Held in San Antonio, the forum provided Texas consumers, researchers, care providers, and policymakers the opportunity to discuss mental health issues of greatest concern. The meeting focused on Latino and Hispanic populations.

U.S. Surgeon General David Satcher released *The Surgeon General's Call To Action To Prevent Suicide*, in July, and the first Surgeon General's Report on Mental Health, in December. NIMH, along with other Federal agencies, collaborated in the preparation of both of these landmark reports.

In the late 1990s, NIMH began to strengthen its efforts to include the public in its priority setting and strategic planning processes, instituting a variety of approaches to ensure increased public participation.

The NIMH expanded and revitalized its public education and prevention information dissemination programs, including information on suicide, eating disorders, and panic disorder, in addition to the ongoing Institute educational program, Depression: Awareness, Recognition, and Treatment (D/ART).

NIMH also launched an initiative to educate people about anxiety disorders, to decrease stigma and trivialization of these disorders, and to encourage people to seek

treatment promptly.

NIMH included members of the public on its scientific review committees reviewing grant applications in the clinical and services research areas.

2000—NIMH created the Council Work Group on Training for Diversity in February to ensure adequate opportunities for minorities to pursue research careers, and to track the success of related Institute programs.

NIMH launched a 5-year communications initiative in March called the Constituency Outreach and Education Program, enlisting nationwide partnerships with state organizations to disseminate science-based mental health information to the public and health professionals, and increase access to effective treatments.

In March, NIMH assisted First Lady Hillary Rodham Clinton in conducting a meeting on the Safe Use of Medication to Treat Young Children.

NIMH co-hosted 2 town meetings in Chicago on the mental health needs of minority youth and related research. The first meeting, held in April, focused on behavioral, emotional, and cognitive disorders; the impact of violence; the criminalization of youth with treatment needs; service system issues; barriers to treatment; and barriers to research. The July 2000 meeting addressed the prevention of sexually transmitted diseases, such as HIV, and the role of the family and society in stemming the spread of HIV, as well as the increase in violence. Members of the general public, parents, teachers, school officials, guidance counselors, and professionals in the health, family assistance, social services, and juvenile justice fields attended the meetings.

NIMH organized the 14th International Conference on Challenges for the 21st Century: Mental Health Services Research, held in Washington, DC in July, to address how to meet mental health service needs nationwide most effectively,reduce health disparities, and provide equitable treatments in an era of managed care.

Dr. Eric Kandel and Dr. Paul Greengard, each of whom has received NIMH support for more than 3 decades, shared the Nobel Prize in Physiology or Medicine with Sweden's Dr. Arvid Carlsson. Dr. Kandel received the prize for his elucidating research on the functional modification of synapses in the brain. Initially using the sea slug as an experimental model but later working with mice, he established that the formation of memories is a consequence of short- and long-term changes in the biochemistry of nerve cells. Further, he and his colleagues showed that these changes occur at the level of synapses. Dr. Greengard was recognized for his discovery that dopamine and several other transmitters can alter the functional state of neuronal proteins. These findings made it clear that signaling between neurons could alter their function not only in the short term but also in the long term. Also, he learned, such changes could be reversed by subsequent environmental signals.

Dr. Nancy Andreasen, a psychiatrist and long-time NIMH grantee, receives the National Medal of Science for her groundbreaking work in schizophrenia and for joining behavioral science with neuroscience and neuroimaging. The Presidential Award is one of the nation's highest awards in science.

2001—In Pittsburgh, NIMH convened more than 150 clinical and basic scientists with expertise relevant to the study of mood disorders to help develop a Research Strategic Plan for Mood Disorders. A public forum held in conjunction with the meeting focused on the frequent co-occurrence of depression with general medical illnesses.

NIMH launched several long-term, large-scale, multi-site, community-based clinical studies to determine the effectiveness of treatment for bipolar disorder (also called manic-depressive illness); depression in adolescents; antipsychotic medications in the treatment of schizophrenia, and management of psychotic symptoms and behavioral problems associated with Alzheimer's disease; and subsequent treatment alternatives to relieve depression.

The Surgeon General released a Report on Children's Mental Health indicating that the nation is facing a public crisis in the mental health of children and adolescents. The National Action Agenda outlines goals and strategies to improve services for children and adolescents with mental and emotional disorders. NIMH, along with other Federal agencies, collaborated in the preparation of this report.

2002—NIMH published a national conference report entitled "Mental Health and Mass Violence: Evidence-Based Early Psychological Intervention for Victims/Survivors of Mass Violence: A Workshop to Reach Consensus on Best Practices." While most people recover from a traumatic event in a resilient fashion, the report indicates that early psychological intervention guided by qualified mental health caregivers can reduce the harmful psychological and emotional effects of exposure to mass violence in survivors. NIMH and the Department of Defense, along with other Federal agencies and the Red Cross, collaborated in the preparation of this report.

2003—Real Men. Real Depression campaign launched to raise awareness about depression in men and create an understanding of the signs, symptoms, and available treatments. The campaign was designed to inspire other men to seek help after hearing from real men talking about their experiences with depression, treatment, and recovery.

NIMH, in collaboration with the University of New Mexico, hosted a regional public outreach meeting, Dialogue Four Corners, in April that focused on the Four Corners area of New Mexico, Arizona, Colorado, and Utah. Over 350 stakeholders—including consumers and their families, health care providers, policy makers, advocates, and researchers—gathered to discuss the impact of mental illness on American Indian and Hispanic populations living in rural communities and to help NIMH shape its future research agenda on issues relevant to the region.

2004—The Treatment of Adolescent Depression Study (TADS), one of NIMH's 4 large-scale practical clinical trials, yielded important first phase results. The clinical trial of 439 adolescents with major depression found a combination of medication and psychotherapy to be the most effective treatment over the course of the 12-week study. The study compared cognitive-behavioral therapy with fluoxetine, currently the only antidepressant approved by the FDA for use in children and adolescents.

2005—Results from the first phase of the Clinical Antipsychotic Trials of Intervention Effectiveness research program (CATIE), the second of NIMH's 4 large-scale practical clinical trials, provided, for the first time, detailed information comparing the effectiveness and side effects of 5 medications—both new and older medications—that are currently used to treat people with schizophrenia. Overall, the medications were comparably effective but were associated with high rates of discontinuation due to intolerable side effects or failure to control symptoms adequately. Surprisingly, the older, less expensive medication used in the study generally performed as well as the newer medications. The NIMH-funded study included more than 1,400 people.

NIMH and the National Alliance for Research on Schizophrenia and Depression (NARSAD) collaborated to help launch the Schizophrenia Research Forum, an online resource—www.schizophreniaforum.org—that aims to advance research in schizophrenia and related diseases. NARSAD is one of the largest donor-supported organizations that funds research on the brain and behavioral disorders.

In the first few weeks after Hurricane Katrina, and later Hurricane Rita, staff from NIMH traveled to the southern Gulf Coast region to provide immediate mental health treatment and prevention services to storm survivors and emergency response staff serving affected communities. In total, NIMH sent 26 scientists, clinicians, nurses, and social workers. Staff provided care to city police and fire squads, allowing these men and women to continue to perform vital services to the city. Others provided treatment assessment and evaluation for children and adolescents who were evacuated from the Mississippi gulf area.

2006—NIMH launched the inaugural edition of *Inside NIMH*, a new electronic newsletter designed to be published three times each year following meetings of the National Advisory Mental Health Council. The e-newsletter provides the latest news on funding opportunities and policies at NIMH, as well as highlights of research breakthroughs, new tools for mental health research, and public education efforts.

At the open session of the September meeting of NIMH's National Advisory Mental Health Council, Dr. John March, principal investigator of NIMH's TADS program, provided the latest findings of the study, which suggested that even after 18 weeks, the combination of medication and psychotherapy continued to provide the fastest, most effective outcome. Psychotherapy alone could be a viable option for adolescents unable to take medication, but required 6 extra months to achieve the same improvement as treatments involving medication.

Results from the first phase of NIMH's CATIE study focused on Alzheimer's disease yielded evidence that commonly prescribed antipsychotic medications used to treat Alzheimer's patients with delusions, aggression, hallucinations, and other similar symptoms can benefit some patients, but they appear to be no more effective than a placebo when adverse side effects are considered. The study provided the first real-world test of antipsychotic medications prescribed for these patients.

Results from the NIMH-funded Sequenced Treatment Alternatives to Relieve Depression (STAR*D) research program, the nation's largest clinical trial for depression (and the third of NIMH's 4 practical clinical trials), reported a series of results over the course of the year. The program included 2,876 participants. Phase 1 results, which used flexible adjustment of dosages based on quick and easy-to-use clinician ratings of symptoms and patient self-ratings of side effects, helped clinicians to track "real world" patients who became symptom-free and to identify those who were resistant to the initial treatment over the course of 14 weeks. Phase 2 results showed that 1 in 3 depressed patients who previously did not achieve remission using an antidepressant became symptom-free with the help of an additional medication and 1 in 4 achieved remission after switching to a different antidepressant. Phases 3 and 4 together showed that patients with treatment-resistant depression had a modest chance of becoming symptom-free when they tried different treatment strategies after 2 or 3 failed treatments.

Dr. Aaron T. Beck—professor emeritus of psychiatry at the University of Pennsylvania, the founder of cognitive therapy, and a long-time NIMH grantee—was named the recipient of the prestigious Lasker Award for Clinical Medical Research.

2007—Building on previous research, several studies in the NIMH Intramural Research Program have shown that the drug ketamine relieves depression within hours and helped to clarify a possible mechanism behind this finding. While ketamine itself probably won't come into use as an antidepressant because of its side effects, the new results move scientists considerably closer to understanding how to develop faster-acting antidepressant medications. Current medications to treat depression can take weeks to have an effect.

Findings from another NIMH clinical study—The Systematic Treatment Enhancement Program for Bipolar Disorder (STEP-BD)—revealed that people receiving medication treatment for bipolar disorder are more likely to get well faster and stay well if they also receive intensive psychotherapy.

A simulation study, conducted by Dr. Philip Wang of Harvard University (currently at NIMH) and colleagues, revealed that providing a minimal level of enhanced care for employees' depression would result in a cumulative savings to employers of $2,898 per 1,000 workers over 5 years. Savings from reduced absenteeism and employee turnover and other benefits of the intervention began to exceed the costs of the program by the second year, yielding a net savings of $4,633 per 1,000 workers.

2008—NIMH began implementation of a new Strategic Plan (View Image.) with 4 major objectives:

- Promote discovery in the brain and behavioral sciences to fuel research on the causes of mental disorders
- Chart mental illness trajectories to determine when, where, and how to intervene
- Develop new and better interventions that incorporate the diverse needs and circumstances of people with mental illnesses
- Strengthen the public health impact of NIMH-supported research

NIMH's Dr. Linda Brady, director of the Division of Neuroscience and Basic Behavioral Science, received the first individual Roadmap Compass Award on October 24, 2008, for her leadership and coordination of the Molecular Libraries Working Group.

NIMH and the U.S. Army entered into a memorandum of agreement (MOA) to conduct research that will help the Army reduce the rate of suicides. The MOA allows for a $50 million, multi-year study on suicide and suicidal behavior among soldiers, across all phases of Army service. It will be the largest single study on the subject of suicide that NIMH has ever undertaken. (View Image.)

Twelve NIMH staff members received the 2008 Hubert H. Humphrey Award for Service to America for their work in addressing the mental health needs of returning veterans. In an effort to address pressing scientific and public health needs related to the ongoing wars, these staff developed a new research initiative seeking grants designed to describe and evaluate national, state and local programs that address the mental health needs of returning service members and their families.

2009—Using the unprecedented additional funding made available through the American Recovery and Reinvestment Act, NIMH supported an additional $196 million in research in fiscal year 2009. Included in this amount was $33 million for research on autism. Approximately 240 additional projects were supported.

Following up to the MOU that was signed in 2008 and with $50 million in funding from the U.S. Army, NIMH launched the Army Study to Assess Risk and Resilience in Service Members (Army STARRS). Army STARRS is the largest study of suicide and mental health among military personnel ever undertaken and will identify modifiable risk and protective factors related to mental health and suicide.

NIMH LEGISLATIVE CHRONOLOGY

1929—P.L. 70-672 established 2 Federal "narcotics farms" and authorized a Narcotics Division within PHS.

1930—P.L. 71-357 redesignated the PHS Narcotics Division to the Division of Mental Hygiene.

1939—P.L. 76-19 transferred PHS from the Treasury Department to the Federal Security Agency.

1946—P.L. 79-487, the National Mental Health Act, authorized the Surgeon General to improve the mental health of U.S. citizens through research into the causes, diagnosis, and treatment of psychiatric disorders.

1949—NIMH was established April 15.

1953—Reorganization plan No. 1 assigned PHS to the newly created U.S. Department of Health, Education, and Welfare.

1955—P.L. 84-182, the Mental Health Study Act, authorized NIMH to study and make recommendations on mental health and mental illness in the U.S. The act also authorized the creation of the Joint Commission on Mental Illness and Health.

1956—P.L. 84-830, the Alaska Mental Health Enabling Act, provided for territorial treatment facilities for mentally ill individuals in Alaska.

1963—P.L. 88-164, the Mental Retardation Facilities and Community Mental Health Centers Construction Act, provided for grants for assistance in the construction of community mental health centers nationwide.

1965—P.L. 89-105, amendments to P.L. 88-164, provided for grants for the staffing of community mental health centers.

1966—P.L. 89-793, Narcotic Addict Rehabilitation Act of 1966, launched a national program for long-term treatment and rehabilitation of narcotic addicts.

1967—P.L. 90-31, Mental Health Amendments of 1967, separated NIMH from NIH and raised it to bureau status in PHS.

1968—NIMH became a component of the newly created Health Services and Mental Health Administration.

P.L. 90-574, The Alcoholic and Narcotic Addict Rehabilitation Amendments of 1968, authorized funds for the construction and staffing of new facilities for the prevention of alcoholism and the treatment and rehabilitation of alcoholics.

1970—P.L. 92-211, Community Mental Health Centers Amendments of 1970, authorized construction and staffing of centers for 3 more years, with priority on poverty areas.

P.L. 91-513, Comprehensive Drug Abuse Prevention and Control Act of 1970, expanded the national drug abuse program by extending the services of federally funded community treatment centers to non-narcotic drug abusers as well as addicts.

P.L. 91-616, Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment, and Rehabilitation Act, authorized the establishment of a National Institute on Alcohol Abuse and Alcoholism within NIMH.

1972—P.L. 92-255, Drug Abuse Office and Treatment Act of 1972, provided that a National Institute on Drug Abuse be established within NIMH.

1973—NIMH rejoined NIH.

NIMH later became a component of the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA).

1974—P.L. 93-282, authorized the establishment of ADAMHA.

1978—P.L. 95-622, the Community Mental Health Centers Extension Act of 1978.

1979—P.L. 96-88, the Department of Education Organization Act, created the Department of Education and renamed HEW the Department of Health and Human Services (HHS).

1980—P.L. 96-398, the Mental Health Systems Act, reauthorized the community mental health centers program.

1981—P.L. 97-35, the Omnibus Reconciliation Act, repealed P.L. 96-398 and consolidated ADAMHA's treatment and rehabilitation programs into a single block grant that enabled each State to administer allocated funds.

1983—P.L. 98-24, Alcohol Abuse Amendments of 1983, consolidated the current authorization for ADAMHA and the institutes into a new title V of the PHS act.

1984—P.L. 98-509, Alcohol Abuse, Drug Abuse, and Mental Health Amendments, authorized funding for block grants for fiscal years 1985 through 1987, as well as extending the authorizations for Federal activities in the areas of alcohol and drug abuse research, information dissemination, and development of new treatment

methods.

1991—P.L. 99-550, PHS act, contained the requirement for State Comprehensive Mental Health Services Plan.

1992—P.L. 102-321, the ADAMHA Reorganization Act, abolished ADAMHA, created the Substance Abuse and Mental Health Services Administration, and transferred NIMH research activities to NIH.

2000—P.L. 106-310, The Children's Health Act of 2000, Title I Autism, instructed the Director of NIH to carry out this section through the Director of NIMH and in collaboration with other agencies that the Director determined appropriate. The Act expands, intensifies, and coordinates activities of the NIH with respect to research on autism, including the establishment of not less than 5 centers of excellence that conduct basic and clinical research into autism. The Act also mandated that the Secretary, DHHS establish an Interagency Autism Coordinating Committee (IACC) to coordinate autism research and other efforts within the Department. Authority to establish the IACC was delegated to the NIH. The NIMH was designated the NIH lead for this activity.

2006—P.L. 109-416, the Combating Autism Act of 2006, authorized expanded activities related to autism spectrum disorder (ASD) related research, surveillance, prevention, treatment, and education. Specifically, the Act authorizes research under NIH to address the entire scope of ASD; authorizes a review of regional centers of excellence for autism research and epidemiology; authorizes activities to increase public awareness, improve use of evidence-based interventions, and increase early screening for autism; and calls on the Interagency Autism Coordinating Committee to enhance information sharing.

2010—P.L. 111-148, the Patient Protection and Affordable Care Act, contains a section encouraging NIMH to continue relevant research, as well as a "Sense of the Congress" authorizing the Director of NIMH to conduct a longitudinal study of the relative mental health consequences for women of resolving a pregnancy.

BIOGRAPHICAL SKETCH OF NIMH DIRECTOR, THOMAS INSEL, M.D.

Thomas R. Insel, M.D., is Director of the National Institute of Mental Health (NIMH), the component of the National Institutes of Health charged with generating the knowledge needed to understand, treat, and prevent mental disorders. With a budget of over $1.4 billion, the NIMH leads the nation's research on disorders that affect an estimated 44 million Americans, including 1 in 5 children.

Immediately prior to his appointment as Director, which marks his return to NIMH after an 8-year hiatus, Dr. Insel was professor of psychiatry at Emory University. There, he was founding director of the Center for Behavioral Neuroscience, one of the largest science and technology centers funded by the National Science Foundation and, concurrently, director of an NIH-funded Center for Autism Research. From 1994 to 1999, he was director of the Yerkes Regional Primate Research Center in Atlanta. While at Emory, Dr. Insel continued the line of research he had initiated at NIMH studying the neurobiology of complex social behaviors in animals. Early in his NIMH research career, which extended from 1979 to 1994, Dr. Insel conducted clinical research on obsessive-compulsive disorder (OCD), conducting some of the first treatment trials for OCD using the selective serotonin reuptake inhibitors (SSRI) class of medications. He has published over 200 scientific articles and 4 books, including the *Neurobiology of Parental Care* (with Michael Numan) in 2003.

Dr. Insel has served on numerous academic, scientific, and professional committees, including 10 editorial boards. He is a member of the Institute of Medicine, a fellow of the American College of Neuropsychopharmacology, and is a recipient of several awards [A. E. Bennett Award from the Society for Biological Psychiatry, Curt Richter Prize from the International Society of Psychoneuroendocrinology, Outstanding Service Award from the U.S. Public Health Service, and a Distinguished Investigator Award from the National Alliance for Research on Schizophrenia and Depression (NARSAD)]. Dr. Insel graduated from the combined B.A.-M.D. program at Boston University in 1974. He did his internship at Berkshire Medical Center, Pittsfield, MA, and his residency at the Langley Porter Neuropsychiatric Institute at the University of California, San Francisco.

NIMH DIRECTORS

Name	In Office from	To
Robert H. Felix	1949	1964
Stanley F. Yolles	1964	1970
Bertram S. Brown	1970	1977
Herbert Pardes	1977	1984
Shervert H. Frazier	1984	1986
Lewis L. Judd	1988	1992
Frederick K. Goodwin	1992	1994
Rex William Cowdry (Acting)	1994	1996
Steven E. Hyman	1996	2001
Richard K. Nakamura (Acting)	2001	2002
Thomas R. Insel	2002	Present

NIMH PROGRAMS

http://www.nimh.nih.gov/about/organization/index.shtml

Office of the Director

http://www.nimh.nih.gov/about/organization/od/index.shtml

Office on AIDS

This office coordinates all NIMH research and activities working toward a better understanding of the causes, diagnosis, treatment, and prevention of HIV/AIDS. The office also cooperates with voluntary and professional health organizations, other NIH components, and Federal agencies to identify national research needs and opportunities directed toward meeting AIDS-related public health goals.

Office of Constituency Relations and Public Liaison

This office oversees the NIMH's public liaison and outreach efforts, including requesting and receiving public input on the Institute's activities, as well as promoting and coordinating Institute interactions with patient advocacy, professional, scientific, and community-based organizations with specific interests in NIMH's mission and programs. The office also monitors mental health-related legislation and issues, and reviews all mental health-related reports to the Congress and other Federal agencies. On request, the office develops analyses and serves as a principal point of contact for interactions with NIH and Departmental staff, as well as with senior staff of the Office of the President and other Federal agencies.

Office for Research on Disparities and Global Mental Health (ORDGMH)

The NIMH Office for Research on Disparities and Global Mental Health (ORDGMH) coordinates the Institute's efforts to reduce mental health disparities both within and outside of the United States. The office's combined focus on local and global mental health disparities reflects an understanding of how the rapid movements of populations, global economic relationships, and communication technologies have created more permeable borders and new forms of interconnectedness among nations and people. These trends both require and enable researchers to address the variations in incidence, prevalence, and course of mental disorders and access to care across diverse populations using a global perspective.

ORDGMH oversees research on global mental health, health disparities, and women's mental health. The office works in close collaboration with NIMH's Office of Rural Mental Health Research to address the mental health needs of people living in rural areas.

Office of Resource Management

This office directs the Institute's resource allocation and management improvement processes by overseeing program planning and financial management, acquisition management, information resource management, management policy and procedure development, interpretation and implementation, the provision of general administrative services throughout the Institute, and personnel operations.

Office of Rural Mental Health

This office supports research activities and provides information on conditions unique to people living in rural areas, including research on the delivery of mental health services to such areas. Also, the office coordinates related Departmental research and activities with public and nonprofit entities.

Office of Science Policy, Planning, and Communications (OSPPC)

This office plans and directs a comprehensive strategic agenda for national mental health policy, including science program planning and related policy evaluation, research training and coordination, and technology and information transfer. In order to develop and assess NIMH strategic plan and portfolio management, OSPPC plans and implements portfolio analysis, scientific disease coding, and program evaluations. OSPPC also creates and implements the Institute's communication efforts, including information dissemination, media relations, and internal communications. The office proposes and guides science education activities concerned with informing the scientific community and public about diagnosis, treatment, and prevention of mental and brain disorders. In addition, the office is responsible for managing issues related to the Freedom of Information Act (FOIA), correspondence control, and clearance services for the Institute.

Division of Neuroscience and Basic Behavioral Science (DNBBS)

http://www.nimh.nih.gov/about/organization/dnbbs/index.shtml

The DNBBS supports research programs in the areas of basic neuroscience, genetics, basic behavioral science, research training, resource development, technology development, drug discovery, and research dissemination. In cooperation with other components of the Institute and the research community, the division has the responsibility of ensuring that relevant basic science knowledge is generated and then harvested improve diagnosis, treatment, and prevention of mental and behavioral disorders.

Office of Cross-Cutting Science and Scientific Technology

This office provides the programmatic lead on numerous scientific activities that cut across divisions, NIH institutes and centers, and agencies. These activities include, but are not limited to, the following: NIMH Small Business Research Program coordination; NIH Blueprint for Neuroscience Research; NIH BISTIC (Biomedical Information Science and Technology Initiative Consortium); NIH BECON (BioEngineering CONsortium); NIH Nano Task Force; and the United States-European Commission Task Force on Biotechnology. In addition, the office coordinates NIMH involvement in several NIH Roadmap initiatives (Interdisciplinary Research, Bioinformatics and Computational Biology, and Nanomedicine). The office also supports research and development of scientific technologies related to brain and behavioral research, including software (such as informatics tools and resources), hardware (such as devices and instrumentation), and wetware (such as novel genetic methods or bioactive and molecular imaging agents).

Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs

The SBIR Program supports research and development by small businesses of innovative technologies that have the potential to succeed commercially or provide significant societal benefit. The STTR program has the same objectives but requires academic research involvement. In the DNBBS, the SBIR and STTR programs support research and the development of tools related to basic brain and behavioral science, genetics, and drug discovery and development relevant to the mission of NIMH.

Office of Research Training and Career Development

This office supports research training at the pre-doctoral, postdoctoral, and early investigator level of career development in basic neuroscience, basic behavioral science, and other areas relevant to the focus of the DNBBS. The office's primary goal is to ensure that sufficient, highly trained research investigators will be available to address basic and clinical research questions pertinent to mental health and mental illness and thereby to reduce the burden of mental and behavioral disorders.

Genomics Research Branch

The Genomics Research Branch plans, supports, and administers programs of research including the identification, localization, and function of genes and other genomic elements that produce susceptibility to mental disorders. Research projects use genetic epidemiological methods, population-based sampling; longitudinal cohort and extended-family study designs; and genomic approaches to identify genetic, biological, and environmental risk factors and biomarkers for diagnosis, prognosis, drug efficacy, and pharmacogenomics of mental disorders. The branch also supports the creation and distribution of research resources, including the development of novel statistical and bioinformatics tools and the NIMH Human Genetics Initiative, a repository of DNA extracted from blood and immortalized cell lines and associated clinical information for use in genetic studies of mental disorders.

Molecular, Cellular, and Genomic Neuroscience Research Branch

This branch plans and administers research programs that elucidate the genetic, molecular, and cellular mechanisms underlying brain development, neuronal signaling, synaptic plasticity, circadian rhythmicity, and the influence of hormones and immune molecules on brain function. Other supported activities include drug discovery, identification of novel drug targets, development of functional imaging ligands, development of imaging probes as potential biomarkers, testing of models for assessing novel therapeutics, and studies of mechanisms of action of therapeutics in animals and humans.

Behavioral Science and Integrative Neuroscience Research Branch

This branch supports innovative research—including empirical, theoretical, and modeling approaches—on cognitive, affective, social, motivational, and regulatory systems and their development across the lifespan in humans, in nonhuman primates, and in other animals. Relevant reduced and model systems approaches are also supported. Basic research in these areas provides a foundation for new insights into the nature and origins of mental and behavioral disorders and for the development of improved treatment and prevention interventions.

Molecular Libraries and Imaging Roadmap Program

This program provides infrastructure support and coordination for the NIH Roadmap Molecular Libraries Screening Centers Network and for related technology development projects. The program supports research on biological assay implementation, high-throughput screening to identify active compounds, synthetic chemistry and probe development, and informatics.

Division of Adult Translational Research and Treatment Development (DATR)
http://www.nimh.nih.gov/about/organization/datr/index.shtml

The DATR supports programs aimed at understanding the pathophysiology of adult and late-life mental illness and hastening the translation of behavioral science and neuroscience advances into innovations in clinical care. The division supports a broad research portfolio, which includes studies of the phenotypic characterization and risk factors for major psychiatric disorders; clinical neuroscience to elucidate etiology and pathophysiology of these disorders; and psychosocial, psychopharmacologic, and somatic treatment development.

SBIR and STTR Programs

The SBIR program supports research and development by small businesses of innovative technologies that have the potential to succeed commercially or to provide significant societal benefits; the STTR program has the same objectives but requires academic research involvement. In the DATR, the SBIR and STTR programs support research aimed at facilitating the validation and commercialization of new methods of assessing psychopathology, measuring treatment response to therapeutic agents or approaches, and the clinical development of novel psychopharmacological or psychosocial approaches to the treatment of adult and late life mental illness.

Research Training and Career Development Program

This program supports research training at the pre-doctoral, post-doctoral, and early-investigator levels of career development in areas relevant to the DATR. These areas include adult psychopathology and psychosocial interventions, clinical neuroscience, geriatrics, translational research focusing on adults, and experimental therapeutics and treatment mechanisms related to mental illness. The program's primary goal is to ensure that sufficient numbers of highly trained, independent investigators will be available to address the complexities of adult psychopathology and translational research.

Traumatic Stress Research Program

This program is the DATR/NIMH point of contact for disaster/terrorism/biodefense-related research, supporting studies on biopsychosocial risk/protective factors for psychopathology after traumatic events and on interventions for post-traumatic stress disorder (PTSD) in adults. The program also oversees research spanning and

integrating basic science, clinical practice, and health care system factors, including interventions and service delivery, regarding the effects of mass trauma and violence (e.g., war, terrorism, and natural and technological disaster) on children, adolescents, and adults.

Adult Psychopathology and Psychosocial Intervention Research Branch

This branch promotes translational research that is directed toward an understanding of how the development, onset, and course of adult psychopathology may be studied in terms of dysfunction in fundamental biobehavioral mechanisms such as emotion, cognition, motivational processes, and interpersonal relationships. The branch emphasizes studies that combine approaches from neuroscience and behavioral science to elucidate the role of psychosocial factors in the alterations of brain functioning associated with mental disorders and to produce integrative models of risk, disorder, and recovery.

Clinical Neuroscience Research Branch

This branch supports research, training, and resource development programs aimed at understanding the neural basis of mental disorders. Specifically supported are human and animal studies on the molecular, cellular, and systems level of brain function designed to elucidate the pathophysiology of mental disease and to translate these findings to clinical diagnosis, treatment, and prevention strategies.

Geriatrics Research Branch

This branch supports research in the etiology and pathophysiology of mental disorders of late life (such as Alzheimer's disease and related dementias, neuroregulatory and hemostatic disorders, and menstrual cycle disorders), the treatment and recovery of persons with these disorders, and the prevention of these disorders and their consequences. The program encourages collaborative multidisciplinary research programs using the tools of molecular neuroscience, cognitive sciences, and social and behavioral sciences to facilitate the translation of basic science and preclinical research to clinical research.

Experimental Therapeutics Branch

This branch supports multidisciplinary research and resource development on novel pharmacological approaches to treat mental disorders, evaluation of existing treatments for new clinical uses, novel somatic treatments, and other areas related to treatment. The branch also engages in cross-Institute activities to identify specific bottlenecks in the development of novel treatments for mental disorders and collaborates with academic, industry, and regulatory agencies to develop programmatic approaches to hasten the availability of better treatments to reduce the burden of mental illness.

Division of Developmental Translational Research (DDTR)
http://www.nimh.nih.gov/about/organization/ddtr/index.shtml

The DDTR supports programs of research and research training with the ultimate goal of preventing and curing mental disorders that originate in childhood and adolescence. Relevant disorders include mood disorders, anxiety, schizophrenia, autism, attention deficit hyperactivity disorder, conduct disorder, eating disorders, obsessive compulsive disorder, and Tourette syndrome. The division stimulates and promotes an integrated program of research across basic behavioral/psychological processes, environmental processes, brain development, genetics, developmental psychopathology, and therapeutic interventions.

SBIR and STTR Programs

The SBIR program supports research and development by small businesses of innovative technologies that have the potential to succeed commercially or to provide significant societal benefits; the STTR program has the same objectives but requires academic research involvement. In the DDTR, the SBIR and STTR programs support research aimed at the development and validation of new methods and techniques to advance understanding, prevention, and treatment of child psychopathology.

Research Training and Career Development Program

This program supports research training at the pre-doctoral, post-doctoral, and early investigator level of career development in areas relevant to the DDTR. The program's primary goal is to ensure that sufficient numbers of highly trained, independent investigators will be available to address the complexities of developmental psychopathology that inform the trajectories and mechanisms of mental disorders.

Developmental Trajectories of Mental Disorders Branch

This branch supports research that identifies trajectories of mental disorders by looking across time (e.g., across developmental stages) at sequential and integrative relationships among genetic, neural, behavioral, and experiential/environmental factors leading to psychopathology or to recovery. Emphasis is on developmental progressions and the identification of early signs, risk factors, predictors, and biological mediators/moderators of continuity or change. The branch also supports prevention and treatment trials and testing of personalized interventions. The branch strongly encourages cross-disciplinary research collaborations. Studies of humans and non-human animals are supported.

Neurobehavioral Mechanisms of Mental Disorders Branch

This branch supports research that identifies mechanisms responsible for mental disorders by looking across levels of analysis to specify genetic, neural, behavioral, and environmental components that interact to define etiology of childhood-onset mental disorders. Cognitive, emotional, sensorimotor, and biobehavioral processes that are often shared across disorders, and the neurobiological mechanisms underlying them, are of particular interest to this branch. Also of interest is research leading to the identification of biomarkers and novel pharmacologic agents, as well as the development of novel mechanism-based cognitive or behavioral interventions for childhood-onset mental disorders. This branch encourages cross-disciplinary research collaborations. Studies involving human and non-human animals are supported.

Division of AIDS Health and Behavior Research (DAHBR)
http://www.nimh.nih.gov/about/organization/dahbr/index.shtml

The DAHBR supports research programs that focus on developing and disseminating behavioral interventions that prevent HIV/AIDS transmission, clarifying the pathophysiology and alleviating the neuropsychiatric consequences of HIV/AIDS infection, and using a public health model to reduce the burden of mental illness from medical co-morbidities, non-adherence to treatment, societal stigma, health disparities, and unhealthy behaviors.

SBIR and STTR Programs

The SBIR program supports research and development by small businesses of innovative technologies that have the potential to succeed commercially or to provide significant societal benefits. The STTR program has the same objectives but requires academic research involvement. In the DAHBR, the SBIR and STTR programs support research aimed at changing risky behaviors, promoting strategies to reduce AIDS transmission, elucidating the pathophysiology of HIV-related neuropsychiatric dysfunction, and investigating processes that influence adherence to treatment in individuals with HIV.

Research Training and Career Development Program

This program supports research training at the pre-doctoral, post-doctoral, and early-investigator level of career development in areas relevant to the DAHBR, such as research on treatment adherence and behavior change in patients with mental disorders. The program's primary goal is to ensure that sufficient numbers of highly trained independent investigators will be available to address the complexities of health behaviors involved in mental illness.

Center for Mental Health Research on AIDS

This center supports domestic and international studies to develop behavior change and prevention strategies to reduce the transmission of HIV and other sexually transmitted diseases. To accomplish this goal, the center oversees research in developing and testing interventions to reduce the neuropsychiatric morbidity associated with HIV infection, clarifying the pathophysiology of HIV infection of the central nervous system (CNS) and associated motor/cognitive disturbances, developing therapeutic agents to prevent or reverse the effects of HIV on the CNS, improving the effectiveness and efficiency of mental health services relevant to HIV infection and people living with HIV and co-occurring mental illness, and other related areas.

Health and Behavioral Research Branch

This branch supports research on a range of health behaviors in people with mental disorders, such as identifying potent, modifiable risk and protective factors for mental disorders that may guide the development and initial testing of theory-driven interventions. Interventions may comprise prevention, treatment, or rehabilitation and include biological, pharmacological, behavioral, psychosocial, or environmental components. Examples of supported research areas include adherence to interventions for mental disorders, ethics in mental disorders research, and functional assessment in people with mental disorders.

Division of Services and Intervention Research (DSIR)
http://www.nimh.nih.gov/about/organization/dsir/index.shtml

The DSIR supports 2 critical areas of research: intervention research to evaluate the effectiveness of pharmacologic, psychosocial (psychotherapeutic and behavioral), somatic, rehabilitative, and combination interventions on mental and behavior disorders; and mental health services research on organization, delivery (process and receipt of care), related health economics, delivery settings, clinical epidemiology, and the dissemination and implementation of evidence-based interventions into service settings. The division also provides biostatistical analysis and clinical trials operations expertise for research studies; analyzes and evaluates national mental health needs and community research partnership opportunities; and supports research on health disparities.

SBIR and STTR Programs

The SBIR program supports research and development by small businesses of innovative technologies that have the potential to succeed commercially or to provide significant societal benefits. The STTR program has the same objectives but requires academic research involvement. In the DSIR, the SBIR and STTR programs support research and development of tools related to clinical trials (including preventive, treatment, and rehabilitative interventions alone or in combination), clinical epidemiology, services research, effectiveness research, health disparities (including rural populations), and the dissemination of evidence-based treatments and research into services and clinical practice in areas directly related to the mission of NIMH.

Office of Research Training and Career Development

This office supports research training at the pre-doctoral, post-doctoral, and early-investigator levels of career development in areas relevant to the DSIR. Areas of emphasis include research related to clinical trials (including preventive, treatment, and rehabilitative interventions alone or in combination) and adapting interventions and demonstrating their utility in broad populations (e.g., ethnic and racial groups, co-morbid disorders) for various service settings (e.g., primary care, schools, public sector). The office's primary goal is to ensure that sufficient, highly trained research investigators will be available to address interventions and services research questions pertinent to mental health and mental illness and thereby to reduce the burden of mental and behavioral disorders.

Clinical Trials Operations and Biostatistics Unit

This unit serves as the operations focal point for collaborative clinical trials on mental disorders in adults and children. The unit is responsible for overseeing both contract-supported and cooperative agreement-supported multisite clinical trial protocols, as well as special projects undertaken by NIMH. In addition, the unit manages over-arching matters related to clinical trials operations, such as the coordination of the ancillary protocols across the large trials and the implementation of NIMH policy for dissemination of public access datasets. The unit also consults Institute staff and grantees/contractors on biostatistical matters related to appropriateness of study design, determination of power and sample size, and approaches to statistical analysis of data from NIMH-supported clinical trials.

Adult Treatment and Preventive Intervention Research Branch

This branch supports research evaluating therapeutic (acute, maintenance, and preventive) and adverse effects of psychosocial, psychopharmacologic, and somatic interventions of proven efficacy in the treatment of mental disorders in adult populations. For example, the branch has administered trials evaluating modified or adapted forms of interventions for use with special populations (such as women, or specific ethnic or racial groups), in new settings (public sector, primary care, workplace, other non-academic sites), through new methods of treatment delivery (e.g., web or computer-based). Studies look beyond symptom reduction to include short- and long-term assessment of functioning and other outcome measures that can help identify disorder subgroups more likely to benefit from treatment, to determine the optimal length of treatment, and to evaluate the long-term impact of interventions.

Child and Adolescent Treatment and Preventive Intervention Research Branch

This branch plans, supports, and administers research programs to evaluate the effectiveness of mental health preventive, treatment, and rehabilitative interventions (alone or in combination) for children and adolescents. The branch also supports research addressing the long-term effectiveness of known successful interventions, including their role in preventing relapse and recurrence of mental disorders. Types of intervention research supported by the branch include the full range of behavioral, psychotherapeutic, pharmacologic, and non-pharmacologic somatic or complementary/alternative approaches for which acute efficacy has been demonstrated, as well as rehabilitation or other adjunctive interventions.

Services Research and Clinical Epidemiology Branch

This branch administers programs of research, training, and infrastructure development, across the lifespan, on all mental health services research issues, including but not limited to: services organization, delivery (process and receipt of care), and related health economics at the individual, clinical, program, community, and systems levels in specialty mental health, general health, and other delivery settings (such as the workplace); interventions to improve the quality and outcomes of care, including diagnostic, treatment, preventive, and rehabilitation services; enhanced capacity for conducting services research; clinical epidemiology of mental disorders across all clinical and service settings; and dissemination and implementation of evidence-based interventions into service settings.

Division of Extramural Activities (DEA)
http://www.nimh.nih.gov/about/organization/dea/index.shtml

The DEA provides leadership and advice in developing, implementing, and coordinating extramural programs and policies; represents the Institute on extramural program and policy issues within HHS and with outside organizations; provides scientific and technical peer and objective review of applications for grants, cooperative agreements, and contracts; provides information and guidelines for grant applications; oversees National Advisory Mental Health Council activities and provides committee management services.

Division of Intramural Research Programs (DIRP)
http://intramural.nimh.nih.gov/

The DIRP is the internal research division of the NIMH. Intramural scientists conduct research ranging from studies into mechanisms of normal brain function —conducted at the behavioral, systems, cellular, and molecular levels—to clinical investigations into the diagnosis, treatment, and prevention of mental illness. Major disease entities studied throughout the lifespan include mood disorders and anxiety, schizophrenia, obsessive-compulsive disorder, attention deficit hyperactivity disorder, and pediatric autoimmune neuropsychiatric disorders. Because of its outstanding resources, unique funding mechanisms, and location in the nation's capital, the DIRP is viewed as a national resource, providing unique opportunities in mental health research and research training.

This page last reviewed on August 6, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Recent Photos from the National Institute of Mental Health (NIMH)

2009 PHOTOS

Cover of the NIMH Strategic Plan. Implementation of the Strategic Plan's four major objectives began in 2008.
lo-res

In October 2008, NIMH and the U.S. Army entered into a $50 million memorandum of agreement to study suicide and suicidal behavior among soldiers. Signing the agreement are (L-R seated at table) U.S. Army Chief of Staff General George W. Casey, Jr., Army Secretary Pete Geren, and NIMH Director Dr. Thomas R. Insel.

lo-res | hi-res

This page last reviewed on February 24, 2011

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U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

National Institute on Minority Health and Health Disparities

NIMHD

Mission | Important Events | Legislative Chronology | Director | Programs

MISSION

The National Institute on Minority Health and Health Disparities (NIMHD) leads scientific research to improve minority health and eliminate health disparities. To achieve its mission, the NIMHD:

- Plans, reviews, coordinates, and evaluates all minority health and health disparities research and activities of the NIH;
- Conducts and supports research on health disparities;
- Promotes and supports the training of a diverse research workforce;
- Translates and disseminates research information; and
- Fosters innovative collaborations and partnerships.

Vision

The NIMHD envisions an America in which all populations will have an equal opportunity to live long, healthy and productive lives.

IMPORTANT EVENTS IN NIMHD HISTORY

1990—The Office of Minority Programs (OMP) was established in the NIH Office of the Director, at the request of then Secretary of the U.S. Department of Health and Human Services, Dr. Louis Sullivan. Dr. John Ruffin was appointed Associate Director of Minority Programs to direct the OMP.

1991—The OMP convened an advisory Fact-Finding Team (FFT) to conduct three regional conferences with grassroots constituencies. The FFT issued a report with 13 recommendations from the community that guided the initial efforts of the OMP.

1992—The Minority Health Initiative (MHI), the centerpiece of the OMP agenda, was launched in response to the FFT's recommendations, and initially funded at $45 million. This multi-year biomedical and behavioral research and research training program is a partnership with the NIH Institutes and Centers. The OMP co-funded various projects including: 1) interventions to improve prenatal health and reduce infant mortality; 2) studies of childhood and adolescent lead poisoning; 3) HIV infection and AIDS; 4) alcohol and drug use studies; 5) research in adult populations focused on cancer, diabetes, obesity, hypertension, cardiovascular diseases, mental disorders, asthma, visual impairments, and alcohol abuse; and 6) training for faculty and for students at all stages of the educational pipeline —from precollege and undergraduate through graduate and postdoctoral levels.

1992—The OMP initiated a study with the National Academy of Sciences designed to present an overview of NIH extramural research training programs for minority students and to assess the feasibility of conducting a trans-NIH assessment of these programs.

1993—Public Law 103-43, the Health Revitalization Act of 1993, established the Office of Research on Minority Health (ORMH) in the Office of the Director, NIH. Dr. John Ruffin was appointed as the Associate Director for Research on Minority Health.

1994—The National Conference on Minority Health Research and Research Training was held in Chicago.

1996—Conferences were held in Honolulu, Hawaii; Miami, Florida; and Puerto Rico to inform ORMH constituencies of the progress made, to solicit feedback on those achievements, and to obtain information on the needs of minority populations.

1997—The Advisory Committee on Research on Minority Health was established to provide advice to the Director, ORMH, and to the Director, NIH, regarding research and research training with respect to minority health issues.

1998—The first meeting of the Advisory Committee on Minority Health was held.

2000—The ORMH celebrated its 10th anniversary with a conference entitled *Closing the Minority Health Gap: 10 Years of Progress and Challenge in Eliminating Health Disparities*.

2000—The National Center on Minority Health and Health Disparities (NCMHD) was established by the passage of the Minority Health and Health Disparities Research and Education Act of 2000, Public Law 106-525, which was signed by the President of the United States, William Jefferson Clinton, on November 22, 2000. The bill was introduced into the Congress by Senator Edward Kennedy of Massachusetts.

2001—Dr. John Ruffin was sworn in as the first director of the National Center on Minority Health and Health Disparities.

2001—Programs mandated by Congress were implemented to expand the infrastructure of Institutions committed to health disparities research and to encourage the recruitment and retention of highly qualified minority and other scientists in the fields of biomedical, clinical, behavioral, and health services research: 1) the Endowment Program, 2) the Loan Repayment Program for Health Disparities Research, and 3) the Extramural Clinical Research Loan Repayment Program for Individuals from Disadvantaged Backgrounds.

2002—The Congressionally mandated program, *Centers of Excellence program* was launched, referred to as Project EXPORT—Partnerships for Community Outreach, Research on Health Disparities and Training.

2002—The first meeting of the National Advisory Council on Minority Health and Health Disparities (NACMHD) was convened.

2002—The NCMHD assumed responsibility for the Research Infrastructure in Minority Institutions Program (RIMI), which was established by its predecessor ORMH, in partnership with the National Center for Research Resources.

2003—The first *NIH Strategic Research Plan and Budget to Reduce and Ultimately Eliminate Health Disparities* was issued.

2005—The NCMHD assumed responsibility for the Minority International Research Training Program (MIRT) which was established by its predecessor ORMH in partnership with Fogarty International Center (FIC). The program was renamed to be more consistent with the mission of the NCMHD to the Minority Health and Health Disparities International Research Training Program (MHIRT).

2005—The NCMHD Community Based Participatory Research (CBPR) program was established. This program supports community-based participatory research intervention studies to reduce health disparities caused by diseases or conditions affecting minority and other health disparity communities.

2005—The National Research Council of the National Academies released the report *Assessment of NIH Minority Research and Training Programs: Phase 3*. The report was the culmination of a series of assessments and analyses of the NIH minority research and training programs initiated by the ORMH, the predecessor to the NCMHD. This report examined the effectiveness of the programs and provided recommendations for improvement.

2006—The Institute of Medicine of the National Academies issued the report *Examining the Health Disparities Research Plan of the National Institutes of Health: Unfinished Business*. The NCMHD requested this report to assess the adequacy of the NIH Health Disparities Strategic Plan in achieving the goals and objectives, to evaluate the adequacy of coordination among the NIH Institutes and Centers in developing the strategic plan, and to obtain recommendations to help NIH achieve the objectives of the strategic plan.

2007—The NCMHD Centers of Excellence in Partnerships for Community Outreach, Research on Health Disparities and Training (Project EXPORT), was re-competed for the first time. The program was also renamed the NCMHD Centers of Excellence program.

2008—NCMHD hosted the first NIH Science of Eliminating Health Disparities Summit on December 16-18, 2008. The summit attracted more than 4,000 participants including scientists, health care practitioners, policy makers, community leaders, and students who work or have an interest in eliminating health disparities. Acclaimed poet Maya Angelou spoke at the opening ceremony.

2008—NIH Director Dr. Elias Zerhouni approved an Intramural Research Program (IRP) for the NCMHD. Acting NIH Director Dr. Raynard Kington announced the creation of the NCMHD IRP at the NIH Science of Eliminating Health Disparities Summit.

2009—NCMHD launched its Health Disparities Research on Minority and Underserved Populations program. This Research Project Grant (R01) funds original and innovative research addressing elements that support the advancement of research to eliminate health disparities.

2009—NCMHD launched the NIH Health Disparities Seminar Series in July 2009. The monthly lecture series brings national and international health disparities experts including NIH and federal agency partners to the NIH to share information about advances, gaps, and current issues related to health disparities research.

2009—The NCMHD Disparities Research and Education Advancing our Mission (DREAM) program was launched as a component of the NCMHD Intramural Research Program.

2009—The Research Infrastructure in Minority Institutions Program (RIMI) was renamed the Building Research Infrastructure and Capacity (BRIC) program to be more consistent with the mission of NCMHD.

2009—NCMHD partnered with the NIH Office of Intramural Research to sponsor the 2009 NIH J. Edward Rall Cultural Lecture as part of the NIH Wednesday Afternoon Lecture Series, featuring Dr. Maya Angelou.

2009—NCMHD, in partnership with the HHS Office of Minority Health and the U.S. Department of Education formalized the Federal Collaboration on Health Disparities Research (FCHDR) comprised of 14 federal executive departments. FCHDR promotes enhanced coordination of efforts to improve the health of health disparity populations. NCMHD co-leads FCHDR.

2010—NCMHD was re-designated to the National Institute on Minority Health and Health Disparities (NIMHD) with the passing of the Patient Protection and Affordable Care Act. In addition, the Research Endowment program was expanded to include NIMHD Centers of Excellence as eligible institutions.

2010—NIMHD launched a two-week intensive Translational Health Disparities Course: Integrating Principles of Science, Practice, and Policy in Health Disparities Research.

2010—NIMHD launched a Faith-based Initiative on Health Disparities and a Social Determinants of Health Initiative.

2011—NIMHD established the Scientific Education Initiative, which supports educational, mentoring, and career development programs for individuals from health disparity populations that are underrepresented in the research sciences.

2011—NIMHD launched the Resource-Related Minority Health and Health Disparities Research Initiative to support minority health and health disparities research activities using a cooperative agreement which requires substantial federal scientific or programmatic involvement.

2011—NIMHD appointed William G. Coleman, Jr., Ph.D., as the NIMHD's first permanent scientific director and the first African-American scientific director in the history of the NIH Intramural Research Program.

2011—NIMHD assumed responsibility for the Research Centers in Minority Institutions (RCMI) program formerly administered by the National Center for Research Resource's (NCRR).

2012—NIMHD organized the first-ever “NIH Minority Health Promotion Day” on April 19, 2012 in honor of National Minority Health Month working with the other NIH ICs and other federal agencies.

2012—NIMHD established its Transdisciplinary Collaborative Centers for Health Disparities Research Program to support transdisciplinary coalitions of academic institutions, community organizations, service providers and systems, government agencies, and other stakeholders focused on select topics related to health disparities.

2012—NIMHD hosted the 2012 Science of Eliminating Health Disparities Summit from December 17-19, 2012, a partnership with the NIH Institutes and Centers, the HHS agencies, and 14 of the 15 federal executive departments. Rescheduled due to Hurricane Sandy in October 2012, the summit attracted thousands of participants. Major highlights included a portrait unveiling for former Congressman Louis Stokes and dedication of the Summit to the late Senator Arlen Specter.

NIMHD LEGISLATIVE HISTORY

1993—P.L. 103-43, the Health Revitalization Act of 1993, established the Office of Research on Minority Health in the Office of the Director of the National Institutes of Health.

2000—P.L. 106-525, Minority Health and Health Disparities Research and Education Act of 2000, established the National Center on Minority Health and Health Disparities. It also called for the development of a NIH comprehensive strategic research plan and budget for health disparities research. It authorizes the NCMHD Director and the Director of the Agency for Health care Research Quality (AHRQ) to define health disparity populations. The law also requires the NCMHD to maintain communications with all Public Health Service agencies and other Departments of the Federal government to disseminate health disparities research information.

2010—On March 23, 2010, the Patient Protection and Affordable Care Act (P.L. 111-148) passed and re-designated the NCMHD to an Institute, the National Institute on Minority Health and Health Disparities (NIMHD). The law gave the NIMHD authority to plan, review, coordinate, and evaluate the minority health and health disparities research and activities conducted and supported by the NIH Institutes and Centers. In addition, it transferred all of the responsibilities of the NCMHD to the NIMHD and expanded the eligibility criteria for the Research Endowment program to include institutions with an active NIMHD Center of Excellence grant.

BIOGRAPHICAL SKETCH
JOHN RUFFIN, PH.D., NIMHD DIRECTOR

Dr. John Ruffin is the Director of the National Institute on Minority Health and Health Disparities (NIMHD). He oversees the NIMHD budget of approximately $276 million. In addition, he provides leadership for the minority health and health disparities research activities of the National Institutes of Health (NIH) which constitutes an annual budget of approximately $2.8 billion.

He is a well-respected leader and visionary in the field of minority health and health disparities. As an academician and a scientist, he has devoted his professional career to improving the health status of racial and ethnic minorities and other medically underserved populations in the United States. He has an impressive track record of developing and supporting programs to increase the cadre of minority scientists, physicians, and other health professionals, as well as attract a diverse group of researchers to the health disparities field.

His success has been due in large part to his ability to motivate others and gain the support of key individuals and organizations, as well as to his expertise in strategic planning, administration, and the development of numerous collaborative partnerships. For the past 20 years, he has led the transformation of the NIH minority health and health disparities research agenda from a programmatic concept to an institutional reality. Under his leadership the NIH Office of Minority Programs was established to address the health of minorities around the country. That Office later transitioned to the Office of Research on Minority Health, which later became the National Center on Minority Health and Health Disparities in 2000, and in March 2010 the Patient Protection and Affordable Care Act re-designated it the National Institute on Minority Health and Health Disparities.

As the NIH federal official for minority health disparities research, through multi-faceted collaborations, Dr. Ruffin has planned and brought to fruition the largest biomedical research program in the nation to promote minority health and other health disparities research and training. In his quest to eliminate health disparities,

the hallmark of his approach is to foster and expand strategic partnerships in alliance with the NIH Institutes and Centers, various Federal and state agencies, community organizations, academic institutions, private sector leaders, international governments, and non-governmental organizations.

Under his leadership, the NIH convened its first summit on health disparities, "The NIH Science of Eliminating Health Disparities Summit" in December 2008. The summit showcased the work, progress, and challenges of the NIH Institutes and Centers and many of their federal and non-federal government partners involved in minority health and health disparities research around the theme of Integrating Science, Practice, and Policy. The summit attracted more than 4,000 individuals from around the world representing various disciplines and sectors. Four years later, the 2012 Science of Eliminating Health Disparities Summit was organized on a much larger scale, involving participation from 14 of the 15 federal executive departments including NIH and all of the HHS. This expansion of the summit was a direct result of Dr. Ruffin's vision to increase cross-sector involvement in the fight to eliminate health disparities.

Dr. Ruffin is committed to conceptualizing, developing, and implementing innovative programs that create new learning opportunities and exposure for individuals, communities, and academic institutions interested in eliminating health disparities. His efforts have impacted local, regional, national, and international communities. He has established and continues to expand a growing portfolio of research, training, and capacity building programs to train health professionals and scientists from health disparity populations, conduct cutting-edge health disparities research, and build the capacity at academic institutions and within the community to support a promising health disparities research enterprise.

His life-long commitment to academic excellence, improving minority health, promoting training and health disparities research has earned him distinguished national awards. Dr. Ruffin has received several honorary doctor of science degrees from institutions such as Spelman College, Tuskegee University, the University of Massachusetts in Boston, North Carolina State University, Morehouse School of Medicine, Meharry Medical College, Tulane University, Dillard University, and Medgar Evers College. He has been recognized by various professional, non-profit, and advocacy organizations including: the National Medical Association, the Society for the Advancement of Chicanos and Native Americans in Science, the Association of American Indian Physicians, the Hispanic Association of Colleges and Universities, the Society of Black Academic Surgeons, and the National Science Foundation. The John Ruffin Scholarship Program is an honor symbolic of his legacy for academic excellence bestowed by the Duke University Talent Identification Program. He has also received the Martin Luther King, Jr. Legacy Award for National Service; the Cura Personalis Award from Georgetown University Medical Center; the Samuel L. Kountz Award for his significant contribution to increasing minority access to organ and tissue transplantation; the NIH Director's Award; the National Hispanic Leadership Award; Beta Beta Beta Biological Honor Society Award; the Department of Health and Human Services' Special Recognition Award; and the U.S. Presidential Merit Award.

Dr. Ruffin received a B.S. in Biology from Dillard University, an M.S. in Biology from Atlanta University, a Ph.D. in Systematic and Developmental Biology from Kansas State University, and completed post-doctoral studies in biology at Harvard University.

PROGRAMS

Four official organizational components comprise NIMHD:

The Office of the Director (OD)

The Office of the Director (OD) determines and provides leadership to the Institute's programs, plans, and policies. It provides leadership for the NIH minority health and health disparities research and activities including the implementation of the Minority Health and Health Disparities Research and Education Act (P.L. 106-525) and the Patient Protection and Affordable Care Act (P.L. 111-148) and other relevant public laws as they relate to the NIMHD mission. The NIMHD OD directs an integrated system of coordination for the NIH health disparities research program and the Institute's development and coordination of minority health and health disparities research programs, activities, and strategic partnerships with the NIH Institutes and Centers; NIH Office of the Director; Federal agencies; state, local, tribal, and regional public health agencies; and private entities. The NIMHD OD's four organizational components include the Office of Administrative Management, the Office of Communications and Public Liaison, the Office of Extramural Research Administration, and the Office of Strategic Planning, Legislation, and Science Policy. The NIMHD OD provides leadership for the NIH health disparities strategic plan and budget and leads the management, communications, legislation, strategic planning, science policy, and ethics activities for the Institute. It also provides leadership for developing and revising the national definition for health disparity population in consultation with the Agency for Healthcare Research and Quality.

Division of Scientific Programs (DSP)

The Division of Scientific Programs (DSP) serves as the focal point for planning, directing, implementing, and managing the Institute's extramural research programs, including its legislatively mandated extramural research programs and other research, research training, research capacity building, career development, and community-based participatory research initiatives. The organizational components of this division include the Office of Research Training and Capacity Building and the Office of Research Innovation and Program Coordination. DSP manages a diverse portfolio of special projects with respect to minority health conditions and other populations with health disparities, determines program priorities, and recommends funding strategies to achieve program goals.

Division of Data Management and Scientific Reporting (DDMSR)

The Division of Data Management and Scientific Reporting (DDMSR) provides leadership for knowledge management and scientific reporting. It maintains a Health Disparities Information (HDI) database to facilitate the collection, interpretation, and analysis of data, education, dissemination, and communication of information to various audiences in collaboration with other organizational components of the Institute. This division collaborates with the Office of Strategic Planning, Legislation, and Science Policy to analyze and synthesize data on minority health and health disparities research conducted and supported by the Institutes and Centers. It also coordinates reporting requests on the Institute and NIH activities on minority health and health disparities research; provides epidemiological and statistical expertise for the Institute on planning, designing, and implementing research studies and to support research programs; coordinates data collection activities and reporting on minority health and health disparities including the Institute's implementation of relevant policies, regulations, and laws; and provides advice to the Institute senior management and program officials on data collection standards and guidelines. The DDMSR coordinates Institute activities under the Privacy Act and administers the Institute's Freedom of Information Act activities.

Division of Intramural Research (DIR)

This Division of Intramural Research (DIR) provides leadership for the Institute's intramural research program to prevent, diagnose, treat, and understand disease and conditions that disproportionately affect health disparity populations. It plans, develops, and conducts innovative trans-disciplinary research focusing on the linkage between biological and non-biological determinants of health in health disparity populations to include basic, behavioral, social sciences, and clinical research. This division develops, coordinates, and implements training and career development programs in minority health and health disparities research. It collaborates with and coordinates intramural research on minority health and health disparities conducted by the Institutes and Centers, integrates new research into the Institute's program structure, and provides advice to the Institute Director and staff on matters of scientific interest to the Institute.

NIMHD Leading Programs:

The Centers of Excellence Program (COE) is congressionally mandated by Public Law 106-525. The program was established to develop novel programs in the U.S. that would make significant advances and contributions to easing the health burden in underserved populations and in reducing and ultimately eliminating health disparities in several priority diseases and conditions. This strategy helps to increase the pool of investigators from health disparity populations through research training and faculty development. In addition, the collaborations help disseminate health information to underserved populations and increase the participation of health disparity populations in clinical trials. The program has funded studies on numerous diseases/conditions including breast, prostate, and pancreatic cancers; human papillomavirus; HIV; and cardiovascular disease.

The Research Endowment Program is congressionally mandated by Public Law 106-525. The program was established to provide endowments to eligible academic institutions to support minority health and health disparities research. The educational institutions must use interest from the grants to a) build the capacity for research or research training which may include renovating facilities, improving technology, or updating equipment; b) recruit and develop a diverse faculty, as well as create courses concerning health disparities research methodology; and c) advance recruitment and training of students from underrepresented and socio-economically disadvantaged populations who plan to pursue scientific careers.

The Loan Repayment Program (LRP)
NIMHD offers two types of loan repayment programs. The Health Disparities Research Loan Repayment Program is mandated by the Congress to increase the pool of extramural researchers who conduct health disparities research. The Extramural Clinical Research Loan Repayment Program extends to health professionals from disadvantaged backgrounds who engage in clinical research. Eligible candidates are health professionals with postdoctoral degrees who are not federally employed and interested in conducting basic, clinical, behavioral, social sciences, or health services research addressing health disparities.

The Community Based Participatory Research Program (CBPR) is designed to promote collaborative research between scientific researchers and members of the community through the joint design and implementation of intervention research projects targeting health disparities in underserved populations including racial and ethnic minorities, rural populations, and individuals of low socio-economic status.

The ultimate goal is to foster sustainable efforts at the community level that will accelerate the translation of research advances to health disparity populations and eliminate health disparities. The CBPR Initiative has three phases. It starts with a three year planning grant, followed by a competitive five year intervention grant and concludes with a competitive three year information dissemination grant. This is a long term commitment by the NIMHD with potential funding for up to 11 years in individual CBPR projects.

The Minority Health and Health Disparities International Research Training Program (MHIRT) supports young scientists conducting scientific research abroad. It offers short-term international training opportunities in health disparities research for undergraduate and graduate students in the health professions who are from health disparity populations. Grantees work with international health investigators in countries around the world including Mexico, Uganda, Ghana, Australia, Peru, Spain, and South Africa.

The Building Research Infrastructure and Capacity Program (BRIC) supports the development of sustainable research programs at non-research intensive institutions of higher education. The primary goal is to build, strengthen, and/or enhance the research infrastructure and research training capacity of non-research intensive institutions.

The Small Business Innovation Research/Small Business Technology Transfer Program (SBIR/STTR) is a highly competitive federal program mandated by the Congress as a part of the Small Business Development Act. Each year designated federal departments and agencies award a reserved portion of their research and development funds to small businesses and to partnerships between small businesses and nonprofit research institutions to bring innovative technologies to market. The NIMHD SBIR/STTR Programs give high priority to research activities designed to empower health disparity communities to achieve health equity through health education, disease prevention, and community-based, problem driven research.

The Health Disparities Research on Minority and Underserved Populations Program, a NIH Research Project Grant (R01) program, supports original and innovative research addressing elements that eliminate health disparities. It also supports the study of diseases/conditions that contribute to poor health outcomes or disproportionately impact racial and ethnic minority populations, rural and urban poor, and other health disparity populations.

The Disparities Research and Education Advancing Mission Career Transition Award (DREAM) is the NIMHD's first intramural program. It facilitates the transition of early stage investigators involved in health disparities research from the mentored stage of career development to become independent investigators. DREAM grants provide an opportunity for investigators to develop solid research skills during the initial period of up to two years of study and research within the NIH Intramural Research Programs located on the NIH campus.'; The award may also include a follow-on period of up to three years of salary and mentored research support at the candidate's current institution or organization or an academic or research grantee institution of the candidate's choice. This period of extramural support will facilitate the transition to independence as a researcher in health disparities research.

The Science Education Initiative supports educational, mentoring, and career development programs for individuals from health disparity populations that are underrepresented in the research sciences. The program is geared towards ensuring that minority and health disparity populations are continuously exposed to and

encouraged to explore careers in biomedical, behavioral, clinical, and social sciences ranging from kindergarten through early-stage investigators.

The Resource-Related Minority Health and Health Disparities Research Initiative supports minority health and health disparities research activities using a cooperative agreement which requires substantial federal scientific or programmatic involvement. The initiative focuses on bioethics research, global health, data infrastructure, information dissemination, and research on healthcare for rural populations.

The Research Centers in Minority Institutions Program (RCMI) enhances the research capacity and infrastructure at minority institutions that offer doctorates in the health professions or health sciences by expanding human and physical resources for conducting basic, clinical, and translational research.

The Transdisciplinary Collaborative Centers for Health Disparities Research Program establishes specialized centers that support transdisciplinary coalitions focused on priority areas in minority health and health disparities research, such as health policy and the social determinants of health. Coalitions bring together academic institutions, community organizations, service providers and systems, government agencies, and other stakeholders. The program supports targeted research, implementation, and dissemination activities that transcend customary approaches and "silo" organizational structures to address critical questions at multiple levels.

This page last reviewed on March 5, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

National Institute of Neurological Disorders and Stroke

Mission | Important Events | Legislative Chronology | Director | Divisions

Originally National Institute of Neurological Diseases and Blindness. Name changed 1968 to National Institute of Neurological Diseases and Stroke; March 1975 to National Institute of Neurological and Communicative Disorders and Stroke; and October 1988 to present name.

MISSION

Created by the U.S. Congress in 1950, the National Institute of Neurological Disorders and Stroke (NINDS) has occupied a central position in the world of neuroscience for nearly 60 years.

The mission of NINDS is to reduce the burden of neurological disease—a burden borne by every age group, every segment of society, and people all over the world.

To accomplish this goal, the Institute supports and conducts basic, translational, and clinical research on the healthy and diseased nervous system; fosters the training of investigators in the basic and clinical neurosciences; and seeks better understanding, diagnosis, treatment, and prevention of neurological disorders.

The Institute's extramural program supports thousands of research project grants at institutions across the country. Institutional training grants and individual fellowships support hundreds of scientists in training and provide career awards that offer a range of research experience and support for faculty members at various levels. Scientists in the Institute's laboratories and clinics in Bethesda, Maryland, conduct research in the major areas of neuroscience and on many of the most important and challenging neurological disorders. NINDS staff researchers also collaborate with scientists in several other NIH Institutes.

This is a time of accelerating progress and increasing hope in the battle against brain disease. Advances in understanding the nervous system are beginning to pay off in the form of treatments for previously intractable problems such as spinal cord injury, acute stroke, multiple sclerosis, epilepsy, and Parkinson's disease, to name a few.

The NINDS vision is:

- To lead the neuroscience community in shaping the future of research and its relationship to brain diseases.
- To build an intramural program that is the model for modern collaborative neuroscience research.
- To develop the next generation of basic and clinical neuroscientists through inspiration and resource support.
- To seize opportunities to focus our resources to rapidly translate scientific discoveries into prevention, treatment, and cures.
- To be the first place the public turns to for authoritative neuroscience research information.

IMPORTANT EVENTS IN NINDS HISTORY

1950—On August 15 President Harry S. Truman signed Public Law 81-692, establishing the National Institute of Neurological Diseases and Blindness (NINDB).

1951—NINDB received its first budget of $1,232,253.

1953—The NINDB budget became a line item in the NIH budget.

1953-54—An intramural program of clinical investigation was initiated, including medical neurology, surgical neurology, and electroencephalography. Training programs in neurology and ophthalmology were initiated.

1955—Basic science training grants were initiated.

1956—The intramural clinical investigations program was expanded to include work in ophthalmology.

1957—Training programs in otolaryngology and pediatric neurology began.

Field investigations involving collaborative and cooperative clinical studies began and the initial phase of the Collaborative Perinatal Project was started.

1960—The joint intramural basic research program of NINDB and the National Institute of Mental Health (NIMH) was divided and organized into 2 basic research laboratory programs.

1961—First program projects and clinical research centers in stroke and communicative disorders were supported.

1962—Funds were appropriated for professional and technical information assistance. Training grants in neurosurgery and neuroradiology were initiated.

1963—Developmental graduate training grants were initiated.

1965—A head injury research program was established.

1966—The stroke research program was expanded; additional grants for clinical research centers were awarded. An antiepileptic drug testing program began.

1967—Vision outpatient research centers were established. A program of research in neural control mechanisms and prostheses was initiated.

1968—The Institute was renamed the National Institute of Neurological Diseases and Stroke. The NINDS blindness program became the nucleus of the National Eye Institute.

1969—Research Building 36—dedicated by the U.S. Department of Health, Education, and Welfare (HEW) Secretary Robert H. Finch—was occupied by NINDS and NIMH research laboratories.

1971—Programs in applied neurological research (epilepsy, head injury), infectious diseases, and biometry were added to the Collaborative and Field Research Division.

1973—Two new communicative disorders programs began with establishment of an intramural Laboratory of Neuro-Otolaryngology and a section on communicative disorders in the Collaborative and Field Research Division.

1974—Laboratories for neuroimmunology and neuropharmacology were established.

1975—NINDS was renamed the National Institute of Neurological and Communicative Disorders and Stroke (NINCDS).

The Institute reorganized into 6 units for intramural research, fundamental neurosciences, communicative disorders, neurological disorders, stroke and trauma, and extramural activities.

1976—Dr. D. Carleton Gajdusek, chief, Laboratory of Central Nervous System Studies, was awarded the Nobel Prize in Physiology or Medicine for work on atypical slow viruses.

1979—A neuroepidemiology section and a section of neurotoxicology were established within the Intramural Research Program. NINCDS substantially expanded extramural support of research studies using positron emission tomography.

1982—The Institute's Neurological Disorders Program was replaced by 2 new program units: convulsive, developmental, and neuromuscular disorders and demyelinating, atrophic, and dementing disorders.

1984—NINCDS established the Senator Jacob Javits Neuroscience Awards, which provide research grant support for up to 7 years in the basic and clinical neurosciences and communicative sciences.

A Laboratory of Neurobiology and a Laboratory of Experimental Neuropathology were established within the Intramural Research Program.

1986—A Laboratory of Neural Regeneration and Implantation was established within the Intramural Research Program.

1987—NINCDS programs were renamed divisions, reflecting major areas of research interest: communicative and neurosensory disorders; convulsive, developmental, and neuromuscular disorders; demyelinating, atrophic, and dementing disorders; fundamental neurosciences; stroke and trauma; extramural activities; and intramural research.

A Clinical Neuroscience Branch was established within the Division of Intramural Research.

1988—The communicative disorders program became the nucleus of the National Institute of Deafness and Other Communication Disorders. NINCDS was renamed the National Institute of Neurological Disorders and Stroke.

1989—On July 25 President George H.W. Bush signed P.L. 101-58, declaring the 1990s the "Decade of the Brain."

1990—A Stroke Branch was established within the Division of Intramural Research.

1998—NINDS formed 7 planning panels comprising neuroscience leaders. Panel members outlined opportunities for research investment.

1999—NINDS published *Neuroscience at the New Millennium: Priorities and Plans for the NINDS, Fiscal Years 2000-2001*.

2000—The Parkinson's Disease Research Agenda was developed.

2001—NINDS celebrated its 50th anniversary with a 2-day scientific symposium, "Celebrating 50 Years of Brain Research: New Discoveries, New Hope."

The Stroke Progress Review Group was created.

The Research Agenda for Epilepsy was developed.

2002—The Report of the Stroke Progress Review Group was published.

2004—The new National Neuroscience Research Center opened.

2007—The NINDS launched a new strategic planning process, in which it convened external panels on basic, translational, and clinical research and on neurological diseases.

2008—The NINDS Division of Extramural Research created an Office of Translational Research and an Office of Clinical Research, each led by an Associate Director.

2009-10—As part of the American Recovery and Reinvestment Act of 2009, NIH received $10.4 billion to stimulate biomedical research over a 2-year period. NINDS's share ($400 million) was used to fund existing and peer-reviewed projects, and to support trans-NIH programs that solicited innovative ideas and research projects. (For more details visit www.ninds.nih.gov/recovery/overview.htm)

2010—The new NINDS Strategic Plan: "Priorities and Plans for the National Institute of Neurological Disorders and Stroke" was released.

2011—The NINDS Division of Extramural Research created an Office of Training, Career Development and Workforce Diversity, headed by a Chief, and an Office of Special Programs in Diversity, led by an Associate Director.

2012—A Pain Health Science Policy Advisor was established in the NINDS Office of the Director to serve as the Designated Federal Official for the Interagency Pain Research Coordinating Committee and to support the expanding programs of the NIH Pain Consortium.

NINDS LEGISLATIVE CHRONOLOGY

August 15, 1950—Public Law 81-692 established NINDB "for research on neurological diseases (including epilepsy, cerebral palsy, and multiple sclerosis) and blindness."

August 16, 1968—Public Law 90-489 renamed the NINDB the National Institute of Neurological Diseases.

October 24, 1968—Public Law 90-636 changed the name of the Institute to the National Institute of Neurological Diseases and Stroke.

October 25, 1972—Public Law 92-564 established a temporary National Commission on Multiple Sclerosis supported by NINDS.

March 14, 1975—Part 8 of a HEW Statement of Organization, Functions, and Delegations of Authority was amended to change the title of NINDS to the National Institute of Neurological and Communicative Disorders and Stroke.

July 29, 1975—Public Law 94-63 established 2 temporary commissions to be supported by NINCDS: Commission for the Control of Epilepsy and Its Consequences, and Commission for the Control of Huntington's Disease and Its Consequences.

October 28, 1988—Public Law 100-553 changed the name of NINCDS to the National Institute of Neurological Disorders and Stroke.

June 10, 1993—Public Law 103-43 added language on Multiple Sclerosis research to the legislative mandate of the NINDS.

November 13, 1997—Public Law 105-78, the Morris K. Udall Parkinson's Disease and Research Act, added language authorizing increased Parkinson's disease research and training, including research centers.

November 17, 2000—Public Law 106-310, the Children's Health Act of 2000, amended the Public Health Service Act with regard to a wide range of issues affecting children's health. Specifically relevant to the NINDS mission were authorizing provisions for the expansion of autism research, including research centers of excellence, and the establishment of an interagency Autism Coordinating Committee; the establishment of a Pediatric Research Initiative; the development of a pediatric research loan repayment program; the conduct of a national longitudinal study of environmental influences on children's health and development; the study of risk factors for childhood cancers, including malignant tumors of the central nervous system; the support of research with respect to cognitive disorders and neurobehavioral consequences arising from traumatic brain injury; and the expansion and coordination of muscular dystrophy research.

December 18, 2001—Public Law 107-084, the Muscular Dystrophy Community Assistance, Research, and Education Amendments of 2001, or the "MD-CARE Act," amended the Public Health Service Act to provide for the expansion and coordination of research with respect to various forms of muscular dystrophy, including the establishment of research centers of excellence and an interagency coordinating committee.

December 19, 2006—Public Law 109-416, the Combating Autism Act of 2006, amended the Public Health Service Act to expand and coordinate research activities with respect to autism spectrum disorders through the Centers of excellence and to establish the Interagency Autism Coordinating Committee.

October 8, 2008—Public Law 110-361, the Paul D. Wellstone Muscular Dystrophy Community Assistance, Research, and Education Amendments of 2008, reauthorizes programs at NIH with regard to muscular dystrophy, and designates the previously established research centers of excellence as Paul D. Wellstone Muscular Dystrophy Cooperative Research Centers.

March 30, 2009—Public Law 111-11, the Omnibus Public Land Management Act of 2009, which includes text of the Christopher and Dana Reeve Paralysis Act, authorizes the NIH Director to: coordinate paralysis research and rehabilitation activities at the NIH; establish consortia in paralysis research; and establish networks of clinical sites that will collaborate to design clinical rehabilitation intervention protocols and outcome measures on paralysis.

BIOGRAPHICAL SKETCH OF NINDS DIRECTOR STORY C. LANDIS, PH.D.

Dr. Landis has been Director of the National Institute of Neurological Disorders and Stroke since September 1, 2003. As Director, she oversees an annual budget of more than $1.6 billion and a staff of more than 900 scientists, physician-scientists, and administrators.

Dr. Landis received her B.A. in biology from Wellesley College in 1967 and her master's degree (1970) and her Ph.D. (1973) from Harvard University. She held postdoctoral fellowships at the National Institute of Mental Health and Harvard Medical School and also held faculty positions at Harvard Medical School and Case Western Reserve University. At Case Western Reserve, she was responsible for the creation of a Department of Neurosciences. Under 5 years of her leadership, the program achieved worldwide acclaim and a reputation for excellence. In 1995, Dr. Landis joined NINDS as Scientific Director and was responsible for the direction and excellence of research conducted in the Institute's intramural program. In 2007 Dr. Landis was named Chair of the NIH Stem Cell Task Force.

Dr. Landis' own research was aimed at understanding how functional connections form in the developing nervous system. She received distinction as an Established Investigator of the American Heart Association, a Javits Neuroscience Investigator, and a McKnight Senior Investigator, and as an elected Fellow of the American Academy of Arts and Sciences and the American Association for the Advancement of Science. Dr. Landis served on numerous scientific advisory committees, including selection and review committees for the NIH and the Howard Hughes Medical Institute. In 2002, she was named the President-Elect of the Society for Neuroscience, and was elected to the Institute of Medicine in 2009. She received the Morris K. Udall Award for Public Service from the Parkinson's Action Network in 2011.

NINDS DIRECTORS

Name	In Office from	To
Pearce Bailey	1951	1959
Richard L. Masland	1959	1968
Edward F. MacNichol, Jr.	September 1, 1968	1973
Donald B. Tower	May 31, 1974	February 1, 1981
Murray Goldstein	December 23, 1982	October 1, 1993
Patricia A. Grady (Acting)	September 1993	August 31, 1994
Zach W. Hall	September 1, 1994	December 31, 1997
Audrey S. Penn (Acting)	January 1, 1998	July 31, 1998
Gerald D. Fischbach	August 1, 1998	January 31, 2001
Audrey S. Penn (Acting)	February 1, 2001	August 31, 2003
Story C. Landis	September 1, 2003	Present

MAJOR DIVISIONS

The Institute is organized into a division of extramural research and a division of intramural research.

Division of Extramural Research

The Division of Extramural Research funds grants, cooperative agreements, and contracts to support research, research training, and career development. The Division is organized into work groups known as "program clusters," organized around critical, cross-cutting scientific topics that hold great promise for advancing knowledge and reducing the burden of neurological disease. The current scientific clusters are: Repair and Plasticity; Systems and Cognitive Neuroscience; Channels, Synapses, and Circuits; Neurogenetics; Neural Environment; and Neurodegeneration. In addition, the Extramural Division includes the Office of Translational Research; the Office of Clinical Research; the Office of Training, Career Development, and Workforce Diversity; the Office of International Activities; and the Office of Special Programs in Diversity.

The Division monitors developments in these program areas; assesses national needs for research on the causes, prevention, diagnosis, and treatment of disorders of the brain and nervous system; and pursues technological development, the application of research findings, and research training and career development. The Division also (a) determines program priorities, (b) collaborates with other institutes of the NIH on specific research efforts, (c) prepares reports and analyses of national needs to assist NINDS staff and advisory groups in carrying out their responsibilities and in developing new areas of emphasis, and (d) consults with extramural scientists, voluntary health organizations, and professional associations in identifying research needs and developing programs to meet these needs.

The Division coordinates training of young investigators in all basic and clinical neurological research areas. This includes institutional and individual training

programs as well as support through research career development awards and clinical investigator development awards.

Repair and Plasticity
http://www.ninds.nih.gov/funding/areas/repair_and_plasticity/index.htm

Mission:

- To understand mechanisms of plasticity in the healthy nervous system and to explore implications for repair.
- To develop interventions to modify the course of injury and disease progression, and improve functional outcome in individuals following injury to the nervous system.
- To understand the course of degeneration and repair following spinal cord injury and brain injury on timescales ranging from seconds to years.
- To develop interventions to permit spinal cord tracts to regrow past an injury site and establish functional connections distally.
- To understand the role of endogenous neurogenesis and to promote development of stem cell biology to repair the nervous system.
- To promote the development of neural prosthetic devices designed to restore function after neurological injury or disease.

Systems and Cognitive Neuroscience
http://www.ninds.nih.gov/funding/areas/systems_and_cognitive_neuroscience/index.htm

Mission:

- To encourage and support research on higher brain functions and the neural systems that mediate them, including neural plasticity, memory, cognition, movement, attention, regulation of the wakefulness-sleep cycle, food intake, body weight, sensory perception, and neuropathic pain.
- To support the understanding of the homeostatic regulation of cyclic and appetitive behaviors such as sleep, feeding, and drinking.
- To support the understanding of peripheral and central mechanisms of neuropathic pain and pain perception, and the development of strategies to alleviate chronic pain.
- To support and evaluate non-invasive functional imaging research such as PET (positron emission tomography) and fMRI (functional magnetic resonance imaging).
- To support and investigate the neural mechanisms of sensory and motor circuits that can be compromised by disease or injury.
- To support and evaluate novel tools and methodologies for system approaches.
- To support translational research of rehabilitative strategies and technology-driven therapeutics for neural dysfunction.

Channels, Synapses, and Circuits
http://www.ninds.nih.gov/funding/areas/channels_synapses_and_circuits/index.htm

Mission:

- To initiate and support basic and translational research on ion channels, transporters, and pumps implicated in neuronal function and disease.
- To advance basic and translational research in mechanisms of synaptic transmission, development, and plasticity, including research on function and dysfunction of the neuromuscular junction.
- To support basic, translational, and clinical studies in epilepsy and epileptogenesis.
- To implement the epilepsy benchmarks (http://www.ninds.nih.gov/funding/research/epilepsyweb/index.htm).
- To support research on the pathogenesis and treatment of inherited/acquired neuropathies, muscular dystrophies, and other neuromuscular disorders, including myasthenia gravis.
- To promote the development of new methodologies for basic research, including genetic models, high-resolution structural studies of membrane proteins, optical recording, neuroimaging, and neuroinformatics tools.

Neurogenetics
http://www.ninds.nih.gov/funding/areas/neurogenetics/index.htm

Mission:

- To promote investigation of the etiology, pathogenesis, diagnosis and treatment of neurogenetic or neurological disorders.
- To promote efforts to identify genes and susceptibility loci for neurological diseases.
- To promote investigation of the mechanisms by which genetic variants cause or contribute to risks for neurological disease.
- To develop gene-based assays, diagnostics, and therapeutics for neurological disorders.
- To develop cutting-edge tools and resources for neurogenetic research.
- To promote basic and translational research in neurogenetics and genomics.
- To investigate the genetic basis of normal neural development, function, and perturbations that can lead to neurological disorders.
- To promote and assist in the training of neuroscientists in molecular medicine.

- To educate the scientific and lay communities in the ethical, legal, and social issues in neurogenetics.
- To engage patient voluntary and advocacy groups in partnerships to promote research in neurogenetics.

Neural Environment
http://www.ninds.nih.gov/funding/areas/neural_environment/index.htm

Mission:

- To promote basic and clinical research on mechanisms of disease in nervous system disorders such as stroke, multiple sclerosis, brain tumor, prion disease, CNS infections, and neuroAIDS.
- To promote translational research, the development of diagnostics and of therapies that will prevent, arrest, or reverse neurological disorders such as stroke, multiple sclerosis, brain tumors, prion diseases, CNS infections, and neuroAIDS.
- To encourage studies on the role and functions of glial cells and cell cross-talk in stroke, multiple sclerosis, brain tumors, prion diseases, CNS infections, and neuroAIDS.
- To foster studies on vascular mechanisms of neurological disorders; vascular development in the central nervous system (CNS); and the role of microvascular endothelia, extracellular matrix, and cells of hematopoietic origin within the CNS.
- To expand studies on the mechanisms of blood-brain and brain-CSF barrier functions and of cell migration (and/or trafficking) into the CNS in stroke, immune disorders, brain tumors, and CNS infections.
- To encourage the development of animal models and assay systems that allow the study of neurological disorders such as stroke, multiple sclerosis, brain tumors, prion diseases, CNS infections, and neuroAIDS
- To promote the study of biomarkers for vascular, tumorigenic, and immune diseases of the nervous system such as stroke, multiple sclerosis, brain tumors, prion diseases, CNS infections, and neuroAIDS.

Neurodegeneration
http://www.ninds.nih.gov/funding/areas/neurodegeneration/index.htm

Mission:

- To stimulate basic, translational, and clinical research on the mechanisms of neurodegeneration underlying a wide range of disorders including Parkinson's disease and parkinsonian disorders, vascular cognitive impairment, amyotrophic lateral sclerosis and related motor neuron disorders, Huntington's disease, frontotemporal dementia, essential tremor, and Alzheimer's disease in partnership with the National Institute on Aging.
- To promote the development of representative models of human neurodegenerative diseases to support discovery research and therapy development.
- To encourage gene discovery and population-based genetic and epidemiological studies of neurodegenerative disorders in order to elucidate their causes and natural history, and to identify biomarkers.
- To promote the development of advanced research technologies necessary for achieving new breakthroughs in neurodegeneration research.

Office of Translational Research
http://www.ninds.nih.gov/funding/areas/technology_development/index.htm

Mission:

- To facilitate the preclinical discovery and development of new therapeutics or diagnostics for neurological disorders.
- To support research on promising candidate therapeutics and medical devices required to secure Investigational New Drug (IND) and Investigational Device Exemption (IDE) applications to the U.S Food and Drug Administration (FDA).
- To design, implement, and manage research infrastructure activities that support translational research.
- To support translational neuroscience projects by small businesses.
- To support ongoing trans-NIH translational research programs including those within the NIH Roadmap, the NIH Blueprint, and NIH Biodefense programs.

Office of Clinical Research
http://www.ninds.nih.gov/funding/areas/clinical_trials/index.htm

Mission:

- To promote the development of clinical interventions for neurological disorders and stroke.
- To stimulate the translation of findings in the laboratory to clinical research and clinical interventions.
- To ensure measures for protection of human subjects and safety monitoring.
- To encourage innovation in clinical research methodology.
- To support the development of neurology clinical researchers with training in biostatistics, epidemiology, and clinical trial methodology.
- To promote research into health disparities in neurological disorders.

Office of Training, Career Development and Workforce Diversity
http://www.ninds.nih.gov/funding/areas/training_and_career_development/index.htm

The Office of Training, Career Development, and Workforce Diversity (TCDWD) supports the training of students (high school, undergraduate and graduate), postdoctoral fellows, clinician-scientists, and faculty across NINDS research areas. The Office develops training opportunities and provides programmatic support through grant awards, local and national workshops, and direct consultation with applicants and awardees.

TCDWD also creates and supports programs to prepare diverse students and fellows to pursue research careers in neuroscience. Specific programs seek to enhance diversity of the neuroscience workforce by supporting individuals from underrepresented ethnic/racial minority groups or disadvantaged backgrounds, individuals with disabilities, and individuals re-entering the biomedical research workforce.

Office of International Activities
http://www.ninds.nih.gov/funding/areas/office_of_international_activities/index.htm

Mission:

- To identify significant global health issues as they relate to neurological disorders and stroke.
- To develop creative approaches that promote international research in the neurosciences.
- To stimulate international activities with other NIH Institutes and Centers, other domestic and foreign government agencies, and non-governmental organizations.
- To encourage international neuroscience collaborations, training, and capacity building through grants, short-term travel supplements, and international conferences.
- To coordinate bilateral and multilateral activities under agreements between the U.S. and other countries.

Office of Special Programs in Diversity
www.ninds.nih.gov/funding/areas/office_of_minority_health_and_research/index.htm

The Office of Special Programs in Diversity (OSPD) creates and implements programs that provide a diverse, inclusive, and highly engaged research workforce to conduct NINDS-funded research. To achieve the mission, OSPD supports ongoing and designs new programs that increase research faculty development, improve research infrastructure, and promote innovative approaches to enhance diversity through partnership with academic research institutions and diverse communities.

Division of Intramural Research

A full description of the NINDS Division of Intramural Research can be found at http://intra.ninds.nih.gov.

Additional information on NIH neuroscience programs, including programs sponsored by the NINDS, is available at http://neuroscience.nih.gov.

This page last reviewed on August 6, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
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Recent Photos from the National Institute of Nursing Research (NINR)

2012 PHOTOS

NINR Director Dr. Patricia A. Grady (l) presents the 2012 NINR Director's Lectureship Award to Dr. Elaine Larsen, Associate Dean for Research and Professor of Pharmaceutical and Therapeutic Research at the Columbia University School of Nursing and Professor of Epidemiology, Columbia University Mailman School of Public Health, for delivering the 2nd Annual NINR Director's Lecture. The title of her presentation was "Infection Prevention: An Interdisciplinary Team Approach."
lo-res | hi-res

NINR Division of Intramural Research "alumna" Jessica Gill, PhD, CRPNP, returned to NINR in 2012 as one of the first Lasker Clinical Research Scholars. The new Lasker Clinical Research Scholars Program, a joint initiative of the National Institutes of Health and the Albert and Mary Lasker Foundation, is the premier clinical intramural research training program at NIH.
lo-res | hi-res

2011 PHOTOS

NINR Director Dr. Patricia A. Grady (4th from l) with "The Ethics of Science at the End of Life: A Town Hall Discussion" panelists (from l) Dr. Joseph Fins, Dr. Nancy Berlinger, Dr. Karla FC Holloway, Susan Dentzer, and Dr. Marie Hilliard.
lo-res | hi-res

Panelists at the NINR 25th Anniversary Concluding Symposium include (from l) Dr. J. Randall Curtis, Dr. Kathleen Dracup, Dr. Martha Curley, Dr. Marjana Tomic-Canic and Dr. Sandra Dunbar.
lo-res

Dr. Rita Colwell, distinguished university professor at the University of Maryland and Johns Hopkins University Bloomberg School of Public Health, emcees NINR's 25th Anniversary Concluding Symposium.
lo-res

2010 PHOTOS

NINR director Dr. Patricia A. Grady (l) with NIH Director Dr. Francis Collins (c) at the May 2010 meeting of the National Advisory Council for Nursing Research. (Michael Spencer, photographer)
lo-res | hi-res

NINR Director Dr. Patricia A. Grady (c) with the graduating class of the 2010 NINR Summer Genetics Institute. (Charles Rose, photographer)
lo-res | hi-res

NINR Director Dr. Patricia A. Grady (r), with former NINR Director Dr. Ada Sue Hinshaw (c), and NINR Deputy Director Dr. Mary E. Kerr (l), at the unveiling of Dr. Hinshaw's portrait during the NINR 25th Anniversary Kickoff Science Symposium. (September 2010).(Michael Spencer, photographer)
lo-res | hi-res

2009 PHOTOS

The graduating class of the 2009 NINR Summer Genetics Institute, July 2009
lo-res | hi-res

NINR Director Dr. Patricia A. Grady, speaking at the Oklahoma Statewide Nursing Research Day conference, April 2009. (Photo supplied by: Beverly Bowers, PhD, RN, CNS, University of Oklahoma, College of Nursing)
lo-res | hi-res

NINR director Dr. Patricia A. Grady addresses the NIH Partners in Research investigator workshop, October 2009. Dr. Howard K. Koh, Assistant Secretary for Health in the U.S. Department of Health and Human Services, also spoke at this workshop.
lo-res | hi-res

2008 PHOTOS

NINR Director Dr. Patricia A. Grady receives an honorary doctor of science degree in June 2008 from Dr. John C. LaRosa, president of the State University of New York Downstate Medical Center.
lo-res | hi-res

NINR director Dr. Patricia A. Grady (l) with former First Lady Rosalynn Carter at the Friends of NINR NightinGala, held in October 2008 in Washington, D.C. Hosted by the Friends of the National Institute of Nursing Research, this annual event celebrates nursing science and NINR. (Photo by James Tkatch)
lo-res | hi-res

NINR Deputy Director Dr. Mary Kerr (2nd from r) during an outreach visit to Alaska in October 2008 with members of the NIH Office of Equal Opportunity and Diversity Management and the NIDDK Office of Minority Health Research Coordination. The NIH representatives met with state government and university officials, health care professionals and students, and members of the Alaska Native/American Indian (AN/AI) community to provide information about NIH research and training opportunities and to learn about the health conditions and needs of the AN/AI population.
lo-res

Dr. Anne Ersig (r), NINR's first graduate from its Graduate Partnership Program in Biobehavioral Research, receives her certificate in November 2008 from NINR Deputy Director Dr. Mary Kerr. (Photo by Michael Spencer, NIH)
lo-res | hi-res

2007 PHOTOS

NINR Director Dr. Patricia A. Grady speaks at a science symposium launching a year-long celebration of the Institute's 20th Anniversary. The celebration officially concluded in October 2006.
lo-res | hi-res

NINR Director Dr. Patricia A. Grady (seated, third from right) with the 2007 National Advisory Council for Nursing Research.
lo-res | hi-res

This page last reviewed on May 28, 2013

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National Institute of Nursing Research

Mission | Important Events | Legislative Chronology | Director | Programs | Photo Gallery

MISSION

The mission of the National Institute of Nursing Research (NINR) is to promote and improve the health of individuals, families, communities, and populations. NINR supports and conducts clinical and basic research and research training on health and illness across the lifespan to build the scientific foundation for clinical practice, prevent disease and disability, manage and eliminate symptoms caused by illness, and improve palliative and end-of-life care.

NINR's research programs, both extramural and intramural, incorporate a broad range of interdisciplinary approaches designed to promote scientific exploration that will lead to better health outcomes and health services. Such approaches include: clinical intervention studies; translational and implementation research. As part of its commitment to advancing the health of all populations, NINR funds research that promotes health equity and eliminates health disparities by investigating the interplay of behavioral, biological, and environmental determinants of health and wellness, with a special emphasis on underserved and resource-limited communities. NINR also maintains a focus on basic research, seeking to improve knowledge of underlying biological systems, including the genetic and genomic contributions to symptoms and health conditions.

NINR also places great emphasis on research training to cultivate the next generation of nurse scientists. NINR-supported opportunities for research training are available for students beginning their research careers, as well as for scientists seeking to expand their research expertise. Among these opportunities, NINR provides support for trainees from underrepresented and disadvantaged backgrounds.

NINR fosters collaborations with many other disciplines in areas of mutual interest such as long-term care for older adults, the special needs of women across the lifespan, genetics and genomics, biobehavioral aspects of the prevention and treatment of infectious diseases, and the impact of environmental influences on risk factors for chronic illnesses, among many others. NINR also supports interdisciplinary team science initiatives through its involvement with the NIH Clinical and Translational Science Awards (CTSA) program.

The NINR Strategic Plan: An Overview

Released in October 2011, *Bringing Science to Life: NINR Strategic Plan*, describes NINR's approach for advancing the "science of health." It seeks to leverage 25 years of nursing science accomplishments to pave the way for future discoveries in scientific areas that have the greatest potential to impact the health of the Nation. Developed with the input of scientists, clinicians, experts in health care and public policy, other stakeholders, and members of the public, the Plan also provides a vision for the next quarter century of nursing science achievements. NINR's focus on research that supports the science of health, which encompasses the investigation of multiple health determinants—including psychological, physiological, genomic, environmental, familial, societal, and cultural factors—is based on the premise that individuals would benefit from being actively involved in maintaining their own health through the prevention of disease and self- management of illness.

To advance the science of health, NINR invests in research to:

- Enhance health promotion and disease prevention
- Improve quality of life by managing symptoms of acute and chronic illness
- Improve palliative and end-of-life care
- Enhance innovation in science and practice
- Develop the next generation of nurse scientists

IMPORTANT EVENTS IN NINR HISTORY

November 10, 1985—Public Law 99-158, the Health Research Extension Act of 1985, became law, overriding a presidential veto. Among other provisions, the law authorized the National Center for Nursing Research (NCNR) at NIH.

April 18, 1986—The U.S. Department of Health and Human Services (HHS) Secretary announced the establishment of NCNR at NIH.

April 1986-June 1987—Dr. Dorris Merritt, Special Assistant to the NIH Director, was appointed the Acting Director of NCNR. NCNR's initial budget was $16 million.

December 3, 1986—The HHS Secretary appointed the first members of the NCNR Advisory Council.

February 17, 1987—The NCNR Advisory Council held its inaugural meeting.

June 1987-June 1994—Dr. Ada Sue Hinshaw was appointed the first Director of NCNR.

May 30, 1988—The NCNR Advisory Council was renamed the National Advisory Council for Nursing Research.

1992—NINR-funded researcher Dr. David Olds established that visits by home nurses significantly lower mothers' high blood pressure during pregnancy and result in better timing of subsequent pregnancies. Abuse and neglect of children were also reduced.

June 10, 1993—P.L. 103-43, the NIH Revitalization Act of 1993, became law. Among other provisions, it elevated NCNR to full status as an NIH Institute.

June 14, 1993—The HHS Secretary signed the Federal Register notice establishing the National Institute of Nursing Research (NINR).

July 1994-April 1995—Dr. Suzanne Hurd served as Acting Director of NINR.

1994—NINR-funded researcher Dr. Loretta Sweet Jemmott tested several gender-appropriate, culturally sensitive interventions on hard-to-reach vulnerable populations and significantly reduced sexual risk behaviors for HIV. Her "Be Proud! Be Responsible!" intervention became the Centers for Disease Control and Prevention's model curricula

April 3, 1995—Dr. Patricia A. Grady was appointed Director of NINR.

1997—The NIH Director designated NINR as the lead NIH institute to coordinate collaborative research on end-of-life care.

1998—NINR-funded researcher Dr. Joanne Harrell, building on research that showed risk for cardiovascular disease can begin at an early age, demonstrated that a specially designed classroom educational program for elementary school children could significantly lower their cholesterol levels in just eight weeks. NINR-funded researcher Dr. Nancy Bergstrom, in a multi-site study, tested the Braden scale for risk of pressure sores and found its predictive capability accurate. The scale is now widely used in nursing homes and hospitals.

1999—NINR-funded researcher Dr. Mary Naylor demonstrated that transitional care from hospital to home could significantly improve the health of older adult patients and substantially reduce per patient days in hospital, hospital readmissions, and costs to the health care system. NINR-funded researcher Dr. Jon Levine established that gender plays a key role in pain relief, with women obtaining satisfactory relief from kappa-opioids while men receive little benefit.

Summer 2000—NINR held its first Summer Genetics Institute.

2002—NINR funded researcher Dr. Linda Aiken demonstrated that hospital working conditions and adequacy of nurse staffing per patient can affect patients' recovery and that in hospitals where nurses have lower patient workloads, patients have substantially lower mortality rates.

April 2002—NINR launched a free online training, "Developing Nurse Scientists" to acquaint students interested in nursing research with the field.

2003—NINR Director Dr. Patricia A. Grady named co-chair of the Interdisciplinary Research component of the NIH Roadmap for Medical Research and co-chair of the NIH Pain Consortium.

2003—NINR-funded researcher Dr. Martha Hill found that interventions conducted at the community level by a multidisciplinary health care team reduced high blood pressure in young inner city African-American males, who are typically underserved by the health care system, illustrating that culturally sensitive, successful interventions can be conducted for vulnerable populations and can help reduce health care disparities.

2004—NINR Director Dr. Grady named co-chair of NIH Public Trust Initiative.

2004—NINR launched a new pilot training project, the Graduate Partnerships Program (GPP) in Biobehavioral Research.

December 2004—NINR co-sponsored the NIH State of the Science conference, *Improving End-of-Life Care*, bringing together almost 1,000 health care practitioners from around the world.

2005-6—NINR celebrated its 20th anniversary at NIH.

2006—NINR-funded researcher Dr. Bernadette Melnyk demonstrated that her Creating Opportunities for Parent Empowerment (COPE) program, which aims to support the parents of premature infants, resulted in improved knowledge and parenting behaviors, decreased parental stress, and shortened length of NICU stays by about four days, reducing health care costs associated with premature births by about $4,800 per infant. COPE has been adopted by hospitals and insurers throughout the U.S.

2007—NINR-funded researcher Dr. J. Randall Curtis and collaborators reported that an intervention to improve communication between ICU clinicians and family members of dying patients significantly reduced feelings of stress, anxiety, depression, and other symptoms of post-traumatic stress disorder in the family members for up to three months after the loss of their loved one.

2008—NINR Director Dr. Grady named co-chair, Science of Behavior Change Roadmap Initiative.

2008—First two NINR Graduate Partnerships Program fellows graduated.

2009—NINR published an award-winning patient information brochure, "Palliative Care: The Relief You Need When You're Experiencing the Symptoms of Serious Illness."

2009—NINR-funded researcher Dr. Pamela Mitchell reported that a behavioral intervention called Living Well with Stroke reduced the incidence of depression in stroke survivors, both immediately after treatment for stroke and at a one-year follow up.

2009—Using the unprecedented additional funding made available through the American Recovery and Reinvestment Act, NINR supported an additional $36 million in research in fiscal year 2009-2010. Projects supported under ARRA included a new research cooperative for palliative care science and multiple training opportunities to build the scientific workforce. Approximately 73 additional research grants were supported, along with multiple research and training supplements.

2010—NINR intramural researcher Dr. Taura Barr identified a gene panel useful for stroke diagnostics and outcome prediction as well as other neurological conditions such as traumatic brain injury. Her work may lead to the development of bedside tests for assessment of the extent of brain injury and to guide individualized therapeutics. NINR intramural researcher Dr. Wendy Henderson developed a devise for collecting patient-reported outcomes related to pain called the "Gastrointestinal Pain Pointer" (GIPP), enabling a patient to describe the location, intensity, and subjective components of their pain on a graphic interface. These data are then captured electronically for quantification and comparison to later reports of pain.

2010—NINR held the first Methodologies Boot Camp, focusing on pain research.

2010—First NINR history book released: *NINR: Bringing Science to Life*.

2010-11—NINR celebrated its 25th anniversary at NIH with a series of scientific events.

2011—NINR launched a new annual NINR Director's Lecture series, designed to bring the nation's top nurse scientists to the NIH campus to share their work and interests with a transdisciplinary audience. Dr. Bernadette Melnyk presented the inaugural lecture on "COPE: Improving Outcomes for Premature Infants and Parents."

January 2011—NINR established a YouTube channel, "NINR News," to post videos highlighting its events and trainings.

August 11-12, 2011—NINR convened a national summit on "The Science of Compassion: Future Directions in End-of-Life and Palliative Care," attended by nearly 1,000 scientists, health care professionals, and public advocates.

October 13, 2011—*Bringing Science to Life: NINR Strategic Plan* released at NINR's 25th Anniversary Concluding Symposium.

November 2011—NINR published Spanish-language public education brochure: *Cuidados Paliativos: El alivio que necesita cuando tiene síntomas de una enfermedad grave* (*Palliative Care: The Relief You Need When You're Experiencing the Symptoms of Serious Illness*).

January 2012—Dr. Elaine Larson delivered the 2nd Annual NINR Director's Lecture on "Infection Prevention: An Interdisciplinary Team Approach."

March 2012—NINR launched the Video Grantsmanship Workshop, designed to help pre- and post-doctoral students and early career nurse scientists learn the basics of grantsmanship, on its YouTube channel and website.

April 2012—NINR-supported researcher Dr. Marilyn Rantz found that, in a trial of an early warning sensor system that alerts nurses to declining health, long-term care residents participating in the intervention demonstrated better functional measures (e.g., hand-grip; gait) than did residents receiving usual care.

October 2012—Dr. Jessica Gill joined NINR as one of the first Lasker Clinical Research Scholars, the premier clinical intramural training program at NIH.

NINR LEGISLATIVE CHRONOLOGY

November 10, 1985—P.L. 99-158, the Health and Research Extension Act of 1985, became law. Its provisions included the establishment of NCNR to support research and research training related to patient care.

1986—A series of continuing resolutions (P.L. 99-500, P.L. 99-599) established NCNR as a separate NIH appropriation.

June 10, 1993—NCNR was redesignated as an NIH institute under a provision in P.L. 103-43, the NIH Revitalization Act of 1993.

2010—U.S. Senate resolution, S. Res. 642, congratulated NINR on a quarter century of achievement in science and public service. The resolution was introduced by Senator Daniel Inouye (D-Hawaii) and cosponsored by Senator Susan Collins (R-Maine).

BIOGRAPHICAL SKETCH OF NINR DIRECTOR PATRICIA A. GRADY, PH.D., R.N.

Dr. Patricia A. Grady was appointed Director, NINR, on April 3, 1995. She earned her undergraduate degree in nursing from Georgetown University in Washington, DC. She pursued her graduate education at the University of Maryland, receiving a master's degree from the School of Nursing and a doctorate in physiology from the School of Medicine.

An internationally recognized researcher, Dr. Grady's scientific focus has primarily been in stroke, with emphasis on arterial stenosis and cerebral ischemia. She was elected to the Institute of Medicine in 1999 and is a member of several scientific organizations, including the Society for Neuroscience, the American Academy of Nursing, and the American Neurological Association. She is also a fellow of the American Heart Association Stroke Council.

In 1988, Dr. Grady joined NIH as an extramural research program administrator in the National Institute of Neurological Disorders and Stroke (NINDS) in the areas of stroke and brain imaging. Two years later, she served on the NIH Task Force for Medical Rehabilitation Research, which established the first long-range research agenda for the field of medical rehabilitation research. In 1992, she assumed the responsibilities of NINDS Assistant Director. From 1993 to 1995, she was Deputy Director and Acting Director of NINDS. Dr. Grady served as a charter member of the NIH Warren Grant Magnuson Clinical Center Board of Governors.

Before coming to NIH, Dr. Grady held several academic positions and served concurrently on the faculties of the University of Maryland School of Nursing and School of Medicine.

Dr. Grady has authored or co-authored numerous articles and papers on hypertension, cerebrovascular permeability, vascular stress, and cerebral edema. She is an editorial board member of the major stroke journals. Dr. Grady lectures and speaks on a wide range of topics, including future directions in nursing research, developments in the neurological sciences, and Federal research opportunities.

Dr. Grady has been recognized with several prestigious honors and awards for her leadership and scientific accomplishments, including the first award of the Centennial Achievement Medal from Georgetown University School of Nursing and Health Sciences, being named the inaugural Rozella M. Schlotfeld distinguished lecturer at the Frances Payne Bolton School of Nursing at Case Western Reserve University, and receiving the honorary degree of Doctor of Public Service from the University of Maryland. Dr. Grady was named the Excellence in Nursing Lecturer by the Council on Cardiovascular Nurses of the American Heart Association. In 2005, Dr. Grady received Doctor of Science, Honoris Causa degrees from the Medical University of South Carolina and Thomas Jefferson University, and Columbia University School of Nursing honored her with its prestigious Second Century Award for Excellence in Health Care. In 2008, Dr. Grady received a Doctor of Science, Honoris Causa degree from the State University of New York Downstate Medical Center. View Image.

In 2011, Dr. Grady was named one of the 100 Most Powerful Women in Washington by *Washingtonian Magazine* and received Arizona State University's College of Nursing and Health Innovation's Discover Award, which honors those who are dedicated to improving the health of the American public and who "pursue big dreams, lead innovative changes, and achieve their goals." This was followed in 2012 by the University of California-Los Angeles School of Nursing's Sterling Award, presented in recognition of "superior achievement in science and health" by those who have taken "great strides in promoting and improving health across the nation through scientific research and leadership in health communities."

Dr. Grady is also a past recipient of the NIH Merit Award and received the Public Health Service Superior Service Award for her exceptional leadership.

NINR DIRECTORS

Name	In Office from	To
Doris H. Merritt (Acting)	April 18, 1986	June 1987
Ada Sue Hinshaw	June 6, 1987	June 30, 1994
Suzanne S. Hurd (Acting)	July 1, 1994	April 2, 1995
Patricia A. Grady	April 3, 1995	Present

MAJOR PROGRAMS

Division of Extramural Activities

The Division of Extramural Activities consists of the Office of Extramural Programs, the Office of Grants Management, and the Office of Review.

The Office of Extramural Programs (OEP) manages the funding activities of NINR that occur outside of NIH, in research institutions across the country and around the world. A major program priority is the integration of biological and behavioral research. Three foci—promoting health and preventing disease, managing the symptoms and disability of illness, and improving the environments in which care is delivered—cut across NINR's science areas.

The Office of Grants Management (OGM) is the central point of contact for all business-related activities associated with the negotiation, award, and administration of grants and cooperative agreements within NINR.

The Office of Review (OR) provides policy direction and coordination for the planning and execution of initial scientific and technical reviews conducted within NINR. The reviews conducted by the office are considered to be first level reviews, and involve panels of experts established according to scientific disciplines or current research areas for the purpose of evaluating the scientific and technical merit of grant applications.

Research Centers Program

The OEP oversees a nationwide Research Centers program. These Centers bring together scientists, students, and other colleagues with similar interests to focus on a common area of investigation, such as symptom management in chronic diseases, nursing outcomes, or end-of-life care. They also serve to advance the NINR goals of building research infrastructure, expanding research capacity, and increasing training opportunities. The focus of currently funded centers includes Building the Science of Self-Management, End-of-Life Transition Research, Pain Studies, Evidence-based Practice in the Underserved, Sleep Disturbances, and Promotion of Cardiovascular Health.

The Research Centers represent a continuum of institutional research programs at different stages of development, each with unique needs and potential. They are funded through three grant mechanisms:

- Exploratory Center (P20) grants target schools of nursing with emerging research programs, helping them to expand their early research efforts, centralize resources, strengthen research capabilities, and increase productivity to generate new research.
- Core or Center of Excellence (P30) grants, designed for institutions with several years of demonstrated research success, support interdisciplinary collaborative research programs among established investigators in specific areas of basic and/or clinical research of strategic interest to NINR.
- Although technically distinct from Centers, Research Program Project (P01) grants are available to a group of investigators at institutions with proven and long-established records of research. These investigators generally have differing areas of expertise and wish to collaborate in research by pooling their talents and resources. Program project grants are organized around a set of closely related projects related to a well-defined scientific problem, and are designed to achieve results not attainable by a single investigator working independently.

Extramural Research Training and Career Development

Through its OEP, NINR offers a range of extramural training awards and opportunities.

Fellowships

The National Research Service Awards (NRSA) enable scientists to be trained to conduct independent nursing research and to collaborate in interdisciplinary research through individual and institutional predoctoral, postdoctoral, and senior fellowships. NINR currently supports F31, F32, F33, and T32 mechanisms of funding for fellowship grants.

Career Development Awards

NINR supports several career development awards funded through the K01, K23, K24, and K99 mechanisms.

For postdoctoral and established investigators, the K01 Mentored Research Scientist Development Award provides for a period of additional mentored research experience with an expert sponsor as a way to gain expertise in an area new to the candidate or would demonstrably enhance the candidate's scientific career. NINR also supports research career awards that offer mentored research experiences for trainees from underrepresented and disadvantaged backgrounds. Also funded by the K01 training mechanism, investigators have addressed such issues as serious developmental problems in Mexican migrant infants; culturally appropriate community-level suicide prevention programs for American Indian rural youth; improvement of awareness of prostate cancer screening among African American men; and ways to identify triggers or markers for increased risk for sudden death in Asian heart failure patients.

NINR participates in the NIH Pathway to Independence (PI) Award, which offers another excellent opportunity for highly promising, postdoctoral research scientists. This award uses the combination K99/R00 funding mechanism and is designed to facilitate receipt of an R01 award earlier in an investigator's research career. The PI Award provides up to 5 years of support consisting of 2 phases: 1-2 years of mentored support, followed by up to 3 years of independent support for career transition, contingent on securing an independent research position. Topics NINR has funded range from improving cognitive impairment in older adults with heart failure to discovering biomarkers of pulmonary infection in the critically ill, to understanding access to hospice care. Award recipients will be expected to compete successfully for independent R01 support from NIH during the career transition period.

Other career development awards offered by NINR's OEP include the Mentored Patient-oriented Research Career Development Award (K23); the Translational Scholar Career Award in Pharmaco-genomics and Personalized Medicine (K23); and the Midcareer Investigator Award in Patient-Oriented Research (K24).

For students considering a research career, NINR offers a CD-ROM program titled "Discover Nursing Research." This program presents interviews with nurse scientists and their doctoral students as a way to improve understanding of the scope of nursing science and recruit nurses into research careers. Copies are available upon request.

Division of Intramural Research

NINR maintains a robust intramural program on the NIH campus in Bethesda, Maryland, dedicated to conducting basic and clinical research on the interactions among molecular mechanisms underlying a single symptom or cluster of symptoms and environmental influences on individual health outcomes. It encompasses the individual variability inherent in symptoms associated with digestive disorders, cancer-related fatigue, sarcoidosis, traumatic brain injury, and post-traumatic stress disorders as well as clinical interventions to alleviate these symptoms.

NINR's laboratories leverage the benefits of the highly collaborative research environment of the NIH intramural research community, wherein scientific partnerships can be readily established and the nursing science community can take full advantage of resources, infrastructure, and mentoring opportunities available at NIH. The Division of Intramural Research (DIR) consists of the Office of the Scientific Director and three branches: Tissue Injury, Symptom Management, and Biobehavioral. The DIR also offers several research training opportunities.

Tissue Injury Branch

The Tissue Injury Branch conducts clinical and laboratory-based studies on the mechanisms of tissue injury, including the identification of molecular targets and pathways activated in response to cellular damage, to provide greater understanding of the pathophysiology associated with tissue injury and identify novel targets for therapeutic intervention.

The Tissue Injury Branch currently consists of three units: **Brain Injury, Vascular Biology, and Muscle Disease**.

The **Brain Injury Unit** examines the risks for post-concussive syndrome and post-traumatic stress disorder (PTSD) following a traumatic brain injury (TBI). The

purpose of this unit's research is to design screening methods to approximate psychological and neurological risks following TBI and to design interventions to mitigate risks and treat early symptoms.

The **Vascular Biology Unit** focuses on dietary factors and nutrients that are associated with the development of cardiovascular disease and symptoms, the role of nutrition interventions, and personalized nutrition based on individual genomic profiles.

The **Muscle Disease Unit** focuses on the measurement and treatment of symptoms associated with various forms of congenital muscle disease, including Collagen 6 Related Myopathy, *LAMA2* Related Muscular Dystrophy, and RYR1 Congenital Myopathy.

Symptom Management Branch

The Symptom Management Branch is dedicated to improving the understanding of the underlying biological mechanisms of a range of symptoms, their effect on patients, and the biological and behavioral basis for how patients respond to interventions.

The Symptom Management Branch consists of two units: **Symptom Biology** and **Cardiovascular Symptoms**.

The **Symptom Biology Unit** examines the nature and causes of fatigue in relation to conditions such as sarcoidosis and in association with cancer treatments and pain associated with fibromyalgia.

The **Cardiovascular Symptoms Unit** focuses on vasculoprotective nutritional interventions that may improve the lipid profile in hyperlipidemia and decrease high blood pressure in hypertension.

Biobehavioral Branch

The Biobehavioral Branch supports research into the interplay of behavioral, biological, and environmental determinants of health and wellness across populations. The Biobehavioral Branch consists of two units: **Digestive Disorders** and **Clinical Neuroscience**.

Digestive Disorders Unit seeks to understand the mechanisms involved in symptom distress related to digestive disorders, specifically the biobehavioral relationships between inflammation and patient symptoms, in order to identify genetic or other biologic/physiologic factors that predict patient-related clinical outcomes.

The **Clinical Neuroscience Unit** examines the influence of circadian rhythms on symptoms such as pain and fatigue across conditions and populations. Research includes studies examining genomic profiles to illuminate the determinants of sleep and circadian rhythm in prostate cancer patients prior to and throughout the treatment process.

The Biobehavioral Branch consists of two units: **Biobehavioral** and **Clinical Neuroscience**.

The focus of research in the **Biobehavioral Unit** is to more fully understand the mechanisms involved in symptom distress related to digestive disorders, specifically the biobehavioral relationships between inflammation and patient symptoms. It seeks to identify genetic or other biologic/physiologic factors that predict patient-related clinical outcomes. The **Clinical Neuroscience Unit** seeks to better understand the influence of circadian rhythms on symptoms such as pain and sleep.

Intramural Research Training and Career Development

NINR is committed to developing the next generation of nurse scientists and provides research training through several mechanisms. Post-baccalaureate training positions are available that allow BSN-prepared nurses interested in exploring a career in research to spend a year engaged in biomedical investigation in the DIR laboratories. Pre- and postdoctoral fellowship positions, as well as summer internships, are also available.

NINR also offers mentored research support to post-doctoral intramural investigators via the K99 mechanism. Known as the Pathway to Independence Award, it is designed to facilitate receipt of an R01 award earlier in an investigator's research career.

The DIR also supports the Graduate Partnerships Program (GPP). The NINR GPP is a doctoral fellowship training program that coordinates training and funding for PhD students attending a school of nursing. The program combines the academic environment of a university with the breadth and depth of research resources available at NIH. The goal is to encourage and support the training of nursing doctoral students who are motivated to undertake careers in basic or clinical research.

Through the DIR, NINR sponsors the Summer Genetics Institute (SGI), an intensive research training program, an intensive research training program held at NIH. The SGI provides a foundation in molecular genetics for use in research and clinical practice and features both lecture and hands-on laboratory training. The purpose of the SGI is to increase the research capability among graduate students and faculty, and develop and expand the basis for clinical practice in genetics among clinicians. The program awards eight hours of graduate-level college credit. SGI graduates are making a difference in their communities in many ways. They are successfully building programs of research in genetics related to nursing (e.g., genetic components involved in organ transplantation outcomes, gene-to-gene and gene-environment interactions in childhood asthma); disseminating findings through publications and scientific conference presentations; and integrating genetics content into nursing school curricula across the country.

The NINR DIR also participates in the NIH Lasker Clinical Research Scholar (Lasker Scholar) program. The Lasker Scholar program supports a small number of exceptional clinical researchers in the early stages of their careers to promote their development to fully independent scientists. It combines a period of research experience as a tenure-track Principal Investigator in the NIH IRP with an opportunity for additional years of independent financial support, either within the IRP or at an extramural research institution.

NINR's DIR also offers a free research training workshop, "Developing Nurse Scientists, " which provides participants with the knowledge and skills needed to submit

competitive grant applications to NIH for research funding. Available online at NINR's website, the workshop is targeted to doctoral nursing students and nurses of any level who are interested in returning to school to pursue a career in research.

The NINR brochure *Research Training Grants and Opportunities* (PDF- 573 KB) provides an overview of both the extramural and intramural training programs offered by NINR. NINR also offers a video-based grantsmanship workshop via its YouTube channel and the NINR website. The workshop's seven modules are geared to pre- and post-doctoral students and early career nurse scientists.

Leadership in End-of-Life Research

In recent years, many factors have converged to increase public and professional interest in issues surrounding the end of life.

The 1997 report from the Institute of Medicine, *Approaching Death: Improving Care at the End of Life*, found widespread dissatisfaction with end-of-life care and many gaps in our scientific knowledge of this phase of life. In response, NINR sponsored a workshop on the symptoms of terminal illness. Later that year, the NIH Director designated NINR as the lead Institute within NIH for end-of-life research. NINR studies on the management of pain and other symptoms, family decision-making, caregiving, advance planning, and quality of care for the elderly and critically ill provided an important base of knowledge on which to build. NINR has sponsored several community events to gather input on concerns related to end-of-life issues.

In December 2004, NINR co-sponsored the NIH State of the Science conference, *Improving End-of-Life Care*, bringing together almost 1,000 health care practitioners from around the world. This conference served to evaluate the current state of the science in end-of-life care and to determine future directions for research. It also highlighted the interactions among patients, caregivers, and the health system, and their effects on outcomes. The consensus statement from this conference is available here.

In 2009, NINR released a patient information brochure entitled: "Palliative Care: The Relief You Need When You're Experiencing the Symptoms of Serious Illness." (PDF-15.5 MB) In 2011, it released the Spanish version: Cuidados Paliativos: El alivio que necesita cuando tiene síntomas de una enfermedad grave. Both brochures are copyright free and may be downloaded and reproduced without charge from NINR's Publications webpage. To order print copies or printer files to produce larger quantities, please email info@ninr.nih.gov or call 301-496-0207.

In 2011, NINR convened a three-day, trans-NIH national summit on "The Science of Compassion: Future Directions in End-of-Life and Palliative Care. " This summit was intended to examine the state of research and clinical practice in end-of-life and palliative care (EOL PC). With speakers from multiple disciplines and almost 1,000 registrants, it also provided an opportunity for scientists, health care professionals, and public advocates to gather together, talk, and network. The summit commenced with the NIH Institute-led public forum "The Ethics of Science at the End of Life: A Town Hall Discussion." An executive summary and videocast of summit highlights are available on NINR's website at http://www.ninr.nih.gov/scienceofcompassion.

NINR participates as a member of the NIH End of Life and Palliative Care Special Interest Group (EOL PC SIG). Membership is open to anyone with a shared interest in EOL PC science, including researchers across NIH ICs, academia, fellows/trainees, clinicians, students, and interested professionals and non-scientists. The NIH EOL PC SIG serves as an important source for ideas and inter-institute discussions of ongoing activities in end-of-life and palliative care research, and provides a forum to foster career development, investigator training, and opportunities to collaborate in new initiatives.

Supported by a trans-NIH organizing committee from NCI, NINR, NHLBI, NCCAM, NIA, and the NIH Clinical Center, the NIH EOL PC SIG meets four times a year on the NIH campus. Lectures and discussions reflect emerging scientific issues such as challenging research methodologies, new technologies, interventions, treatments, resources, and training. The group also has a listserv that exchanges EOL PC research information, grant opportunities, news items, and educational events.

For more information or to subscribe to the listserv, please visit the NIH EOL PC SIG website at: http://sigs.nih.gov/eolpc.

NINR and Trans-NIH Initiatives

NINR plays an active role in several trans-NIH initiatives, including the:

- NIH Pain Consortium
- NIH Neuroscience Blueprint
- NIH Science of Behavior Change Roadmap initiative
- NIH Basic Behavioral and Social Science Opportunity Network (OppNet)
- NIH Common Fund's Health Economics Working Group
- NIH Health Care Systems Research Collaboratory Work Group

NINR is a key member of the NIH Pain Consortium, for which Dr. Grady serves on the Executive Committee. The consortium promotes collaboration among the many NIH Institutes and Centers that conduct or fund pain research. NINR is also a member of the NIH Neuroscience Blueprint, which is designed to develop resources (i.e., people, tools, methods, knowledge bases) for the advancement of research in neuroscience. NINR involvement in these areas opens further avenues of research to NINR-supported investigators.

NINR is a co-sponsor of the Science of Behavior Change (SOBC) Roadmap initiative, and Dr. Grady serves as an SOBC Roadmap Development co-chair. Advancing the science of behavior change has been identified as a top priority for NIH-wide research efforts, and this initiative is focused on developing new and innovative approaches to enhance health-related behavior change.

In 2009, NIH launched the Basic Behavioral and Social Science Opportunity Network (OppNet), a trans-NIH initiative to expand the agency's funding of basic behavioral and social sciences research (b-BSSR). Basic-BSSR studies mechanisms and processes that influence behavior at the individual, group, community and

population level. Research results lead to new approaches for reducing risky behaviors and improving the adoption of healthy practices. All NIH Institutes and Centers (ICs) share the mission of supporting b-BSSR. Representatives for NINR are involved in the OppNet Steering Committee, the Executive and Coordinating Committees, and other working groups and initiatives. OppNet has developed a plan for focused multi-year programs across ICs to advance priority b-BSSR topics, such as the impact of culture on health and well-being and multisensory processing.

NINR is also a member of two NIH Common Fund working groups: Health Economics and the Health Care Systems Collaboratory. The Health Economics Working Group, which was established in the wake of health care reform to support research on specific features of the structure or organization of health care delivery organizations and reimbursement systems to better understand how health care technologies are adopted and combined by health care providers, how they are applied or used for specific patients, and how those features could be modified to enhance efficiency. The goal of the Health Care Systems Collaboratory Working Group is to strengthen the national capacity to implement cost-effective large-scale research studies that engage health care delivery organizations as research partners. The aim of the program is to provide a framework of implementation methods and best practices that will enable the participation of many health care systems in clinical research.

For more information about NINR, nursing science, and research training opportunities, please visit the NINR website at: www.ninr.nih.gov.

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National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Recent Photos from the National Institute of Nursing Research (NINR)

2012 PHOTOS

NINR Director Dr. Patricia A. Grady (l) presents the 2012 NINR Director's Lectureship Award to Dr. Elaine Larsen, Associate Dean for Research and Professor of Pharmaceutical and Therapeutic Research at the Columbia University School of Nursing and Professor of Epidemiology, Columbia University Mailman School of Public Health, for delivering the 2nd Annual NINR Director's Lecture. The title of her presentation was "Infection Prevention: An Interdisciplinary Team Approach."
lo-res | hi-res

NINR Division of Intramural Research "alumna" Jessica Gill, PhD, CRPNP, returned to NINR in 2012 as one of the first Lasker Clinical Research Scholars. The new Lasker Clinical Research Scholars Program, a joint initiative of the National Institutes of Health and the Albert and Mary Lasker Foundation, is the premier clinical intramural research training program at NIH.
lo-res | hi-res

2011 PHOTOS

NINR Director Dr. Patricia A. Grady (4th from l) with "The Ethics of Science at the End of Life: A Town Hall Discussion" panelists (from l) Dr. Joseph Fins, Dr. Nancy Berlinger, Dr. Karla FC Holloway, Susan Dentzer, and Dr. Marie Hilliard.
lo-res | hi-res

Panelists at the NINR 25th Anniversary Concluding Symposium include (from l) Dr. J. Randall Curtis, Dr. Kathleen Dracup, Dr. Martha Curley, Dr. Marjana Tomic-Canic and Dr. Sandra Dunbar.
lo-res

Dr. Rita Colwell, distinguished university professor at the University of Maryland and Johns Hopkins University Bloomberg School of Public Health, emcees NINR's 25th Anniversary Concluding Symposium.
lo-res

2010 PHOTOS

NINR director Dr. Patricia A. Grady (l) with NIH Director Dr. Francis Collins (c) at the May 2010 meeting of the National Advisory Council for Nursing Research. (Michael Spencer, photographer)
lo-res | hi-res

NINR Director Dr. Patricia A. Grady (c) with the graduating class of the 2010 NINR Summer Genetics Institute. (Charles Rose, photographer)
lo-res | hi-res

NINR Director Dr. Patricia A. Grady (r), with former NINR Director Dr. Ada Sue Hinshaw (c), and NINR Deputy Director Dr. Mary E. Kerr (l), at the unveiling of Dr. Hinshaw's portrait during the NINR 25th Anniversary Kickoff Science Symposium. (September 2010).(Michael Spencer, photographer)
lo-res | hi-res

2009 PHOTOS

The graduating class of the 2009 NINR Summer Genetics Institute, July 2009
lo-res | hi-res

NINR Director Dr. Patricia A. Grady, speaking at the Oklahoma Statewide Nursing Research Day conference, April 2009. (Photo supplied by: Beverly Bowers, PhD, RN, CNS, University of Oklahoma, College of Nursing)
lo-res | hi-res

NINR director Dr. Patricia A. Grady addresses the NIH Partners in Research investigator workshop, October 2009. Dr. Howard K. Koh, Assistant Secretary for Health in the U.S. Department of Health and Human Services, also spoke at this workshop.
lo-res | hi-res

2008 PHOTOS

NINR Director Dr. Patricia A. Grady receives an honorary doctor of science degree in June 2008 from Dr. John C. LaRosa, president of the State University of New York Downstate Medical Center.
lo-res | hi-res

NINR director Dr. Patricia A. Grady (l) with former First Lady Rosalynn Carter at the Friends of NINR NightinGala, held in October 2008 in Washington, D.C. Hosted by the Friends of the National Institute of Nursing Research, this annual event celebrates nursing science and NINR. (Photo by James Tkatch)
lo-res | hi-res

NINR Deputy Director Dr. Mary Kerr (2nd from r) during an outreach visit to Alaska in October 2008 with members of the NIH Office of Equal Opportunity and Diversity Management and the NIDDK Office of Minority Health Research Coordination. The NIH representatives met with state government and university officials, health care professionals and students, and members of the Alaska Native/American Indian (AN/AI) community to provide information about NIH research and training opportunities and to learn about the health conditions and needs of the AN/AI population.
lo-res

Dr. Anne Ersig (r), NINR's first graduate from its Graduate Partnership Program in Biobehavioral Research, receives her certificate in November 2008 from NINR Deputy Director Dr. Mary Kerr. (Photo by Michael Spencer, NIH)
lo-res | hi-res

2007 PHOTOS

NINR Director Dr. Patricia A. Grady speaks at a science symposium launching a year-long celebration of the Institute's 20th Anniversary. The celebration officially concluded in October 2006.
lo-res | hi-res

NINR Director Dr. Patricia A. Grady (seated, third from right) with the 2007 National Advisory Council for Nursing Research.
lo-res | hi-res

This page last reviewed on May 28, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

NIH...Turning Discovery Into Health®

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

National Library of Medicine

Mission | Important Events | Legislative Chronology | Director | Programs | Photo Gallery

MISSION

The National Library of Medicine (NLM), in Bethesda, Maryland, is a part of the National Institutes of Health, U.S. Department of Health and Human Services (HHS). Since its founding in 1836 as the library of the U.S. Army Surgeon General, NLM has played a pivotal role in translating biomedical research into practice. It is the world's largest biomedical library and the developer of electronic information services that deliver trillions of bytes of data to millions of users every day. Scientists, health professionals, and the public in the United States and around the globe search the Library's online information resources more than 1 billion times each year.

The Library is open to all and has many services and resources—for scientists, health professionals, historians, and the general public. NLM has over 19 million books, journals, manuscripts, audiovisuals, and other forms of medical information on its shelves, making it the largest health-science library in the world.

In today's increasingly digital world, NLM carries out its mission of enabling biomedical research, supporting health care and public health, and promoting healthy behavior by:

- Acquiring, organizing, and preserving the world's scholarly biomedical literature;
- Providing access to biomedical and health information across the country in partnership with the 6,000-member National Network of Libraries of Medicine (NN/LM®);
- Serving as a leading global resource for building, curating and providing sophisticated access to molecular biology and genomic information, including those from the Human Genome Project and NIH Common Fund;
- Creating high-quality information services relevant to toxicology and environmental health, health services research, and public health;
- Conducting research and development on biomedical communications systems, methods, technologies, and networks and information dissemination and utilization among health professionals, patients, and the general public;
- Funding advanced biomedical informatics research and serving as the primary supporter of pre- and post-doctoral research training in biomedical informatics at 18 U.S. universities.

IMPORTANT EVENTS IN NLM HISTORY

1836—Library of the Office of the Surgeon General of the Army (the present National Library of Medicine) established.

1865—John Shaw Billings, M.D., appointed to supervise Surgeon General's Library, which he developed into a national resource of biomedical literature. He served as director until 1895.

1879—First volume of *Index Medicus* published.

1880—First volume of *Index-Catalogue* published.

1922—Library of the Office of the Surgeon General (Army) renamed Army Medical Library.

1952—Army Medical Library renamed Armed Forces Medical Library.

1956—Act of Congress moved Armed Forces Medical Library to U.S. Public Health Service (PHS) and rechristened it the National Library of Medicine (NLM).

1961—New Library building, #38 (at 8600 Rockville Pike, Bethesda, Maryland, on the NIH campus), dedicated.

1964—Medical Literature Analysis and Retrieval System (MEDLARS) became operational at NLM.

1965—Medical Library Assistance Act gave NLM responsibility of helping the nation's medical libraries through a grant program, and created the Regional Medical

Library Network (now the National Network of Libraries of Medicine).

1967—Toxicology Information Program established at NLM in response to recommendations of the President's science advisory committee.

1968—NLM became a component of NIH. The Lister Hill National Center for Biomedical Communications, NLM's research and development component, was created by Congress.

1971—MEDLINE ("MEDLARS Online") was initiated to provide online access to a subset of references in the MEDLARS database.

1972—TOXLINE, an online bibliographic service covering pharmacology and toxicology, became operational.

1980—NLM's Lister Hill National Center for Biomedical Communications building, #38A, was dedicated. The new structure, adjacent to the Library, houses NLM's research and development components.

1986—Grateful Med—PC-based, user-friendly software for accessing MEDLARS—was introduced to the health community.

1988—The National Center for Biotechnology Information (NCBI) was created by Congress as a national resource for molecular biology information.

1993—National Information Center on Health Services Research and Health Care Technology was created by Congress as a national resource for health services research and evidence-based practice guidelines.

1993—NLM's Internet World Wide Web site (www.nlm.nih.gov) appeared.

1994—The Visible Human Male, a large computer dataset of images based on a cadaver, was introduced. The Visible Human Female appeared 1 year later.

1997—Web-based access to NLM's MEDLINE became available free of charge.

1998—MedlinePlus created to provide access to consumer health information.

2000—ClinicalTrials.gov, an online resource designed to give the public easy access to information about research studies, was launched.

2006—*NIH MedlinePlus* magazine launched, to provide Americans with reliable, up-to-date health information in a consumer-friendly format. The Spanish-English version, *Salud*, followed two years later.

2010—Mobile MedlinePlus released. The new service provides authoritative health information for the growing audience of mobile Internet users by optimizing MedlinePlus and MedlinePlus en español for display on mobile devices.

2010—Emergency Access Initiative (EAI) launched. This collection of over 200 biomedical journals and more than 65 reference books was provided free of charge for persons responding to the January earthquake in Haiti. A partnership of the National Network of Libraries of Medicine and members of the Professional & Scholarly Publishing division of the Association of American Publishers and other publishers. The EAI would be activated again later in the year, in response to severe flooding in Pakistan and the cholera outbreak in Haiti.

2010—Vocabulary standards supported or developed by NLM (LOINC, RxNorm, SNOMED CT) included in rule specifying certification criteria for electronic health record systems that Medicare and Medicaid providers must use to be eligible for “meaningful use” incentives included in the American Recovery and Revitalization Act of 2009.

2011—NLM celebrates 175 years of information innovation. View Image.

NLM LEGISLATIVE CHRONOLOGY

August 3, 1956—An amendment to Title III of the Public Health Service Act, the National Library of Medicine Act, placed the Armed Forces Medical Library under the PHS, and renamed it the National Library of Medicine (Public Law 84-941).

October 22, 1965—The Medical Library Assistance Act of 1965 (Public Law 89-291) was signed into law, authorizing NLM's extramural programs of grant assistance to help expand and improve the nation's medical library and health communications resources, technology, and professional staff for service to the health community.

August 3, 1968—Public Law 90-456 authorized the designation of the Lister Hill National Center for Biomedical Communications.

November 4, 1988—Public Law 100-607 authorized the establishment of the National Center for Biotechnology Information at NLM.

June 10, 1993—Public Law 103-43 authorized the establishment of the National Information Center on Health Services Research and Health Care Technology at NLM.

November 21, 1997—The Food and Drug Administration Modernization Act (Public Law 105-115) called for the creation of the centralized, consumer-friendly online listing of clinical trials that would become ClinicalTrials.gov.

BIOGRAPHICAL SKETCH OF NLM DIRECTOR DONALD A.B. LINDBERG, M.D.

Donald A.B. Lindberg, M.D., a scientist who has been a pioneer in applying computer technology to health care since 1960 at the University of Missouri, in 1984 was appointed Director of the National Library of Medicine, the world's largest biomedical library (FY 2009 annual appropriation of $331 million and 731 FTE).

From 1992 to 1995, he served in a concurrent position as founding Director of the National Coordination Office for High Performance Computing and Communications (HPCC) in the Office of Science and Technology Policy, Executive Office of the President. In 1996 he was named by the HHS Secretary to be the Coordinator for the G-7 Global Health Applications Project.

In addition to an eminent career in pathology, Dr. Lindberg has made notable contributions to information and computer activities in medical diagnosis, artificial intelligence, and educational programs. Before his appointment as NLM Director, he was Professor of Information Science and Professor of Pathology at the University of Missouri-Columbia. He has current academic appointments as Clinical Professor of Pathology at the University of Virginia and Adjunct Professor of Pathology at the University of Maryland School of Medicine.

Dr. Lindberg was elected the first President of the American Medical Informatics Association (AMIA). As the country's senior statesman for medicine and computers, he has been called upon to serve on many boards including the Computer Science and Engineering Board of the National Academy of Sciences, the National Board of Medical Examiners, and the Council of the Institute of Medicine of the National Academy of Sciences.

Dr. Lindberg is the author of 3 books (*The Computer and Medical Care*; *Computers in Life Science Research*; and *The Growth of Medical Information Systems in the United States*), several book chapters, and more than 200 articles and reports. He has served as editor and editorial board member of 9 publications including the *Journal of the American Medical Association*.

Dr. Lindberg graduated Magna cum Laude from Amherst College and received his M.D. from the College of Physicians and Surgeons, Columbia University. Among the honors he has received are Phi Beta Kappa, Simpson Fellow of Amherst College, Markle Scholar in Academic Medicine, Surgeon General's Medallion, recipient of the First AMA Nathan Davis Award for outstanding Member of the Executive Branch in Career Public Service, the Walter C. Alvarez Memorial Award of the American Medical Writers Association, the Presidential Senior Executive Rank Award, Founding Fellow of the American Institute of Medical and Biological Engineering, the Outstanding Service Medal of the Uniformed Services University of the Health Sciences, Federal Computer Week's Federal 100 Award, Computers in Healthcare Pioneer Award, Association of Minority Health Professions Schools Commendation, RCI High Performance Computing Industry Recognition Award, U.S. National Commission on Libraries and Information Science Silver Award, Council of Biology Editors Meritorious Award, HHS Meritorious Service Award, Medical Library Association President's Award, American College of Medical Informatics Morris F. Collen, M.D. Award of Excellence, Johns Hopkins University School of Medicine Ranice W. Crosby Distinguished Achievement Award, New York Academy of Medicine Information Frontier Award, Cosmos Club Award, American Medical Women's Association Lila A. Wallis Women's Health Award, U.S. Medicine Frank Brown Berry Prize, and Fellow of the American Association for the Advancement of Science and the New York Academy of Medicine. He has also received honorary doctorates from Amherst College, the State University of New York at Syracuse, the University of Missouri-Columbia, and the University for Health Sciences, Medical Informatics and Technology, Innsbruck, Austria.

NLM DIRECTORS

Name	In Office from	To
Leon Lloyd Gardner	1945	1946
Joseph Hamilton McNinch	1946	1949
Frank Bradway Rogers	1949	1963
Martin Marc Cummings	1964	1984
Donald A.B. Lindberg	1984	Present

MAJOR DIVISIONS

Division of Extramural Programs

http://www.nlm.nih.gov/ep/

The Extramural Programs (EP) Division provides grants to organizations and individuals for applying computers and telecommunications for improving storage, retrieval, access and use of biomedical information.

EP provides research support via grants on a wide range of basic and applied biomedical informatics research topics.

It awards resource grants to support improved dissemination, managements, and use of biomedical information in real settings.

The Extramural Programs Division also offers career development support in the form of early career transition awards, to assist recent Ph.D.s and M.D.s who are establishing their initial research careers in informatics.

To ensure an adequate national pool of informaticians and health information scientists, NLM supports research training in biomedical informatics at 18 educational institutions throughout the U.S. These programs offer graduate education and postdoctoral research experiences in a wide range of areas, including health care informatics, bioinformatics, and computational biology.

Grants are also made to U.S. small businesses that seek to undertake informatics research and development leading to commercialization. Critical research areas include: representation of medical knowledge in computers; organization and retrieval issues for image databases; and enhancement of human intellectual

capacities through virtual reality, dynamic modeling, artificial intelligence, and machine learning.

Division of Library Operations

http://www.nlm.nih.gov/bsd/bsdhome.html

Library Operations traces its roots to 1836 — the founding year of NLM — when the Library of the Office of the Surgeon General of the Army was established in Washington, D.C. Library Operations hosts access to the physical library and to its online counterpart, creating places where users can discover and gain access to the world's medical literature.

- **Largest medical library in the world** with over 19 million books, journals, manuscripts, audiovisuals, and other forms of medical information and within this collection one of the world's largest and most treasured history of medicine collections.
- **MEDLINE**: the world's premier biomedical database, searchable through the PubMed interface.
- **National Network of Libraries of Medicine (NN/LM)**: a network of over 4,000 health and public libraries nationwide, dedicated to advancing the progress of medicine and improving the public health by providing all U.S. health professionals equal access to medical information.
- **MeSH**: a controlled medical vocabulary presented in a hierarchical structure that enhances specified searching within databases.
- **Unified Medical Language Systems (UMLS)** facilitates the development of computer systems that behave as if they "understand" the meaning of the language of biomedicine and health.
- **MedlinePlus:** an authoritative, up-to-date health information resource for patients, families and health care providers. Links to over 900 health topics, a medical encyclopedia, medical dictionary, drug and supplements database and over 165 interactive tutorials.
- **Mobile MedlinePlus**: a non-platform specific version of MedlinePlus that offers a subset of English and Spanish content from the full Web site.
- **MedlinePlus Connect**: allows electronic health record (EHR) system to easily link users to MedlinePlus.
- **DailyMed**: high-quality information about marketed drugs.
- **Preservation**: microfilming began in 1986 in an effort to preserve the collection; currently Library Operations has moved to a program of Digitization
- **Digitization**: Digital Collections at NLM uses a suite of open source and NLM-created software to make available public domain content of NLM's historical resources.
- **Exhibitions**: Library Operations connects its collection to users in a variety of dynamic and imaginative ways. Through on-site and traveling displays, its award-winning Exhibitions Program develops and mounts exhibitions about the history of science and medicine.
- **DOCLINE**: the automated interlibrary loan (ILL) request routing and referral system.
- **National Information Center on Health Services Research and Health Care Technology (NICHSR)**: created by the 1993 NIH Revitalization Act, NICHSR focuses on the collection, storage, analysis, retrieval, and dissemination of information on health services research, clinical practice guidelines, and on health care technology, including the assessment of such technology.

Division of Specialized Information Services (SIS)

http://sis.nlm.nih.gov

SIS creates information resources and services in toxicology, environmental health, chemistry, and HIV/AIDS. Another component of SIS, the Outreach and Special Populations Branch (OSPB), seeks to improve access to quality and accurate health information by underserved and special populations.

SIS's Toxicology and Environmental Health Information Program produces TOXNET®, a collection of toxicology and environmental health databases. TOXNET includes the Hazardous Substances Data Bank (HSDB®), a database of potentially hazardous chemicals, TOXLINE® (containing references to the world's toxicology literature), and ChemIDplus® (a chemical dictionary and structure database).

TOXMAP® is a resource that uses maps of the United States to show the amount and location of certain toxic chemicals released into the environment. WISER® is a system designed to assist first responders in hazardous material incidents. Haz-Map® links jobs and hazardous tasks with occupational diseases and their symptoms.

SIS also produces DIRLINE®, a directory of organizations and other resources in health and biomedicine and Health Hotlines®, a database of health-related organizations operating toll-free telephone services.

Some SIS products help to address the toxicology and environmental health information needs of the general public. One such resource is Tox Town®, an interactive guide to toxic chemicals and environmental health issues in everyday locations. It is a companion to the extensive information in the TOXNET collection of databases. Tox Town also offers some resources in Spanish. The Household Products Database (http://hpd.nlm.nih.gov) is a consumer's guide that provides information on the potential health effects of chemicals contained in more than 7,000 common household products used inside and around the home. This database allows consumers, scientists, and health professionals to investigate ingredients in brand-name products.

SIS coordinates many of NLM's HIV/AIDS information activities and its Web site provides access to a comprehensive list of resources within and outside of NLM. SIS collaborates with other agencies to produce AIDSinfo, the primary Department of Health and Human Services Web site for federally approved treatment guidelines, clinical trials, drug, and vaccine information.

The Outreach and Special Populations Branch manages and develops programs in an effort to eliminate disparities in accessing health information by providing community outreach support, training of health professionals to use NLM's health information databases, and designing special population Web sites that address specific concerns in various racial and ethnic groups. SIS is also taking the lead in NLM's disaster preparedness efforts, through its Disaster Information Management

Research Center. DIMRC was created to aid the nation's disaster management efforts and is tasked with the effective collection, organization, and dissemination of health information for natural, accidental, or deliberate disasters.

Lister Hill National Center for Biomedical Communications

http://www.lhncbc.nlm.nih.gov/

The Lister Hill Center performs research in developing Next Generation electronic health records to facilitate patient-centered care and advancing clinical decision support systems. It conducts and supports research in natural language processing to extract usable and meaningful information from biomedical text. It also performs extensive research and development in the capture, storage, processing, retrieval, transmission, and display of biomedical documents and medical imagery. Areas of active investigation include image compression, image enhancement, image recognition and understanding, image transmission, and user interface design. LHC conducts extensive research in developing advanced computer technologies to facilitate the access, storage, and retrieval of biomedical information. In addition, it performs extensive research in developing and advancing infrastructure capabilities such as high-speed networks, nomadic computing, network management, and improving the quality of service, security, and data privacy. This research center also performs extensive research and development in the capture, storage, processing, retrieval, transmission, and display of multimedia biomedical data. Multimedia products include high quality-video, audio, imaging, and graphics materials.

National Center for Biotechnology Information (NCBI)

http://www.ncbi.nlm.nih.gov

NCBI conducts research on fundamental biomedical problems at the molecular level using mathematical and computational methods.

It maintains collaborations with several NIH Institutes, academia, industry, and other governmental agencies.

NCBI also fosters scientific communication by sponsoring meetings, workshops, and lecture series. In addition, it supports training on basic and applied research in computational biology for postdoctoral fellows through the NIH Intramural Research Program.

NCBI engages members of the international scientific community in informatics research and training through the Scientific Visitors Program.

It develops, distributes, supports, and coordinates access to a variety of databases and software for the scientific and medical communities. Finally, NCBI develops and promotes standards for databases, data deposition and exchange, and biological nomenclature.

Office of Computer & Communications Systems (OCCS)

http://www.nlm.nih.gov/occs/occs.html

OCCS provides efficient, cost-effective computing and networking services, technical advice, and collaboration in informational sciences in support of the research and management programs offered through NLM.

OCCS develops and provides the NLM backbone computer networking facilities, and supports, guides, and assists other NLM components in local area networking. The Division provides professional programming services and computational and data processing facilities to meet NLM program needs; operates and maintains the NLM Computer Center; designs and develops software; and provides extensive customer support, training courses and seminars, and documentation for computer and network users.

OCCS helps to coordinate, integrate, and standardize the vast array of computer services available throughout all of the organizations comprising NLM. The Division also serves as a technological resource for other parts of the NLM and for other Federal organizations with biomedical, statistical, and administrative computing needs.

The Division promotes the application of High Performance Computing and Communication to biomedical problems, including image processing.

The OCCS staff develops computer-based systems for information retrieval applications, conducts computer science and engineering research and development, and consults and collaborates in the area of advanced electronic office automation facilities. They support software systems to perform these services, and conduct research and evaluations for best fit solutions to information access needs.

U.S. Department of Health & Human Services

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Recent Photos from the National Library of Medicine (NLM)

2012 PHOTOS

This healing totem, created by master carver Jewell James of the Lummi Nation, Washington state, is ensconced in the NLM herb garden after a 4,400-mail cross-country journey. Along its long route, it was blessed by several Native American tribes. The totem is but one unique item in NLM's exhibition, Native Voices: Native Peoples' Concepts of Health and Illness, which is on display at NLM through 2013 and will also travel nationally. (www.nlm.nih.gov/nativevoices)

lo-res | hi-res

In March 2012, NLM and its partners in the Bethesda Hospitals' Emergency Preparedness Partnership (BHEPP) won a coveted HHSinnovates award for developing a tool to help hospitals handle the surge of patients during a disaster. The portable, electronic system provides real-time information on the number of incoming patients, the severity of their injuries, and their location within the hospital so key personnel can quickly make strategic decisions about patient care and safely share patient information when victims are moved from one hospital to another. US Health and Human Services Secretary Kathleen Sebelius named The Patient Tracking and Locating System a "Secretary's Pick." The system was developed and tested during disaster drills by NLM and the three nearby hospitals that form the public-private BHEPP: the National Institutes of Health (NIH) Clinical Center, which like NLM is part of the National Institutes of Health; the Walter Reed National Military Medical Center, also part of the federal government; and Suburban Hospital Johns Hopkins Medicine, a community-based hospital in Bethesda.

lo-res | hi-res

2011 PHOTOS

The National Library of Medicine marked its 175th anniversary year in a big way with this unique group photograph. As part of the celebration, hundreds of workers formed the number 175 and posed for a commemorative photo on the Library's front steps. Assembling the staff and creating the photo was a feat that involved logistics, art, aerial bravery and the ability to stand still for 10 minutes on a cold December day, but the result was clearly worth it. (Photo by JessicaMarcotte.com.)

lo-res| hi-res

2010 PHOTOS

NLM MedlinePlus.gov

NLM's popular consumer Web site, MedlinePlus (www.medlineplus.gov) undertook a complete (and well-received) makeover of its site, in English and en español, in 2010.

lo-res

NLM Mobile MedlinePlus

MedlinePlus also launched a mobile version, http://m.medlineplus.gov/, to provide users with on-the-go access to many resources located on the Web site.

lo-res | hi-res

NLM Data Standards

Key elements in the implementation of electronic health records nationwide are standardization of medical terminology and interoperability of those records. NLM has a long and distinguished history in this area and continues to work closely with policymakers at HHS and the White House, and to conduct its own research.

lo-res | hi-res

NLM Disaster Information Management Resource Center

Resources were added this year to the DIMRC site, to aid those coping with earthquakes in Chile and Haiti, and the Gulf oil spill. This year, NLM also activated the Emergency Access Initiative, to provide free reference materials to Haiti and Pakistan.

lo-res | hi-res

NLM medlineplus4you
In 2010, social media really took off at NLM. NLM has more Twitter feeds and Facebook accounts than any other NIH Institute or Center, and we're employing those to spread the word about NLM's many programs and services to our audiences all over the world.
lo-res | hi-res

2009 PHOTOS

BHEPP Disaster Drill
On October 15, 2009, NLM participated in a disaster drill in Bethesda, MD. Joining forces were the other members of the Bethesda Hospitals Emergency Preparedness Partnership (BHEPP)—the NIH Clinical Center, the National Naval Medical Center, and Suburban Hospital, Johns Hopkins Medical. This unique alliance pulls together public, private, and military facilities, creating a model that could be replicated around the country and also serving as a laboratory for the development of cutting-edge disaster-related technologies. NLM's effort is coordinated by the Disaster Information Management Research Center (DIMRC) office at the Division of Specialized Information Service (SIS).
lo-res

NCBI's 20th Anniversary
The National Center for Biotechnology Information (NCBI), a component of NLM, celebrated its 20th anniversary with a program February 5, 2009 in Natcher Conference Center. NCBI is a national and international resource for molecular biology information. It creates public databases, conducts research in computational biology, develops software tools for analyzing genome data, and disseminates biomedical information—all for the better understanding of molecular processes affecting human health and disease.

NLM Director Dr. Donald A.B. Lindberg, who helped lead the charge for the creation of NCBI in the mid-1980s, gave an overview of the planning process. Here, he is showing an image of Congressman Claude Pepper (D-FL), whose House Select Committee on Aging Subcommittee on Health and Long-Term Care held hearings on the need for a national biotechnology information center. On the left is Aging Committee member Cong. Lindy Boggs (D-LA), while Frances Humphrey Howard, an NLM employee who was also a driving force in NCBI's creation, is on the right. She was the sister of U.S. Vice President Hubert H. Humphrey.
lo-res | hi-res

Powwows
Begun as an effort by the Office of the NIH Director and the NIH Office of Equal Opportunity (OEO) office in 2001, the NIH Native American Powwow Initiative has brought together several NIH offices during its history. It is now under the auspices of NLM. Participating in the powwows allows NLM to build and nurture relationship with Native American communities on the east coast and in other areas of the US. Specifically, these gatherings afford excellent opportunities for NLM staff to share health information (online and in print), while informing Native Americans about NIH as a biomedical resource. These festive gatherings allows staff to engage Native Americans in conversation, learning about their specific health concerns and also learning more about their customs.

This colorful scene is from the Mashpee-Wampanoag powwow, Cape Cod, Massachusetts, 4th of July weekend, 2009.
lo-res | hi-res

NIH Medline*Plus Magazine*
In 2009, NLM celebrated its third year of producing the *NIH Medline*Plus quarterly magazine, an outreach effort made possible support from NIH and the non-profit Friends of the NLM. The free magazine contains no advertising and is widely distributed to the public via physician offices, libraries, and other locations, with a readership of up to 5 million nationwide. Each magazine focuses on the latest research results, clinical trials, and new or updated guidelines from the various NIH institutes A Spanish/English version, *NIH Medline*Plus *Salud* (Spanish for "health"), was launched in January 2009 with support from the National Alliance for Hispanic Health to address the specific health needs of the growing Hispanic population and to showcase the many Hispanic outreach efforts and NIH-funded research results.
lo-res | hi-res

This page last reviewed on April 9, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

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U.S. Department of Health & Human Services

National Institutes of Health
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Center for Information Technology

Mission | Important Events | Director | Programs

MISSION

The Center for Information Technology's (CIT) mission is to provide, coordinate, and manage information technology and to advance computational science.

CIT supports NIH's research and management programs with efficient, cost-effective administrative and high-powered scientific computing, software development, networking, and telecommunications services. CIT also provides bioinformatics support through its scientists, engineers, and mathematicians. Among its activities, the CIT:

- engages in collaborative research and provides collaborative support to NIH investigators in the area of computational bioscience
- provides efficient, cost-effective information systems and networking services
- provides state-of-the-art scientific and administrative computing facilities
- identifies new computing technologies with innovative applications to biomedical research
- creates, purchases, and distributes software applications
- provides NIH staff with computing information, expertise, and training
- provides data-processing and high-performance computing facilities, integrated telecommunications data networks, and services to the U.S. Department of Health and Human Service (HHS) and other Federal agencies
- serves as a data center to HHS and other Federal agencies
- develops, administers, and manages NIH systems and provides consulting services to NIH Institutes and Centers in support of administrative and business applications

IMPORTANT EVENTS IN CIT HISTORY

1954—A central data-processing facility is established in the NIH Office of the Director under Dr. Harold Dorn, combining EAM (punched card) equipment and biometric expertise.

1956—The biometric facility becomes the Biometrics Branch in the new Division of Research Services (DRS).

May 1956—The NIH Director establishes a committee on electronic data processing and computers.

1958—NIH installs its first electronic digital computer as an experimental device.

March 1960—The U.S. Surgeon General approves the establishment of a Computation and Data Processing Branch in DRS.

October 1961—NIH installs its first "second generation" computer.

April 1963—The NIH Director appoints a steering committee to undertake a comprehensive study of data-processing activities at NIH.

The NIH steering committee recommends the establishment of a Division of Computer and Information Sciences, subsequently changed to the Division of Computer Research and Technology (DCRT), including provision for the transfer of the Computation and Data Processing Branch, DRS, to the new organization.

1964—DCRT is established, with James King as Interim Acting Director.

1966—Dr. Arnold W. Pratt is named DCRT's first Director.

April 1966—Components of the "third-generation" computer system are installed.

April 1969—NIH research community receives the first time-sharing computers.

June 1969—Minicomputers designed by DCRT are installed in NIH laboratories.

August 1969—DCRT introduces WYLBUR, an innovative software that eliminates the need for punch cards and provides new computing capabilities to the administrative and scientific communities.

September 1969—Drs. Arnold W. Pratt and Milos G. Pacak present *Automated Processing of Medical English* at the International Conference on Computational Linguistics in Stockholm, Sweden. Their paper describes DCRT's development of a system for automated processing of Medical English using the Systematized Nomenclature of Pathology (SNOP), a special purpose lexicon created by pathologists to assist in the organization and retrieval of information. SNOP was originally designed by Dr. Arnold Pratt to describe pathological specimens according to their morphology and anatomy (topography).

May 1979—An interagency agreement between the U.S. Department of Health, Education and Welfare and the General Services Administration establishes the NIH Central Computer Utility as a Federal Data Processing Center.

1981—DCRT designs and implements NIH Extended WYLBUR, providing text-editing capabilities used for NIH publications, grants guidance and summary statements, and research papers.

April 1983—The Personal Workstation Project is founded to determine how effectively NIH personnel can use personal computers.

February 1984—NIH opens the Personal Computer User Resource Center (URC). The URC, a joint effort between the DCRT, Division of Personnel Management, and the Division of Management Policy, serves as an NIH resource for obtaining assistance with personal computer usage and houses the first hands-on personal computer training facility at NIH.

1988—The Convex Unix-based supermini-computer is installed, and the network task group is created.

1990—Extensive networking (NIHnet) is installed at NIH, providing connectivity for 60 local area networks.

March 1992—HHS Secretary Lewis Sullivan, in a letter to Congress, commits to creating a new office to improve management and coordination of NIH's information resources.

June 1992—The NIH Director approves creation of the Office of Information Resources Management (OIRM) in the NIH Office of the Director.

Dr. Francis W. Hartel is selected as the NIH Senior IRM official and the Director of OIRM.

September 1993—The Information Systems Security Officers committee is established to handle NIH IT security issues.

January 1994—DCRT celebrates its 30th anniversary.

February 1994—DCRT establishes the Technical Assistance and Support Center (TASC) to help customers obtain computer-related information and support.

October 1994—OIRM sponsors the first NIH Internet conference on legal and policy issues related to the increased use of Internet resources.

May 1995—DCRT sponsors Internet Expo Day to help NIH staff discover the World Wide Web and its enormous potential to disseminate and exchange information.

June 1995—The NIH Director approves a revised charter for the IRM Council and increases its role in providing management leadership on NIH-wide information technology (IT) initiatives.

July 1995—OIRM, the National Science Foundation, and the World Wide Web Federal Consortium sponsor a Federal Webmaster workshop on legal, ethical, and security issues related to increased Web use by Federal agencies.

August 1995—The first NIH electronic store is established to provide efficient acquisition of personal computers, hardware, software, and online components to NIH personnel.

1996—A telecommunications committee is established to provide the IRM Council with advice about crosscutting telecommunication issues affecting a large number of NIH staff. Issues include telephone features and services, pagers, cellular services, video teleconferencing, remote access, audio conferencing, and switchboard operator services.

Responsibilities are shared by DCRT and the Telecommunications Branch located in NIH's Office of Research Services.

DCRT introduces a subscription-based program for the acquisition and distribution of brand-name software to NIH and HHS personnel, with the result of significant cost reduction for software licensing.

The NIH Director names Anthony Itteilag, the NIH Deputy Director for Management, to serve as interim NIH CIO.

Dona R. Lenkin is appointed to serve as OIRM Acting Director and alternate NIH CIO.

May 1996—The IRM Council establishes the NIH Year 2000 Work Group (Y2K) to provide NIH with leadership and direction on initiatives modifying computer systems and applications to accommodate problems related to a 2-digit date field.

June 1996—NIH's Computer Center is designated as a major HHS data center.

July 1996—The NIH Data Warehouse, which provides a one-stop-shop graphical user interface to NIH administrative and accounting information, is introduced to NIH.

August 1996—The Information Technology Management Reform Act of 1996 (ITMRA, also known as the Clinger-Cohen Act) becomes effective. ITMRA assigns overall responsibility for the acquisition and management of government IT resources to the Director, Office of Management and Budget. Additionally, ITMRA gives authority to heads of executive agencies to acquire IT resources and directs agencies to appoint a Chief Information Officer (CIO) to provide advice to each agency on the effective management of IT investments.

September 1996—The NIH Director's leadership forum on the management of IT at NIH forms an IT Central Committee (ITCC) to provide recommendations on improving the management of NIH IT resources.

December 1996—A final ITCC report is submitted to the NIH Director. The report recommends appointing a CIO and combining DCRT, OIRM, and the Telecommunications Branch into a single organizational structure.

1997—A review of NIH's administrative structure, conducted in response to a request from Congressman John Porter (Ill.), is completed. The report recommends that the NIH implement the ITCC recommendations by appointing a permanent CIO and establishing a CIO organization.

NIH's first electronic magazine, *LiveWire*, is launched by DCRT. The online magazine offers easy access to key services and computer information.

February 1997—CIT completes development of the predecessor to the TELESYNERGY® Medical Consultation WorkStation, a multimedia, medical imaging workstation. This system provides an electronic imaging environment, utilizing a prototype Asynchronous Transfer Mode (ATM) telemedicine network. The TELESYNERGY® environment includes a scientific workstation as the computing platform that transmits simultaneous high-resolution images to all sites participating in a medical consultation.

July 1997—DCRT introduces the NIH Human Resources Information and Benefits System, a Web service that gives employees easy access to personnel data, including benefits, salary, awards, leave, savings, performance, and retirement.

September 1997—DCRT completes consolidation of 2 HHS data centers—the Program Support Center Information Technology Service and the Administration for Children and Families National Computer Center—into the NIH Computer Center.

October 1997—Vice President Albert Gore awards OIRM staff the National Performance Review "Hammer" Award for the development of an automated security risk assessment tool for networks.

November 1997—DCRT inaugurates SILK (Secure Internet-Linked) technology to provide Web access to enterprise data.

February 1998—The Center for Information Technology (CIT) is formed, combining the functions of the DCRT, OIRM, and the Telecommunications Branch.

March 1998—Alan S. Graeff is named NIH's first CIO and Director of the newly formed CIT.

April 1998—CIT's OIRM sponsors an IT security conference to provide IT security officers and others with essential information for moving toward the 21st century.

CIT renames its original acquisition and distribution project to the Software Distribution Project (SDP). The SDP provides software to more than 24,000 customers, including more than 80% of all NIH personnel.

October 1998—The NIH IT Board of Governors is established to advise the NIH and the NIH CIO on NIH-wide IT management and to make recommendations on IT activities and priorities.

May 1999—The Information Technology Management Committee (ITMC) is formed to develop and communicate recommendations and decisions at the NIH Institute and Center level, provide a forum for building consensus across the NIH, and serve as an umbrella organization to the NIH IT process management and technical committees.

December 1999—NIH successfully prepares for the Year 2000, thus bringing to fruition 4 years of effort preparing for the largest information management project in history. The NIH strategy of aggressive renovation and validation of information systems, biomedical equipment, facilities, utilities, and telecommunications provides a smooth transition that ensures the integrity of the NIH mission.

2000—CIT renames the Software Distribution Project (SDP) to the Information Systems Designated Procurement (iSDP) to acquire and deliver brand-name software, hardware, and services to NIH and HHS personnel. The iSDP takes advantage of large-volume purchasing agreements to provide significantly discounted prices to its customers. The iSDP also saves its participants time and money by eliminating the need to search for the best information systems deals. iSDP provides major software titles, hardware, and services to more than 54,000 customers, including 84% of HHS personnel and all of NIH.

January 2000—CIT joins forces with the National Cancer Institute (NCI) in a pioneering TELESYNERGY® collaboration to reach out to distant community hospitals. Patients in remote areas are now able to participate in selected NCI phase I and phase II protocols. Collaborating sites, with TELESYNERGY® Systems either installed or under construction, include hospitals in Fort Lauderdale, Florida; Wheeling, West Virginia; Belfast, Northern Ireland, United Kingdom; and Dublin, the Republic of Ireland.

2001—The NIH Incident Response Team is the first civilian Federal agency to receive the prestigious Office of Personnel Management Guardian Award for exceptional contributions in ensuring the confidentiality, availability, and integrity of NIH information resources.

2002—Dr. John F. (Jack) Jones, Jr., joins CIT as Chief IT Architect for NIH, to focus on NIH enterprise systems critical to the mission of NIH and lead Enterprise Architecture.

CIT takes a leadership role in forging NIH's strategy for common services, including hosting the improved and expanded NIH Portal.

CIT supports the development and staged implementation of the NIH Portal as a single, user-friendly customizable Web interface by which data and documents can be readily accessed by NIH staff and associated personnel.

CIT successfully implements the NIH Administrative Restructuring Advisory Committee (ARAC) recommendations for IT Consolidation (Phase I).

2003—The NIH Information Technology Working Group (ITWG), established by the NIH Director as part of the NIH Steering Committee, provides governance and oversight on NIH IT management issues. As an advisory group to the NIH Director, NIH Steering Committee, and NIH CIO on IT management, the ITWG establishes governance over the 5 IT Domain Areas below, representing the areas where decisions need to be made at the intersection of business and information technology.

- IT Principles Domain—includes alignment of IT to the NIH mission, corporate policies, and oversight of the use of IT, and determination of ownership of IT initiatives
- IT Infrastructure Strategies Domain—includes the IT "public utility" and secure, robust, and manageable common services
- IT Architecture Domain—includes data standards and application standards
- Business Application Needs Domain—includes all enterprise, non-scientific administrative, grants/extramural, and Intramural IT systems
- IT Investment and Prioritization Domain—includes funding mechanisms and priorities

The CIT help desk is formally established as the NIH IT Help Desk.

2004—CIT successfully implements the NIH ARAC recommendations for IT Consolidation Phase II; CIT continues to implement and oversee NIH enterprise-wide applications like:

- Integrated Time and Attendance System (ITAS)
- NIH Enterprise Common Services (NECS), including NIH Login and NIH Portal
- NIH Intramural Data Base (NIDB)
- Contractor Performance System (CPS)
- Vulnerability Tracking System (VTS)
- Human Resources Data Base (HRDB)

2005—Dr. Jones assembles domain teams from across NIH to examine the technology and standards needs of areas that are about to undergo significant consolidation, such as e-mail systems and wireless networks.

2006—Al Whitley is named Deputy Director of CIT.

CIT becomes the technical owner of the NIH Enterprise Ethics System (NEES), the comprehensive automation of the NIH Ethics Program. NEES provides the means to submit, review, track, and report on all ethics-related reports and requests along with supporting documentation. Because of the size and complexity of the overall system, the product is delivered in phases. The first release of NEES is implemented in FY 2006 and focuses on the Public Financial Disclosure Report, referred to as the SF-278.

2007—CIT implements NIH NEES Release 1.5, which enables all remaining functions required for the review and certification of the SF-278 Public Financial Disclosure Report.

CIT designs a new system for the helix.nih.gov general purpose scientific platform that hosts applications in response to technology needs of the NIH research community. This includes introducing 1024 new processors for the Biowulf cluster and completing plans to upgrade the Helix shared memory system. Forty-eight additional nodes are integrated into the Infiniband network of the Biowulf cluster, thus reducing queue times for the most demanding parallel molecular dynamics applications. In addition, new hardware to replace helix.nih.gov is delivered and applications are installed, configured, and tested.

CIT accomplishes the closure of a multi-year project to federate with the HHS's consolidated and outsourced email system. As part of this Federation task (which is a requirement on the Performance Management Appraisal Program of the NIH Director and NIH CIO for 2007), the NIH successfully provides for a synchronized email directory service, a synchronized calendar service, email vaulting services, email disaster recovery services, and the doubling of the default mailbox size at the NIH from 100 to 200 MB.

CIT establishes a framework and develops policies, procedures, and templates for the multiple phases of a process improvement software development life cycle and 2 phases on the software management life cycle. During the fiscal year, a suite of project management practices is established. Processes, tools, and artifacts align the DECA PM Methodology with the HHS Enterprise Performance Life Cycle (EPLC) Framework. Quality Assurance (QA) and Configuration Management (CM) functions are established.

In April 2007, the NIH Data Town interface is retired and a new nVision interface is implemented to create a single, central Web site—the nVision Data Warehouse Portal. Data Warehouse business areas and reporting tools, such as Budget and Finance, Human Resources, Research Contracts and Grants, Staff Training and Development, Budget Tracking, Manager's Desktop Assistant, and Workforce Planning Trends that were previously housed on Data Town are co-located with the

nVision business areas to form the new nVision Data Warehouse portal page.

January 2008—On January 7, 2008, the Office of the Chief Information Officer (OCIO) is established, transferring the functions of the Chief Information Officer (CIO), formerly part of CIT, to the NIH Office of the Director. The NIH CIO advises the NIH Director on the strategic direction and management of significant NIH IT program and policy activities.

February 2008—CIT celebrates its 10th anniversary.

June 2008—CIT deploys the NIH Federated Authentication Identity Service (NIH Federated Login). This service facilitates access by NIH and non-NIH collaborators to specific, publicly available NIH research applications, databases, and scientific information. To log in to these resources, authorized collaborators from Government agencies, national laboratories, universities, hospitals, and pharmaceutical and biotechnology medical research centers can use the same user name, password, or other personal identification from their home agency, institution, or organization. By providing an easy-to-use login, online information and web-based resources can be shared to promote collaboration for enhanced worldwide research in support of scientific and medical research.

August 2008—CIT announces the first online Service Catalog, providing customers with a single, online authoritative source of service information. The new catalog combines the wide range of CIT services into customer friendly categories, making information easier to find. The catalog lists 120 services in such areas as telecommunications, application development, computer systems, and customer support. Key catalog components include service description, customer benefits, hours of operation, contact information, customer market, and related links. The catalog design focuses on Information Technology Infrastructure Library (ITIL), an internationally recognized set of best practices for IT Service Management, and was developed in recognition of the growing dependency on IT to satisfy business needs.

September 2008—CIT Training marks 40 years of computer training to the NIH community. In the fall of 1968, DCRT began offering courses to assist NIH programmers, analysts, and managers to make more effective use of computers and software. A total of 18 courses were offered, with 261 course completions. CIT Training now offers more than 220 courses with seminars designed for those interested in scientific applications, web development, networking, computer security, statistics, grants, and personal computing. Over 10,000 course completions are recorded in FY 2008.

October 2008—CIT participates in the NIH Research Festival, presenting several collaborative initiatives, including the following:

- CIT joins forces with the National Institute of Dental and Craniofacial Research (NIDCR) to develop the Salivary Proteome Wiki as a resource for the proteomic research community. The system is one of the first in NIH to facilitate scientific collaboration and knowledge management using Web 2.0 technologies. It allows researchers to discuss ideas, perform annotation and curation, share experimental results, and discover new knowledge in a community-driven paradigm.
- In collaboration with the Molecular Libraries Program Center Network (MLPCN), CIT successfully delivers the Common Assay Reporting System (CARS), which allows center investigators and program directors to track the status of bioassay projects and related issues at each screening center within the MLPCN. The system also provides a means for collecting, sharing, and retrieving bioassay information among the screen centers and program office at NIH.

February 2009—CIT hosts a symposium highlighting recent research using the computational resources of the NIH Biowulf Cluster, one of the larger general-purpose biomedical computing clusters in the world.

February 2009—The NIH Federated Identity Service, which provides authorized collaborators worldwide with secure, single sign-on access to NIH information, is honored with the Government Information Technology Executive Council's (GITEC) 2009 Project Management Excellence Award.

September 2009—CIT is selected as a 2009 *InformationWeek* Government IT Innovator in recognition of the NIH Federated Identity Service.

December 2009—The NIH IT Help Desk is transitioned to the NIH IT Service Desk, implementing enhancements to deliver more robust support to users and partners.

December 2009—CIT and the NIH Office of the CIO co-sponsor the first iTrust forum, "Identity and Trust: Enabling Collaboration in a Connected World," to focus on the effects of Open Identity and Personal Identity Verification (PIV) card technology and to examine Federal-wide efforts to foster identity management collaboration.

December 2009—NIH retires WYLBUR, the Titan editing and batch processing system, as many of its text editing functions are now performed with desktop computer tools.

February 2010—CIT deploys the website for First Lady Michelle Obama's Let's Move! campaign to combat the epidemic of childhood obesity. This website provides schools, families, and communities tools to help children become healthier through increased activity and better nutrition.

April 2010—CIT collaborates with the National Institute of Mental Health (NIMH) on the design of prospective PET imaging probes radiolabeled with fluorine-18.

June 2010—CIT collaborates with the National Institute of Mental Health (NIMH), Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), National Institute of Neurological Disorders and Stroke (NINDS), and the National Institute of Environmental Health Sciences (NIEHS) with the development of the National Database for Autism Research (NDAR) system. NDAR expands to help accelerate progress in autism research by creating a secure, web-enabled infrastructure that integrates heterogeneous datasets, providing unprecedented access to a high volume of research data relevant to autism.

June 2010—CIT adds compute nodes to the NIH Biowulf Cluster, greatly increasing compute power for a wide range of biomedical research applications, including those in genomics, imaging, molecular dynamics, and statistical analysis. At nearly 9000 processing cores, the NIH Biowulf Cluster is the largest single compute resource at the NIH, helping meet the ever increasing demand for biomedical research computing.

June 2010—CIT develops the Content Management System for, and directs the launch of, the Public Health Emergency website for the Department of Health and

Human Services (HHS) Assistant Secretary for Preparedness and Response.

June 2010—CIT collaborates with the National Heart, Lung, and Blood Institute (NHLBI) to develop a system for quality control monitoring, data collection, and statistical analysis of gene expression data for thousands of samples from the Framingham Heart Study.

August 2010—CIT adds zLinux Virtual Server Hosting Service, offering Department of Health and Human Services (HHS) customers open source applications hosting, including dynamic web publishing tools and collaborative tools such as wikis. Virtualization also results in significant cost savings by promoting energy conservation and space optimization.

August 2010—CIT hosts server and web collaboration services for the Department of Health and Human Services (HHS) in support of the Health Care Reform tracking project. Users access the applications using single sign-on authentication.

October 2010—CIT deploys a data repository and website developed for Science and Technology for America's Reinvestment: Measuring the Effect of Research on Innovation, Competitiveness and Science, or STAR METRICS, a multi-agency venture led by the NIH, National Science Foundation (NSF), and White House Office of Science and Technology Policy (OSTP). STAR METRICS provides an innovative partnership between science agencies and research institutions to document the value and outcomes of science investments to the public.

November 2010—CIT collaborates with the National Institute of Dental and Craniofacial Research (NIDCR) to develop a wiki-based platform for scientists to explore and enrich a comprehensive catalog of proteins found in human saliva. The service now extends to include researchers from industries and other governmental agencies, such as the Food and Drug Administration (FDA).

October 2011—Andrea T. Norris is named CIT Director and Acting NIH CIO.

August 2012—CIT Director Andrea T. Norris is named NIH CIO.

BIOGRAPHICAL SKETCH OF CIT DIRECTOR ANDREA T. NORRIS

Ms. Andrea T. Norris was appointed the Director, CIT, and Acting Chief Information Officer (CIO), NIH, on October 2, 2011. She was later named NIH CIO. Ms. Norris comes to the NIH from the National Science Foundation (NSF), where she served as the Acting Chief Information Officer and Director of the organization responsible for providing Agency-wide information technology systems, services, and supporting infrastructure. During ten years at NSF, she provided strategic direction and leadership for the technology investments needed to support the Foundation's mission. Among other accomplishments, she established collaborative planning and governance processes to assure core technology investments aligned with Agency priorities and met customer needs, delivered innovative new systems and tools to support research and education activities, modernized core information technology infrastructure and operational processes, and established the Foundation s risk-based security and privacy program. Prior to joining NSF, Ms. Norris was the Deputy Chief Information Officer for Management for the National Aeronautics and Space Administration, providing senior leadership and management of the Agency s complex information technology portfolio.

CIT DIRECTORS

Name	In Office from	To
James King (Acting)	N/A	N/A
Dr. Eugene Harris (Acting)	N/A	August 1966
Dr. Arnold W. Pratt	August 1966	May 1990
Dr. David Rodbard	November 1990	April 1996
William L. Risso (Acting)	April 1996	March 1998
Alan S. Graeff	March 1998	November 2005
Dr. John F. Jones, Jr. (Acting)	November 2005	February 2011
Thomas G. Murphy (Acting)	February 2011	October 2011
Andrea T. Norris	October 2011	Present

PROGRAMS

CIT consists of the Office of the Director (OD), Division of Computational Bioscience (DCB), Division of Computer System Services (DCSS), Division of Customer Support (DCS), Division of Enterprise and Custom Applications (DECA), and Division of Network Systems and Telecommunications (DNST).

Office of the Director (OD)

The Office of the Director plans, directs, coordinates, and evaluates the Center's programs, policies, and procedures and provides analysis and guidance in the development of systems for the effective use of IT techniques and equipment in support of NIH programs.

Division of Computational Bioscience (DCB)

DCB is a research and development organization that provides scientific and technical expertise in computational science and engineering to support biomedical research activities at the NIH, including the following:

- Conducts collaborative research in biomedical instrumentation and rapid prototyping, clinical and laboratory imaging and image management, communication and processing technologies, computational statistics, genomics and proteomics, high-performance computing, high-throughput sequence analysis, human- and animal-based research systems, knowledge-based management systems, mathematical and biophysical modeling, medical and bioinformatics, molecular dynamics of biological macromolecules, molecular modeling, molecular structure determination, portfolio analysis, robotics and process automation, scientific visualization, signal transduction, data acquisition and processing, simulation of complex biological systems, systems biology, and telecollaboration and telehealth systems.
- Develops complex computational methods and tools for solving biomedical, laboratory, and clinical research problems.

Division of Computer System Services (DCSS)

DCSS plans, implements, operates, and supports centrally owned or administered computing resources for NIH enterprises use, ensuring interoperability among those resources and between them and other computing facilities owned by customer organizations. Activities include the following:

- Promotes awareness and efficient and effective use of these computing resources by customer personnel through training, presentations, consultations, and documentation.
- Investigates new and emerging computing requirements of customer programs. It conducts research and development to identify, evaluate, and adapt new computer architectures and technologies to meet identified customer requirements and to enhance current service offerings.
- Manages and operates, where appropriate, departmental computing resources for NIH, Office, or Center use.

Division of Customer Support (DCS)

DCS provides centralized, integrated computer support services to the NIH computing community, including the following:

- Advocates customer needs to CIT management and represents services and policies to CIT's customers.
- Plays an active and participatory role in supporting desktop computing to the end-user in the areas of software and hardware, including internet, communications, and access technologies.
- Coordinates and oversees CIT's Training Program for the benefit of the NIH computing community. The training program is delivered at no charge to the user.
- Provides central account establishment and management services for access to CIT systems, manages the NIH IT Service Desk, and implements problem tracking systems.

Division of Enterprise and Custom Applications (DECA)

DECA supports the NIH enterprise business process through the development and management of transaction and decision-support environments for administrative and business applications of NIH, such as procurement, budget, accounting, and human resource activities, as well as systems that support extramural and intramural business processes. Activities include the following:

- Provides complete information systems management services to the NIH, including technical project management, systems analysis, programming, data integration and conversion, quality assurance, testing, and production support.
- Provides the NIH community with World Wide Web development, support services, and consulting services for applications development.

Division of Network Systems and Telecommunications (DNST)

DNST directs the engineering, design, implementation, and support of network infrastructure and services for the NIH-wide area network (NIHnet) to facilitate the use of scientific, administrative, and other business applications. Activities include the following:

- Manages and directs NIH telecommunications systems and technical requirements for the NIH ICs and implements telecommunications programs to meet the needs of the NIH community.
- Researches, develops, and tests next-generation networking/ telecommunications technologies and develops and supports applications using new network technologies.
- Provides consulting, guidance and support to the ICs, helping them meet their network requirements.
- Improves the information infrastructure on networking/telecommunications activities by serving as liaison to the NIH ICs and other HHS components.
- Serves as a focal point for telecommunications service orders, and develops and disseminates recommended standards, policies, and procedures for the nationwide implementation and management of NIH networking and telecommunications systems.

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U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Center for Scientific Review

Mission | Important Events | Director | Photo Gallery

MISSION

The Center for Scientific Review's (CSR's) key mission is to see that NIH grant applications receive fair, independent, expert, and timely reviews—free from inappropriate influences—so NIH can fund the most promising research.

The Center specifically:

- Serves as the central receipt point for all research and training grant applications submitted to NIH. Also receives some of the applications submitted to other components of the U.S. Department of Health and Human Services (HHS) and refers them to these components;
- Assigns all NIH applications to the appropriate NIH institutes or centers for consideration for funding and also to the scientific review groups within CSR or other institutes or centers for review;
- Provides the scientific merit review of most research grant and fellowship applications submitted to NIH;
- Provides staff support to the Office of the Director, NIH, in the formulation of grant and award policies and procedures; and
- Assists other NIH components in providing information on the NIH peer review system and information about the research grant and fellowship application process and procedures to the scientific community, Congress, other NIH staff, and the general public.

IMPORTANT EVENTS IN CSR HISTORY

1944—Public Health Service (PHS) Act (Public Law 78-410, sec. 301, July 1) authorized the Surgeon General to "make grants-in-aid to universities, hospitals, laboratories, and other public or private institutions, and to individuals for such research projects as are recommended by the National Advisory Health Council, or, with respect to cancer, recommended by the National Advisory Cancer Council." The Act also authorized the award of fellowships in the health sciences.

1946—The Research Grants Office was established January 1 under authority of section 301 of the PHS Act to administer several research projects transferred to PHS at the end of World War II and to operate a program of extramural research grants and fellowship awards. The office was elevated to division status at the end of 1946.

The Division of Research Grants (DRG) was responsible for operating and administering a program of extramural research and training through grants-in-aid of research in the biomedical and health-related sciences. DRG retained the operating responsibility until each successive institute was established and took over the programs in its categorical fields. The National Cancer Institute, which already ran an extramural research program on its own, continued to do so.

DRG was instructed by the National Advisory Health Council to establish study sections for scientific and technical review of research grant applications, and to explore neglected areas of research in the health sciences.

1958—Responsibility for research grant and training programs in noncategorical areas, operated by the division since 1946, was transferred to the new Division of General Medical Sciences (DGMS). DRG then reorganized to concentrate on the review of research grant and fellowship applications, coordination of all extramural programs operated by the institutes and DGMS, and operation of the health research facilities program and grants management.

1961—The Grants Associates Program began recruitment and training of professional staff for the extramural branches of all PHS granting divisions, with DRG serving as a primary training focus.

1962—DRG was assigned overall responsibility for coordinating policies and practices for administration of grants and awards for all PHS extramural programs.

1965—The Civil Rights Liaison Office was established.

1966—DRG assumed additional responsibilities for review with the transfer from the institutes of the committee on scientific publications, the NCI collaborative research panel, the environmental sciences review committee, and the review functions of 6 panels of the U.S.-Japan Cooperative Medical Science program.

1968—DRG expanded the computer-based central data system, information for management planning analysis and coordination (IMPAC), to include the fellowship programs in addition to research, training grant, and research career award programs.

1969—DRG became a part of the Office of the Associate Director for Extramural Research and Training. Grants management responsibilities were transferred to the Office of Financial Management in the Office of the Associate Director for Administration.

1970—DRG coordinated the initial review of all U.S. Food and Drug Administration applications for research grants.

1971—The computer retrieval of information on scientific projects (CRISP) system was designed to provide scientific and associated grant identification information.

1978—The Extramural Associates Program was established under the Intergovernmental Personnel Act (P.L. 91-648) to promote participation of ethnic minorities and women in NIH-supported research.

1983—The Scientific Review Branch, Referral Branch, and Office of Research Manpower were consolidated into the Referral and Review Branch.

DRG became the central information source for the new Small Business Innovative Research (SBIR) Program and coordinated the scientific review of SBIR applications.

1995/96—DRG moved from the Westwood Building, where it had been since 1965, to the Rockledge Center, located near the NIH campus in Bethesda. Most of the Information Systems Branch was transferred to the Office of Extramural Research in the Office of the Director, NIH.

1997—Under a new Director, Dr. Ellie Ehrenfeld, DRG underwent a major reorganization and received a new name: the Center for Scientific Review (CSR). The name change reflected the Center's primary mission—scientific review of grant applications—and signaled an expanded focus on developing and implementing flexible and innovative ways for referral and scientific review. The Center was divided into 3 review divisions (Molecular and Cellular Mechanisms; Physiological Systems; and Clinical and Population-based Studies) plus the Division of Receipt and Referral; the Division of Management Services; the Office of Planning, Analysis, and Evaluation; and the Office of Outreach.

CSR also began a thorough examination of its Integrated Review Groups (IRGs) and their study sections. CSR received assistance from 2 types of external advisory groups that reported to the CSR Advisory Committee: (1) IRG working groups, which were established to evaluate individual IRGs (2) the Panel on Scientific Boundaries for Review (PSBR), which was established to assess the overall structure and function of the IRGs.

The review activities of the National Institute on Alcohol Abuse and Alcoholism, the National Institute on Drug Abuse, and the National Institute of Mental Health—at that time all components of the Alcohol, Drug Abuse, and Mental Health Administration—began to be integrated into CSR.

1999—The PSBR completed its Phase 1 report, which defined organizing principles for a rigorous yet fair review and provided recommendations for reconfiguring the IRGs. In addition, 8 IRG Working Groups were developed or under development to assess current IRGs.

2000—Phase 2 of the PSBR effort was initiated to implement the Panel's recommendations. A Study Section Boundary (SSB) Team of extramural scientists with a small number of NIH and CSR staff members was formed to design the first new IRG (Hematology). A 3-year plan was developed to initiate additional SSB Teams and complete the reorganization of the 24 IRGs proposed by PSBR.

A reviewer survey was distributed to all CSR review groups to assess reviewer satisfaction and workload burdens. Ninety percent of the respondents reported that they were at least "satisfied" with their service, and a majority of respondents reported that they were "very satisfied." Reviewers indicated that it takes an average of 30 hours to prepare an average of 6 written critiques and an additional 8 hours to prepare as a reader of approximately 2.5 applications.

2001—Major strides were made in completing CSR evaluation and reorganization efforts. IRG Working Group reports for nearly all existing IRGs were completed. Three SSB Teams completed the design of their IRGs: Hematology; Biology of Development and Aging; Musculoskeletal, Oral and Skin Sciences; and Cardiovascular Sciences. SSB Teams were developed to design 4 additional IRGs.

The number of CSR study sections increased to 153 with the addition of new review groups in the areas of biomedical information science and technology development, epidemiology, muscle biology, and oncological sciences. CSR also developed 12 new study sections to review fellowship applications.

2002—CSR further advanced its efforts to reorganize its IRGs. SSB Teams completed the design for 8 of the remaining 12 IRGs to be reorganized: (1) Bioengineering Sciences and Technologies; (2) Surgical Sciences, Biomedical Imaging, and Bioengineering; (3) Oncological Sciences; (4) Digestive Sciences; (5) Immunology; (6) Renal and Urological Sciences; (7) Endocrinology, Metabolism, Nutrition, and Reproductive Sciences; and (8) Infectious Diseases and Microbiology.

Strides were made in using new technologies to enhance CSR reviews. All chartered study sections were given access to the Internet Assisted Peer Review System, which allows reviewers to post their critiques and later read the critiques posted by others in their study section. In addition, the vast majority of CSR reviewers were given CDs with electronic copies of the grant applications to be considered by their review panel. The CDs are easier to transport and are bookmarked for easy navigation.

2003—Important milestones were reached in CSR's reorganization efforts. SSB teams completed their recommendations for the last IRGs to be designed: (1) Respiratory Sciences; (2) Genes, Genomes, and Genetics, (3) Biological Chemistry and Macromolecular Biophysics; and (4) Cell Biology. CSR also implemented its first redesigned IRG—the Hematology IRG—and advanced efforts to implement other IRGs.

Dr. Ellie Ehrenfeld stepped down as CSR's Director. Dr. Elias Zerhouni appointed CSR's Deputy Director, Dr. Brent Stanfield, to be the new Acting Director.

A CSR-coordinated effort to develop new ways to encourage, review, and fund innovative research grant applications was advanced and incorporated into the NIH

Roadmap for Medical Research initiative.

CSR restructured its 3 review divisions into 4 new divisions: (1) Division of Biologic Basis of Disease, (2) Division of Molecular and Cellular Mechanisms, (3) Division of Physiology and Pathology, and (4) Division of Clinical and Population-Based Studies.

In an effort to make the review focus of study sections more transparent, CSR gave names to study sections that were previously designated by their IRG affiliation and a number.

The Internet Assisted Review system was built into IMPAC, the grants system used by NIH. Reviewers now access the system through the NIH Commons, the venue for electronic communications between NIH and its principal investigators.

2004—The formal design stage for reorganizing CSR's scientific review groups as proposed by PSBR was completed in January 2004 after the CSR Advisory Committee endorsed the guidelines for the last groups to be reorganized. Study sections within all but 3 of the new IRGs met at least once.

CSR advanced outreach efforts to educate applicants, reviewers, and NIH staff by developing (1) an online video of a mock study section; (2) a new CSR exhibit booth, which was deployed at 6 major scientific meetings across the country; (3) CSR's first Annual Report; and (4) a new CSR logo.

All CSR study sections used the Internet-Assisted Review Peer Review system, and CSR helped advance pilot studies for the electronic submission of grant applications.

The CSR Advisory Committee held its last meeting on September 20, 2004. A new Peer Review Advisory Committee will advise the CSR and NIH on peer review issues and operations.

2005—The Peer Review Advisory Committee held its first meetings to provide comprehensive guidance to the NIH Director, CSR Director, and Deputy Director for Extramural Research on all NIH peer review policies and operations.

Dr. Antonio Scarpa assumed the responsibilities of CSR's Director on July 1, 2005.

CSR received the first electronic grant applications via grants.gov and prepared to receive most applications by October 1, 2006.

A new payment system was developed to replace the Scientific Review and Evaluation Awards system. Under the new system, reviewers attending study section meetings receive their honoraria and "flat-rate" reimbursements for meals and incidental expenses without having to submit vouchers. Reviewers will no longer need to submit vouchers for hotel expenses, which will be paid directly by NIH. All reviewer payments will be made electronically.

2006—CSR accelerated the release of summary statements to applicants and the ICs. Ninety-seven percent of its summary statements were released according to a new schedule: summary statements for new investigators submitting a RO1 should be posted within 10 days of the study section meeting and all other summary statements should be released within 30 days of the study section meeting. Applicants used to receive their summary statements between 1-3 months after their study section meetings.

CSR's Scientific Review Evaluation Award Office reduced NIH travel costs by issuing reviewers nonrefundable airline tickets instead of refundable tickets. Scientists flying to CSR review meetings were allowed to make one change per trip, with NIH covering the costs. Between June and December 2006, NIH saved $5.2 million. When this practice is expanded to all CSR and NIH reviewers, NIH will save over $10 million a year.

Two Web-based electronic modes for reviewing grants were deployed by CSR to improve the recruitment of well-qualified reviewers who find it difficult to travel to review meetings: online asynchronous discussions (secure chat rooms), and video-enhanced discussions.

CSR published data that suggests slight but significant differences in the scoring of clinical and nonclinical research applications are not related to (1) the percent of clinical applications assigned for review to a review group, (2) the greater costs of clinical research, or (3) the clinical research experience of the reviewers. The findings were described in "Outcomes of NIH Peer Review of Clinical Grant Applications," by Theodore Kotchen, et al., published in the January 2006 issue of the *Journal of Investigative Medicine*.

2007—As NIH expanded its ability to receive electronic grant applications, CSR responded by adjusting its administrative systems and practices. For the first time, applicants submitted their R01 grant applications electronically. In fact, most grant applications submitted to CSR in 2007 were electronic.

After the success of a pilot to shorten the review cycle for new investigators applying for an R01 grant, CSR shortened the review cycle for all new R01 grant applicants. A shorter cycle will allow some of these more than 10,000 applicants to reapply in the next review round instead of having to wait out a review cycle. The ultimate goal is to offer this opportunity to all applicants who need to revise their applications so the best science can advance more quickly.

CSR began a reorganization of its review divisions, by creating a fifth division and rearranging the review groups in its Division of Clinical and Population-Based Studies, now titled the "Healthcare, Population, and Behavioral Sciences Division." The fifth review division clusters neuroscience IRGs from 3 CSR divisions into 1 new division: the Division of Neuroscience, Development, and Aging. Consolidating CSR's neuroscience IRGs will enhance staff interactions; encourage shared recruitment of new SROs and reviewers; improve the balancing of workloads; and advance interactions with the NIH and the neuroscience community. CSR also created a new neuroscience IRG—Emerging Technologies and Training in Neurosciences—creating a home for new study sections focused on molecular neurogenetics and neurotechnology, as well as special emphasis panels to review fellowship and small business applications.

2008—CSR worked to enhance NIH peer review and help NIH identify the most promising research sooner by developing new incentives to recruit reviewers, implementing a major reorganization of study sections, preparing to assist NIH in implementing enhancements to peer review, and other measures.

CSR initiated solutions to recruit and retain high-quality reviewers, while decreasing their burden to serve the government by holding more meetings on the West Coast where many reviewers live, permitting permanent members of study sections to submit many of their applications anytime, and convening more electronic meetings that appeal to reviewers who cannot or will not travel to meetings. CSR also completed a reorganization of its review divisions and added a new one to cluster similar areas of science within the newly realigned organizational units, ensuring more effective and efficient reviews of applications and helping NIH achieve the greatest public health impact.

2009—Following recommendations by the internal and external stakeholders supporting the trans-NIH Enhancing Peer Review Initiative, CSR successfully implemented the most sweeping NIH enhancements to the NIH peer review systems: deploying a new scoring system, using new templates for reviewer critiques, permitting only one application resubmission, and clustering the review of New and Early Stage Investigator R01 and clinical research applications.

CSR simultaneously managed the receipt, assignment and review of the largest surge in grant applications NIH has ever seen. An extra 25,000 grant applications were submitted in 2009 for American Recovery and Reinvestment Act funds, which were appropriated to NIH to advance the economy, science and health. The bulk of these applications—over 20,000—were Challenge grant applications, which were all reviewed by 20,000 reviewers in two-stage editorial board review groups. Stage-one reviewers submitted their critiques online. Stage-two reviewers then examined the critiques and applications, focusing on the impact of the proposed research and assigning the final overall impact/priority scores.

2010—CSR helped stimulate the economy, research and healthcare by assisting the IRS as it implemented its Qualifying Therapeutic Discovery Project program, which issued $1 billion in tax credits or grants to small businesses. CSR engaged about 120 of its scientific review officers to help the IRS determine which of the 5,600 projects submitted met qualifications, were designed to meet the goals of the program, and had a reasonable chance of success.

CSR successfully implemented several NIH enhancements to peer review:

- Reviewers began reviewing shorter applications that were restructured so they are now better aligned with the review criteria to make the application and review process more efficient and transparent.
- NIH limited the types of supplemental materials applicants could send after having submitted their R01 and R21 applications. Since the majority of these supplements don't effect review outcomes, these limits will reduce unnecessary burdens on staff and reviewers.

2011—CSR Director Antonio Scarpa retired on September 2. Dr. Richard Nakamura was named Acting Director. He previously served as both Scientific Director and Deputy Director at the National Institute of Mental Health (NIMH). Dr. Nakamura also served as NIMH Acting Director from 2001 to 2002.

CSR developed an Early Career Reviewer Program to (1) train established scientists without prior experience reviewing NIH grant applications to become excellent reviewers, (2) enrich the talent pool of NIH reviewers by recruiting scientists from less research-intensive institutions, and (3) help emerging researchers advance their careers by exposing them to review experience. These reviewers are given light review loads so they can stay focused on advancing their research careers. CSR has encouraged volunteers from different scientific, cultural and geographic backgrounds to apply.

The CSR Advisory Council (CSRAC) replaced the NIH Peer Review Advisory Committee (PRAC).

2012—Dr. Richard Nakamura became CSR's Director on December 3, 2012 after serving as Acting CSR Director since September 2011.

CSR responded to emerging concerns from the scientific community: Dr. Nakamura responded to questions about CSR and NIH peer review changes and challenges after requesting community input. CSR's Advisory Council made five suggestions on ways NIH could help applicants with promising research ideas to survive through a period with historically low funding rates. CSR published advice for applicants on moving forward after failing to secure funding for their proposed research and published reminders for reviewers on the importance of basic and innovative research.

CSR established a peer review research unit to make sure that quality of peer review can be evaluated and continuously improved.

To facilitate review meetings that accommodate reviewers who cannot travel to face-to-face meetings and reduce costs, CSR launched/expanded hybrid video and face-to-face review meetings. In these meetings, some reviewers travel to a face-to-face meeting while others attend via a secure video link from their home or office.

BIOGRAPHICAL SKETCH OF DIRECTOR RICHARD NAKAMURA, PH.D.

On December 3, 2012, Dr. Richard Nakamura was named Director of the Center for Scientific Review (CSR) at the National Institutes of Health (NIH). He leads CSR's 450 scientists and administrative staff, overseeing their efforts to manage 80,000 incoming NIH grant applications a year and review the majority of them in CSR peer review groups. CSR holds 1,500 review meetings a year, involving about 16,000 reviewers from the scientific community.

Dr. Nakamura has had a 35-year tenure at the National Institute of Mental Health (NIMH), where he has served as both Scientific Director and Deputy Director of the institute, and he served as Acting Director from 2001 to 2002. During his time at NIMH, he received a number of leadership awards, including the Presidential Rank Award for outstanding leadership.

He came to NIMH in 1976 as a postdoctoral fellow. In the mid-80's he coordinated NIMH's Biobehavioral Program and later was Chief of its Integrative Neuroscience Research Branch. Between 1997 and 2007, he served as the institute's Deputy Director. From 2007 to 2011 he has been institute Scientific Director. While at NIMH, he also has held other positions, including Associate Director for Science Policy and Program Planning; Chief, Behavioral and Integrative Neuroscience Research Branch; and Coordinator, ADAMHA Office of Animal Research Issues.

Dr. Nakamura earned his B.A. in psychology from Earlham College in Richmond, Indiana, his M.A. in psychology from New York University, and his Ph.D. in psychology from the State University of New York in Stony Brook. He has expertise in a number of areas, including cognitive and comparative neuroscience, science

policy/funding and ethics in science. He has published 30 peer reviewed scientific journal articles, most related to neurocognition in primates.

CSR DIRECTORS

Name	In Office from	To
Cassius James Van Slyke	January 1946	December 1, 1959
David E. Price	1948	1950
Ernest M. Allen	1951	1960
Dale R. Lindsay	1960	1963
Eugene A. Confrey	October 1963	1969
Stephen P. Hatchett	1969	August 1976
Carl D. Douglass	August 1976	December 1985
Jerome G. Green	January 1986	June 1, 1995
Ellie Ehrenfeld	January 1997	September 30, 2003
Brent Stanfield (Acting)	October 1, 2003	June 30, 2005
Antonio Scarpa	July 1, 2005	September 2, 2011
Richard Nakamura	September 18, 2011	present

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Fogarty International Center

Mission | Important Events | Legislative Chronology | Director | Programs | Photo Gallery

VISION

The Fogarty International Center's vision is a world in which the frontiers of health research extend across the globe and advances in science are implemented to reduce the burden of disease, promote health, and extend longevity for all people.

MISSION

The Fogarty International Center is dedicated to advancing the mission of the National Institutes of Health by supporting and facilitating global health research conducted by U.S. and international investigators, building partnerships between health research institutions in the United States and abroad, and training the next generation of scientists to address global health needs.

IMPORTANT EVENTS IN FOGARTY HISTORY

1988—The AIDS International Training and Research Program began as one of the first of a new generation of research training programs sponsored by Fogarty. It has become a model for a number of research capacity-building programs in the developing world in such areas as tropical diseases, emerging infectious diseases, environmental and occupational health, and population-related research.

1992—Focused on the potential relationships between drug development, biological diversity, and economic growth, the International Cooperative Biodiversity Groups program was initiated in a collaborative effort of NIH, the National Science Foundation, and the U.S. Agency for International Development to advance their 3 interrelated goals.

The Fogarty International Research Collaboration Award program began as small international collaborative research grants to American investigators whose research would benefit from collaboration with a partner from Latin America or Eastern Europe. Today, the scope of this program has expanded to cover developing regions everywhere.

1995—The International Training and Research in Environmental and Occupational Health program—created with the close support of NIH's National Institute of Environmental Health Sciences and other partners—focuses on training local professionals in research on workplace and environmental protection and public health and safety, with an emphasis on implementing interventions targeted to specific conditions in the home country.

2003—The Informatics Training for Global Health program was created to fund international collaborations between the United States and low- and middle-income countries to develop informatics training programs in support of global health research.

2004—The International Collaborative Trauma and Injury Research Training Program was launched to address the growing burden related to trauma and injury in the developing world. It addresses training across the range of basic to applied science, the epidemiology of risk factors, acute care and survival, rehabilitation, and long-term mental health consequences.

2005—Fogarty began its Framework Program for Global Health to provide administrative support to link diverse schools—such as engineering, business, chemistry, biology, communication, and medicine—together on the topic of global health and to develop multidisciplinary global health curricula.

October 22, 2007—In an effort to focus attention on global health, Fogarty joined with the Council of Science Editors to promote its 2007 international theme issue on poverty and human development. Fogarty, in conjunction with NIH's National Library of Medicine, hosted the event at NIH to coincide with the simultaneous publication of related research by more than 235 scientific journals in 37 countries. At least 1,000 articles were disseminated, representing research projects taking place in 85 nations. View Image.

May 6, 2008— Stephen Lewis, a former diplomat and co-founder of AIDS-Free World, delivered a passionate lecture at Masur Auditorium, as part of Fogarty

International Center's 40th anniversary celebrations. Lewis described the plight of sub-Saharan countries struggling for survival, mired in a cycle of disease and despair caused by HIV/AIDS.

August 2, 2008— Fogarty recognized the 20th anniversary of its AIDS International Training and Research Program during a symposium and reception, which included current and former trainees in Mexico City, held as an affiliated event of the International AIDS Conference.

September 2, 2008—Congressman John E. Fogarty's legacy and the Center's 40th anniversary were recognized with events at Brown University. U.S. Sen. Jack Reed, Providence Mayor David Cicilline, and Fogarty family members celebrated with Center Director Dr. Roger I. Glass, who used the occasion to recognize Brown for its strong history in global health and to announce it would receive a Fogarty Framework grant to further develop its programs.

October 15, 2008—The Foundation for NIH hosted Fogarty's 40th anniversary gala dinner at the Italian embassy, which brought together leaders from Congress, federal agencies, science, advocacy groups, the diplomatic corps, and businesses with an interest in global health issues. Guests included Sen. Richard Lugar (R-IN) and Rep. Donald Payne (D-NJ), who were lauded for their global health leadership in Congress. View Image.

November 12, 2008— As part of its 40th anniversary celebrations, Fogarty held a symposium titled "The Role of Science in Advancing Global Health Diplomacy" at the Georgetown University Law Center. The discussion examined the relationship between science and diplomacy and how U.S. efforts in this arena could be strengthened. View Image.

December 16, 2008—Former NIH Director Dr. Harold Varmus delivered the 2008 David E. Barmes Global Health Lecture, titled "The U.S. Commitment to Global Health." Fogarty co-sponsors the annual event with the National Institute of Dental and Craniofacial Research in honor of the late David E. Barmes, who was a special expert for international health at NIDCR. View Image.

March 30, 2009—Fogarty International Center and the Foundation for the National Institutes of Health (FNIH) announced the launch of MAL-ED, a five-year study to investigate the linkages between malnutrition and intestinal infections and their effects on children in the developing world, funded by a grant of nearly $30 million from the Bill & Melinda Gates Foundation to the FNIH. Fogarty's Division of International Epidemiology and Population Studies serves as the Scientific Secretariat for this 8-site study located in Brazil, Peru, South Africa, Tanzania, India, Pakistan, Bangladesh and Nepal.

April 22, 2009—Jeffrey Sachs, health economist and best-selling author, visited NIH as a Fogarty scholar-in-residence and delivered a lecture to an overflow audience at Masur Auditorium. Sachs spoke about the importance of investing in global health despite the ongoing financial crisis, describing the need for systemic changes in the design, financing, management and delivery of health care around the world. The event was part of a series marking Fogarty's 40th anniversary, sponsored by the Foundation for the National Institutes of Health. View Image.

June 2009—Fogarty became a founding member of the Global Alliance for Chronic Diseases, a collaboration involving national health agencies of some of the biggest countries in the world, including NIH represented by the National Heart, Lung and Blood Institute and Fogarty, Australia's National Health Medical Research Council, Canadian Institutes of Health Research, China's Ministry of Health and the Chinese Academy of Medical Sciences, the Indian Council of Medical Research and the United Kingdom's Medical Research Council. Fogarty also began making initial grants in its Millennium Promise Awards program to train researchers in chronic diseases, which account for 60 percent of all deaths around the world.

July 22, 2009—Fogarty announced funding from the American Recovery and Reinvestment Act that will allow the NIH to create jobs for early career scientists and increase the ranks of researchers and clinicians working in the global health field. With $3 million in funding over an18-month period, Fogarty will be able to support 21 additional participants in its Clinical Research Training Scholars and Fellows Program.

August 2009—Fogarty hosted a meeting of the newly created Trans-NIH Global Health Research Working Group at the Stone House. The high-level working group is the result of a two-year effort by institute and center directors to analyze global health research activities at NIH and explore better ways to coordinate efforts, both across NIH and throughout the government. NIH director Dr. Francis Collins, who attended the meeting, urged members of the working group to find better ways to leverage resources and coordinate international activities to improve human health. View Image.

September 14-15, 2009—Fogarty co-hosted the first meeting of the Consortium of Universities for Global Health at NIH's Natcher Center. The consortium was created to increase public support and funding for new global health initiatives and build an alliance of universities to strengthen a field that students are demanding in unprecedented numbers. Guest speakers included White House health adviser Dr. Ezekiel Emanuel and U.S. Global AIDS Coordinator Dr. Eric Goosby, among others. View Images.

October 28-30, 2009—Fogarty played an instrumental role in the first mHealth Summit, a gathering of scientists, information technology developers and policymakers sponsored by the Foundation for the National Institutes of Health and Microsoft Research. The three-day event focused on the use of mobile technologies as tools and platforms for health research and health care delivery. The summit drew an overflow crowd, with about 500 attending in person and hundreds more via webcast. Fogarty Director Dr. Roger I. Glass spoke at the event, along with several prominent Fogarty grantees who had established mobile health projects in low-and middle-income countries. View Image.

January 2010—The highlights from the NIH portfolio analysis on climate change and health were released, the result of a series of meetings of the Trans-NIH Working Group on Climate Change. Convened by Fogarty, the meetings addressed the topic of climate change and its relationship to health research. The working group, chaired by Fogarty's Dr. Josh Rosenthal, brings together scientists from other federal agencies to share information and better coordinate research efforts.

February 22, 2010—Google collaborator and guru of global health data Dr. Hans Rosling drew a capacity crowd at Masur Auditorium when he presented a lecture titled "The New Health Gap: Science for Emerging Economies vs. the Bottom Billion." During his talk, Rosling took the audience through time to illustrate how the world has changed. A co-founder of Gapminder, a nonprofit that promotes a fact-based world view, he used his own Trendalyzer software to convert numbers into interactive graphics. Dr. Rosling visited NIH as a Fogarty International Center Scholar-in-Residence, concluding the Center's 40th anniversary activities. View Image.

February 26, 2010—Representatives from G8 countries met at NIH with leading researchers from sub-Saharan Africa, convened by Fogarty, to discuss African research capacity and how to move forward with commitments made at the 2009 L'Aquila Summit. The G8 Leaders Declaration had pledged to address health care improvement in Africa through a variety of strategies, including developing networks of researchers and working with African partners to establish a consortium of interdisciplinary centers of health innovation. View Image.

March 17, 2010—Following the Third Annual NIH Conference on the Science of Dissemination and Implementation, Fogarty and the Office of Behavioral and Social Sciences Research convened a satellite meeting on Implementation Science and Global Health in Bethesda. The event brought together Fogarty grantees and trainees working in the field of international implementation science, research training, and curriculum development, and explored strategies to build linkages between implementation science researchers to global healthcare delivery programs.

June 2010—The Fulbright Program joined Fogarty to expand clinical research training opportunities in sub-Saharan Africa for U.S. pre-doctoral students. The Fulbright-Fogarty Fellowships program will encourage innovative evidence-based public health research training, problem-based learning and clinical preceptorships. It will also encourage collaboration among the Fulbright-Fogarty fellows, who will be mentored by U.S. and African faculty and researchers. Together, the organizations will provide up to $205,000 per year to support as many as five awards. Initially, the one-year assignments will be distributed among six sites in Botswana, Malawi, South Africa, Uganda and Zambia. View Image.

June 17, 2010—Longtime Fogarty grantee Dr. Jean 'Bill' Pape visited NIH to report that HIV/AIDS research has resumed in full at Haitian Group for the Study of Kaposi's Sarcoma and Opportunistic Infections (GHESKIO), just months after Haiti's devastating earthquake. He addressed the NIH community while in town to accept the 2010 Gates Award for Global Health on behalf of GHESKIO—the world's first HIV/AIDS organization—which he founded nearly 30 years ago and still directs. View Image.

September 2010—NIH joined the Global Alliance for Clean Cookstoves, a new public-private partnership led by the United Nations Foundation. The initiative was announced by Secretary of State Hillary Rodham Clinton at the Clinton Global Initiative meeting in New York. Fogarty also continues to support research training programs to increase human capacity in low- and middle-income countries in the field of indoor air pollution and cookstove research. Half the world's population relies on elemental stoves for cooking or heating, and the resulting indoor air pollution is estimated to take 1.9 million lives each year. NIH has committed about $25 million over the next five years to reducing this impact and improving the health of cookstove users.

September 2010—Fogarty issued its final awards under the American Recovery and Reinvestment Act. Overall, the Center awarded about 100 grants under the two-year stimulus program, totaling roughly $30 million. An additional $8 million of stimulus funding is being administered by Fogarty for a project focused on implementing novel drugs, diagnostics, and devices in low-resource settings. Fogarty's share of Recovery Act funding was $17.4 million but its grantees successfully competed for an additional $13 million in funds from the central NIH pot. Five such applications were supported under the "Challenge" program, with $3 million of the funding coming from the central pool. Another $8 million came from the NIH Director's fund for the new implementation science consortium and about $2 million to support "Signature Framework" awards, which emphasize hands-on problem solving, collaborative approaches and innovative, multidisciplinary team research. 2010 awards included funds to support innovative multidisciplinary research projects and enhance studies involving human subjects.

September 24-26, 2010—>Several hundred alumni of the Fogarty International Clinical Research Scholars and Fellows (FICRS-F) program gathered near the NIH campus for their first-ever reunion and scientific symposium. The young scientists presented a broad range of research projects from more traditional infectious disease projects to cardiology and cancer studies. Many are also investigating novel ways to apply emerging technologies to speed up discoveries. View Image.

October 2010—The U.S. Department of Health and Human Services—including several components of the NIH— joined the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) in funding the Medical Education Partnership Initiative. The program, administered by Fogarty and the HIV/AIDS Bureau of the Health Resources and Services Administration, will invest as much as $130 million over five years to transform African medical education and dramatically increase the number of health care workers. The initiative will form a network including about 30 regional partners, country health and education ministries, and more than 20 U.S. collaborators. Grants have been awarded directly to African institutions in a dozen countries, working in partnership with U.S. medical schools and universities.

November 8-10, 2010—Fogarty participated in the second annual mHealth Summit, a gathering of scientists, information technology developers and policymakers organized by the Foundation for the National Institutes of Health. The three-day event focused on the use of wireless technologies to improve health outcomes in the U.S. and abroad. Fogarty Director Dr. Roger I. Glass gave closing remarks at the summit and several prominent Fogarty grantees who have established mobile health projects in low-and middle-income countries presented findings and shared insights. The summit drew over 2,000 attendees, hosted 149 exhibitors and included representatives from 48 countries. View Image.

February 15, 2011—USAID Administrator Dr. Rajiv Shah delivered the 2010 David E. Barmes Global Health lecture. Fogarty co-sponsors the annual event with the National Institute of Dental and Craniofacial Research in honor of the late David E. Barmes, who was a special expert for international health at NIDCR. View Image.

February 24, 2011—Global health advocate Lord Nigel Crisp visited NIH to give a talk sponsored by Fogarty on the importance of capacity building in the developing world. Crisp, a former chief executive of the U.K. National Health Service and a member of the U.K. House of Lords, works extensively in the fields of international development and global health. View Image.

March 2011—Fogarty worked with the Embassy of Chile in Washington to coordinate the loan of five tons of scientific and laboratory equipment from NIH to numerous Chilean university research laboratories and facilities severely damaged by the 8.8 magnitude earthquake and resulting tsunami of February 27, 2010. View Image.

March 7-9, 2011—The inaugural meeting of the Medical Education Partnership Initiative was held in South Africa. The more than 230 participants included several African ministers of health, deans and faculty of the region's leading medical schools, two U.S. ambassadors, the NIH director and numerous African and American collaborators. With funding from the U.S. President's Emergency Plan for AIDS Relief, known as PEPFAR, and the NIH, the program supports awards in a dozen African countries, which are being jointly administered by Fogarty and the Health Resources and Services Administration. Seventeen NIH Institutes and Centers and the Common Fund are participating in the initiative.

May 9-11, 2011—A two-day workshop organized by NIH, entitled "Health Burden of Indoor Air Pollution on Women and Children in Developing Countries," brought together research and policy experts to hammer out research priorities to reduce the health risks of cookstoves to women and children. The event was jointly arranged by the National Institute of Environmental Health Sciences (NIEHS), the National Institute for Child Health and Human Development (NICHD) and Fogarty.

September 2011—Fogarty awarded $14.4 million to 14 research institutions to reduce the impact of the ongoing global epidemic of non-communicable diseases in developing countries. The five-year Chronic, Non-Communicable Diseases and Disorders Across the Lifespan (NCD-Lifespan) grants will help to build the ranks of experienced clinicians and researchers by establishing research training programs in more than a dozen low-and middle-income countries. A wide range of curricula and training will be developed by the NCD-Lifespan grantees, including a cancer epidemiology certificate program for Moroccan health workers, cardiovascular-related education tracks in both health service and patient-oriented research for students in Ghana, biostatistics and mentoring curricula for Nigerian trainees, interdisciplinary training in substance dependence for investigators in Thailand, workshops and summer institutes for Thai dental students, one-to-one mentoring and peer-oriented training exercises for suicide researchers in China and long-term training in behavioral conditions and the social determinants of illness for mental health trainees in India.

September 6, 2011—Fogarty International Center and the National Library of Medicine presented Lessons from the MMR scare by Fiona Godlee, Editor in Chief of the British Medical Journal, on the NIH campus. Godlee presented a discussion of the stunning investigation she published earlier in 2011 that revealed the MMR vaccine scare was based not on bad science but on deliberate fraud. View Image.

November 16-18, 2011—Fogarty Director Dr. Roger I. Glass participated in the first annual U.S.-Russia Scientific Forum in Moscow, a three-day scientific meeting with several hundred participants, organized by the Foundation for NIH. More than a dozen U.S. and multinational companies are supporting this activity, with some expressing an interest in funding training and capacity building programs in United States for Russian scientists. The Russian government has also pledged to fund research grants to advance the understanding of these critical health issues that affect both populations. View Image.

December 2011—Fogarty Director Dr. Roger I. Glass accompanied NIH Director Dr. Francis Collins on a trip to India, where they toured research sites and saw examples of cutting-edge technology, highly trained medical personnel and other global health advancements. View Image.

December 5-7, 2011—Fogarty grantees and staff members participated in the third annual mHealth Summit, a meeting that drew more than 3,000 policymakers, scientists, clinicians, mobile communications experts and business executives from 48 countries. The event brought attendees together to discuss findings, share insights and debate the future direction of the rapidly growing mobile health field.

April 2012—To help foster the next generation of global health scientists, Fogarty and its NIH partners awarded about $20.3 million over the next five years to support 400 early-career health scientists on nearly year-long research fellowships in 27 low- and middle-income countries. The Fogarty Global Health Program for Fellows and Scholars will provide five consortia of academic institutions with about $4 million each, to support the training activities of a total of 20 partner institutions, helping to build a network of U.S. academic institutions to provide early-career physicians, veterinarians, dentists and scientists with a significant mentored research experience in a developing country.

May 2012—Fogarty research fellow Gaurvika Nayyar and senior scientific advisor emeritus Dr. Joel Breman published a groundbreaking study in the Lancet Infectious Diseases journal on poor quality antimalarial drugs and the urgent threat posed to vulnerable populations by drug resistance and inadequate treatment. They study, which received extensive media coverage, included surveys from seven Southeast Asian countries and 21 sub-Saharan African countries and found that 20 to 42 percent of malaria drugs in those regions were either poor quality or fake. Breman and Nayyar also contributed to a meeting report on artemisinin-resistant malaria which appeared in the American Journal of Tropical Medicine and Hygiene in August 2012.

May 17-19, 2012— As part of the warming of relations between U.S. and Burma, Fogarty Director Dr. Roger I. Glass traveled to Rangoon to represent the U.S. at an international science meeting and to discuss possible research collaborations with the country's health minister. In his role as lead U.S. health representative, Glass participated in the meeting of ASEAN's Committee on Science and Technology. He proposed that Fogarty and its federal partners host an influenza workshop in the region, which was met with enthusiasm. View Image July 21, 2012— Fogarty grantees and collaborators met at NIH to celebrate the 25th anniversary of the Center's AIDS International Training and Research Program (AITRP). The meeting coincided with the AIDS 2012 international conference held in Washington, D.C. View Image.

September 2012— To encourage much-needed innovations in global health, Fogarty awarded $8.5 million to support projects in five developing countries through the new Framework Programs for Global Health Innovation (FRAME Innovation). The five-year grants will fund multidisciplinary training and collaborations to produce ground-breaking solutions to entrenched problems such as childhood diarrhea, malaria control and maternal deaths, among others.

September 2012—Fogarty launched the Global Environmental and Occupational Health (GEOHealth) program, in partnership with the NIH's National Institute of Environmental Health Sciences (NIEHS) and the CDC's National Institute for Occupational Safety and Health. GEOHealth is intended to create regional hubs for collaborative research, data management, training and policy support regarding environmental and occupational health research in low- and middle-income countries. To support planning for the hubs, $3.2 million was awarded in two-year grants for activities in more than 15 countries.

October 9-12, 2012—To develop more expertise in indoor air pollution research, Fogarty's Center for Global Health Studies hosted a three-day training workshop. Faculty experts from academia, nongovernmental organizations, the NIH and other government agencies gave lectures and hands-on demonstrations of cookstoves and emissions testing to about 20 trainee scientists from the U.S. and seven developing countries. The event's partners included the National Institute of Environmental Health Sciences, National Institute of Child Health and Human Development, National Heart, Lung and Blood Institute, USAID, Environmental Protection Agency and Global Alliance for Clean Cookstoves. View Image.

LEGISLATIVE CHRONOLOGY

January 18, 1967—Rep. Melvin Laird (Wisc.) proposed that Congress establish an international research and study center at NIH as a memorial to the late Rep. John E. Fogarty (R.I.). President Lyndon B. Johnson subsequently announced that he was seeking funds to establish the John E. Fogarty International Center for Advanced Study in the Health Sciences.

February 26, 1968—Departmental approval was given to establish the Fogarty International Center.

March 16, 1968—Official notice was published in the Federal Register.

July 1, 1968—President Lyndon Johnson issued an Executive Order establishing the John E. Fogarty International Center at the National Institutes of Health. The NIH Office of International Research was abolished and several of its functions were transferred to FIC.

June 1979—The Task Force to Assess the Missions and Functions of the Fogarty International Center reported to the director, NIH, on its year-long study of the center, reaffirming FIC's importance as the focus for international aspects of biomedical and behavioral research at NIH, and recommending specific measures for strengthening and broadening its programs.

June 1982—FIC was designated a World Health Organization Collaborating Center for Research and Training in Biomedicine.

September 1985—The first meeting of the FIC Advisory Board was held.

November 1985—FIC was established in law (Public Law 99-158, sec. 482).

BIOGRAPHICAL SKETCH OF FOGARTY DIRECTOR ROGER I. GLASS, M.D., PH.D.

Dr. Glass was named Director of the Fogarty International Center and Associate Director for International Research by NIH Director Dr. Elias A. Zerhouni on March 31, 2006. Dr. Glass formally took office on June 11, 2006.

Dr. Glass graduated from Harvard College in 1967, received a Fulbright Fellowship to study at the University of Buenos Aires in 1967, and received his M.D. from Harvard Medical School and his M.P.H. from the Harvard School of Public Health in 1972. He joined the Centers for Disease Control and Prevention (CDC) in 1977 as a medical officer assigned to the Environmental Hazards Branch. He received his doctorate from the University of Goteborg, Sweden, in 1984, and joined the National Institutes of Health Laboratory of Infectious Diseases, where he worked on the molecular biology of rotavirus. In 1986, Dr. Glass returned to the CDC to become Chief of the Viral Gastroenteritis Unit at the National Center for Infectious Diseases.

Dr. Glass's research interests are in the prevention of gastroenteritis from rotaviruses and noroviruses through the application of novel scientific research. He has maintained field studies in India, Bangladesh, Brazil, Mexico, Israel, Russia, Vietnam, China, and elsewhere. His research has been targeted toward epidemiologic studies to anticipate the introduction of rotavirus vaccines. He is fluent and often lectures in 5 languages.

Dr. Glass has received numerous awards including the prestigious Charles C. Shepard Lifetime Scientific Achievement Award presented by the CDC in recognition of his 30-year career of scientific research application and leadership, and the Dr. Charles Merieux Award from the National Foundation for Infectious Diseases for his work on rotavirus vaccines in the developing world. Other honors include the U.S. Department of Health and Human Services (HHS) Secretary's Award for Distinguished Service, the Outstanding Unit Citation from the National Center for Infectious Diseases, the Outstanding Service Medal from the U.S. Public Health Service, and a Commendation Medal from the U.S. Public Health Service. He is a member of the Institute of Medicine (an arm of the National Academy of Sciences), the American Academy of Microbiology, the American Society of Microbiology, the American Association for the Advancement of Science, the American Society of Virology, and the American Epidemiological Society. Dr. Glass is also a fellow in the Infectious Disease Society and the American College of Epidemiology.

Dr. Glass has co-authored more than 400 research papers and chapters. He is married to Barbara Stoll, M.D., the George W. Brumley, Jr. Professor and Chair of the Department of Pediatrics at Emory University School of Medicine and the Medical Director of the Children's Healthcare of Atlanta at Egleston. He and his wife have 3 children.

FIC DIRECTORS

Name	In Office from	To
Milo D. Leavitt, Jr.	June 16, 1968	July 1978
Leon Jacobs	July 1, 1978	June 29, 1979
Edwin D. Becker (Acting)	July 1979	April 1980
Vida H. Beaven (Acting)	April 1980	January 1981
Claude Lenfant	February 1981	July 1982
Mark S. Beaubien (Acting)	July 1, 1982	January 1984
Craig K. Wallace	January 1984	December 1987
Carl Kupfer (Acting)	January 1, 1988	July 1988
Philip E. Schambra	August 1988	September 30, 1998
Gerald T. Keusch	October 1, 1998	December 31, 2003
Sharon H. Hrynkow (Acting)	January 1, 2004	May 2006
Roger I. Glass, M.D., Ph.D.	June 11, 2006	Present

RESEARCH AND RESEARCH TRAINING PROGRAMS

Training Grants

AIDS International Training and Research Program
This program supports HIV/AIDS-related research training to strengthen the capacity of institutions in low- and middle-income countries to conduct multidisciplinary biomedical and behavioral research to address the AIDS epidemic in the collaborating country. Grants are awarded to U.S. and developing country institutions with strong HIV-related research training experience and with HIV-related research collaborations with institutions in low- and middle-income countries. These institutions, in partnership with their foreign collaborating institutions, identify health scientists, clinicians, and allied health workers from the foreign countries to participate in their joint research training programs. Individuals from foreign nations who wish to become trainees must apply to the project director of an awarded grant.

Chronic, Non-Communicable Diseases and Disorders Across the Lifespan: Fogarty International Research Training Award
This program will support collaborative research training between institutions in the U.S. and low-and middle-income countries (LMIC), defined by the World Bank classification system. The proposed institutional research training program is expected to sustainably strengthen the research capacity of the LMIC institutions, and to train in-country experts to conduct research on chronic, non-communicable diseases and disorders, with the ultimate goal of implementing evidence-based interventions relevant to their countries. Examples of the non-communicable diseases that could be addressed include, but are not limited to, cancer, cardio- and cerebrovascular disease and stroke, chronic lung disease, diabetes, mental illness, neurological, substance abuse and developmental disorders.

Fogarty HIV Research Training Program
The overall goal of the program is to strengthen the human capacity to contribute to the ability of institutions in low- and middle-income countries to conduct HIV-related research on the evolving HIV-related epidemics in their country and to compete independently for research funding. With co-funding from other NIH Institutes, Centers and Offices, Fogarty has provided 25 years of support to HIV research through two HIV research training programs: the AIDS International Training and Research Program (AITRP) and the International Clinical, Operations and Health Services Research Training Award for AIDS TB program (ICOHRTA AIDS TB). Fogarty has consolidated these two programs into the new Fogarty HIV Research Training Program.

Fogarty International Collaborative Trauma and Injury Research Training Program
This program addresses the research needs related to the growing burden of morbidity and mortality in the developing world due to trauma and injury. The program is supported by Fogarty, 7 NIH partners, the CDC's National Center for Injury Prevention and Control, the Pan American Health Organization, and the World Health Organization (WHO). It addresses training across the range of basic to applied science, the epidemiology of risk factors, acute care and survival, rehabilitation, and long-term mental health consequences.

Framework Programs for Global Health
This initiative builds global health research capacity in the United States and abroad. Through the Framework Programs for Global Health, institutions create administrative frameworks to bring multiple schools (such as engineering, business, chemistry, biology, communication, public health, medicine, and environmental studies) together on the topic of global health and develop multidisciplinary global health curricula for undergraduates, graduates and professional school students. Each program leverages and enhances currently funded global health projects at the institution supported by NIH and other sponsors, as well as encourages new training opportunities, collaborations, and research.

Framework Programs for Global Health Innovation (FRAME Innovation)
FRAME Innovation will provide support to institutions in the U.S. and in low- and middle-income countries (LMICs) to build capacity within their institutions to develop broadly interdisciplinary, postdoctoral (or post-terminal degree) research training programs in global health directed towards encouraging innovation in health-related products, processes and policies. The program emphasizes hands-on, problem-solving, and collaborative approaches and allows U.S. and LMIC trainees to be trained together.

Fulbright-Fogarty Fellowships in Public Health
Fulbright-Fogarty Fellowships promote the expansion of research in public health and clinical research in resource-limited settings. Awards are for 9 months at the overseas site. They carry the benefits of Fulbright Full Grants to the country of assignment. Fogarty provides support to the research training site, as well as orientation for Fellows at NIH.

The Global Health Program for Fellows and Scholars
This program provides supportive mentorship, research opportunities and a collaborative research environment for early stage investigators from the U.S. and low- and middle-income countries (LMICs), as defined by the World Bank, to enhance their global health research expertise and their careers. The Global Health Program for Fellows and Scholars is based on the success and experience of the Fogarty International Clinical Research Scholars and Fellows (FICRS-F) Program.

Global Infectious Disease Research Training Program
This program enables institutions in the United States or in developing foreign countries to support current and future collaborative research-related training on infectious diseases that are predominately endemic in or impact upon people living in developing countries.

Informatics Training for Global Health
This initiative supports the development of informatics training programs that will contribute to global health research and informatics capacity in low- and middle-income countries in partnership with U.S. institutions.

International Research Ethics Education and Curriculum Development Award
This program allows domestic or foreign institutions to develop graduate curricula and provide training in international bioethics related to performing research in developing countries.

International Clinical, Operational, and Health Services Research and Training Award
This program supports training to facilitate collaborative, multidisciplinary, international clinical, operational, health services, and prevention science research between U.S. institutions and those in low- and middle-income nations.

International Clinical, Operational, and Health Services Research Training Award for AIDS and Tuberculosis
This program supports research training to strengthen the capacity of institutions to conduct clinical, operational, and health services research. These institutions are located in low- and middle-income countries where AIDS, TB, or both are significant problems. In Phase I, one-year planning grants to support the development of full research training applications in Phase II are awarded to institutions in low- and middle-income countries with strong HIV- or TB-related research experience. In Phase II, grants to support a research training program are awarded to Phase I awardees and to their United States or other developed country institutional partner with whom they have strong HIV- or TB-related research collaborations. Individuals who wish to become trainees must apply to the project director of an awarded grant.

International Research Scientist Development Award (IRSDA)
The purpose of the award is to provide junior U.S. scientists with an opportunity to pursue careers in research on global health, and to prepare them for independent research careers. This award is similar to other NIH K01 career development awards, but requires grantees to spend 50% of the grant period conducting research in developing countries. Two mentors are required, one in the U.S. and the other in the developing country where research is being conducted. These awards will support three- to five-years of “protected time” for mentored research and career development experiences, leading to an independent research career focused on global health. The IRSDA supports salary and some research expenses, including international travel.

Global Environmental and Occupational Health (GEOHealth)
The GEOHealth program will support paired consortium led by a LMIC institution and a U.S. institution to plan research, research training and curriculum development activities that address and inform priority national and regional environmental and occupational health policy issues. Initially the program will foster the planning for multidisciplinary GEOHealth hubs, which will lead collaborative research and training for focal environmental and occupational health issues in several core science areas, including fields such as epidemiology, biostatistics, genetics, environmental science, industrial hygiene, systems science, toxicology, behavioral science and implementation science.

Medical Education Partnership Initiative
This program supports foreign institutions in Sub-Saharan African countries that receive PEPFAR support and their partners to develop or expand and enhance models of medical education. These models are intended to support PEPFAR’s goal of increasing the number of new health care workers by 140,000, strengthen medical education systems in the countries in which they exist, and build clinical and research capacity in Africa as part of a retention strategy for faculty of medical schools and clinical professors.

Independent Scientist in Global Health Award
The overall objective of this program is to foster the development of outstanding independent scientists and enable them to expand their potential to make significant impact on the health related research needs of developing countries. This award provides three, four, or five years of salary and some research support. This award is similar to other NIH K02 career development awards, but requires grantees to spend 50% of the grant period conducting research in developing countries.

Research Grants

Brain Disorders in the Developing World: Research Across the Lifespan
This program supports collaborative research and capacity building projects on brain disorders throughout life, relevant to low- and middle-income nations. Funded projects focus on neurological disorders and function (including sensory, motor, cognitive, and behavioral) and the impairment they lead to throughout life. R21 grants provide support to conduct pilot studies and to organize, plan for, prepare, and assemble an application for a more comprehensive R01 grants. R01 awards involve substantial collaboration between developed and developing country investigators and incorporate both research and capacity building.

Ecology and Evolution of Infectious Diseases
This program funds interdisciplinary research projects that strive to elucidate the underlying ecological and biological mechanisms that govern the relationships, environmental changes, and the transmission dynamics of infectious diseases. The focus of this program is on the development of predictive models for the emergence and transmission of diseases in humans and other animals, and ultimately to facilitate the development of strategies to prevent or control them.

The Japan Society for the Promotion of Science
The Japan Society for the Promotion of Science, as the funding agency, provides 3 types of scientific collaboration fellowships using the NIH as a nominating authority. One type of Fellowship Program allows Japanese Biomedical and Behavioral Scientists to conduct research at NIH. The other 2 types allow U.S. (and permanent resident) scientists to participate in research with scientists from developing countries.

Fogarty International Research Collaboration Award (FIRCA)
This program provides funds ($32,000/year direct costs) to foster international research partnerships between NIH-supported U.S. scientists and their collaborators in countries of the developing world. The FIRCA program aims to benefit the research interests of both the U.S. and foreign collaborators while increasing research capacity at the foreign site. U.S. scientists who have an eligible NIH grant may apply as Principal Investigators. Former FIRCA foreign collaborators may also apply as Principal Investigators. All areas of biomedical, behavioral, and social science research supported by NIH are eligible FIRCA research topics.

Global Research Initiative Program for New Foreign Investigators (GRIP)
This initiative promotes productive re-entry of NIH-trained foreign investigators into their home countries as part of a program to enhance the scientific research infrastructure in developing countries, to stimulate research on high priority health-related issues in these countries, and to advance NIH efforts to address health issues of global import. The GRIP provides partial salaries to the foreign researcher returning home and support for research projects.

International Cooperative Biodiversity Groups

This program integrates drug discovery from natural products with conservation of biodiversity and scientific and economic development in host countries. The program is jointly funded by the National Institutes of Health, the National Science Foundation, and the Foreign Agriculture Service of the U.S. Department of Agriculture.

International Tobacco and Health Research and Capacity Building Program

This program encourages transdisciplinary approaches to the international tobacco epidemic to reduce the global burden of tobacco-related illness. The program is designed to promote international cooperation between investigators in the U.S. and other high-income nation(s) pursuing research programs on tobacco control, and scientists and institutions in low- and middle-income nation(s), where tobacco consumption is a current or anticipated public health urgency.

Fogarty Organization

Division of International Relations

The international relations division develops new partnerships among U.S. scientists, institutions, and counterparts abroad to advance research and training in the biomedical and behavioral sciences. The division works on behalf of Fogarty and the whole of NIH to identify opportunities for collaboration with foreign science-funding agencies, the U.S. Department of State, U.S. technical agencies, and international organizations. It forms agreements with other nations to establish research collaborations and commitments for home country support for foreign researchers returning from NIH fellowships to facilitate their successful re-entry.

Division of International Epidemiology and Population Studies

Fogarty's in-house scientists conduct research on the epidemiology and mathematical modeling of infectious diseases. Primary concentrations include cross-national studies of mortality patterns with special emphasis on influenza, vector-borne diseases, and vaccine-preventable diseases. Since 2000, these scientists, with collaborators in more than 24 countries, have produced research used to guide domestic and international policy in the development of countermeasures for potential bioterror agents and public health measures to control the spread of infectious diseases.

Division of International Science Policy, Planning, and Evaluation

The policy division provides strategic guidance to Fogarty's director on the development, analysis and evaluation of Fogarty's programs and on international science policy issues. The division tracks activities of international funding agencies and research trends in global health. The division also advises Fogarty's director on legislative and partnership matters and manages the Center's involvement in the Disease Control Priorities Project.

Division of International Training and Research

The international training and research division administers research grants, training grants and fellowship programs at sites in more than 100 countries. Fogarty programs that build the research pipeline are anchored to peer-reviewed research grants and designed to be collaborative, long term and flexible. Nearly a quarter of Fogarty awards are made directly to robust research institutions in the developing world. The remaining grants support scientists at U.S. institutions who collaborate with colleagues abroad. About one-third of Fogarty's grants focus on scientific discovery, and two-thirds support research training.

This page last reviewed on September 20, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Recent Photos from the Fogarty International Center (FIC)

2012 PHOTOS

Fogarty Director Dr. Roger I. Glass (left) visited Burma to discuss possible research collaborations with the country's health minister, Dr. Pe Thet Khin. (Photo courtesy of U.S. State Department)
lo-res | hi-res

NIH director Dr. Francis Collins (second from left) discusses indoor air pollution with Dr. Bill Martin of NICHD while observing a cookstove demonstration with workshop participants and other guests. (Photo by Michael Spencer for Fogarty/NIH)
lo-res | hi-res

Fogarty grantees and collaborators met to celebrate the 25th anniversary of the Center's AIDS International Training and Research Program (AITRP). (Photo by Jeff Gray/Fogarty)
lo-res

2011 PHOTOS

NIH Director Dr. Francis S. Collins and USAID Administrator Dr. Rajiv Shah said they are working to better connect NIH research discoveries with global health development. Shah delivered the 2010 David E. Barmes Global Health lecture. (Photo by Michael Spencer, NIH Medical Arts and Photography Branch)
lo-res | hi-res

Speaking at an event hosted by Fogarty, Lord Nigel Crisp said that health professionals should look to low- and middle-income countries for low-cost innovations. (Photo by Ernie Branson, NIH Medical Arts and Photography Branch)
lo-res | hi-res

Fogarty worked with the Embassy of Chile in Washington to coordinate the loan of five tons of scientific and laboratory equipment from NIH to numerous Chilean university research laboratories and facilities severely damaged by the 2010 earthquake. The 84 pieces of equipment included computers, microscopes, micro-injectors, centrifuges, freezers and other items. (Photo by Dr. Jim Herrington, Fogarty International Center)
lo-res | hi-res

Fiona Godlee, Editor in Chief of the British Medical Journal, presented a discussion of the stunning investigation she published that revealed the MMR vaccine scare was based not on bad science but on deliberate fraud. (Photo by Jeff Gray, Fogarty International Center)
lo-res | hi-res

Fogarty Director Dr. Roger I. Glass spoke at the first annual U.S.-Russia Scientific Forum. The event was held in Moscow to explore research collaborations in areas of common interest. (Photo courtesy of the Foundation for the National Institutes of Health)
lo-res | hi-res

NIH Director Dr. Francis Collins discussed possible research partnerships with young scientists on a recent trip to India. Fogarty Director Dr. Roger I. Glass accompanied Dr. Collins on the trip, touring the country's top research sites, reviewing existing collaborations and discussing potential new areas for partnership. (Photo by Dr. Roger I. Glass, Fogarty International Center)
lo-res | hi-res

2010 PHOTOS

Dr. Hans Rosling of the Karolinska Institute drew a standing-room only crowd at his talk titled, "The New Health Gap: Science for Emerging Economies vs. the Bottom Billion." (Photo by Ernie Branson)


lo-res
| hi-res


G8 representatives and leading African researchers met at NIH to discuss African research capacity. (Photo by Bill Branson)
lo-res | hi-res

Fulbright logo courtesy of U.S. Department of State
lo-res | hi-res


Longtime Fogarty grantee Dr. Jean 'Bill' Pape visited NIH to report his center's HIV/AIDS research has resumed, just months after Haiti's devastating 2010 quake. (Photo by Bill Branson).
lo-res | hi-res


NIH Director Dr. Francis S. Collins learns about one participant's experience in Fogarty's Scholars and Fellows program. (Photo courtesy of the Vanderbilt Institute for Global Health.)
lo-res | hi-res


Fogarty Director Dr. Roger I. Glass greets Bill Gates, who was a keynote speaker at the 2010 mHealth summit. (Photo Courtesy of Foundation for the National Institutes of Health.)
lo-res | hi-res

2009 PHOTOS


Fogarty Director Dr. Roger I. Glass introduces NIH Director Dr. Francis Collins to longtime Fogarty grantee Dr. Patricia Garcia, of Peru's Cayetano Heredia University at the first meeting of the Consortium of Universities for Global Health. (Photo by Will Kirk, Johns Hopkins University)
lo-res | hi-res


Boston University associate provost and former Fogarty director, Dr. Gerald Keusch (center), catches up with Fogarty staffers Dr. Ken Bridbord (left) and Dr. Flora Katz (right) during the Consortium of Universities for Global Health meeting at NIH. (Photo by Jeff Gray, Fogarty International Center)
lo-res | hi-res


U.S. Department of Health and Human Services Secretary Kathleen Sebelius was one of the keynote speakers at the 2009 mHealth Summit, sponsored by the Foundation for the National Institutes of Health and Microsoft Research.
lo-res | hi-res


Health economist and Fogarty Scholar-in-Residence Dr. Jeffrey Sachs, tells an overflow audience at NIH, "We still have the need, we still have the opportunity" to improve global health. "The question is whether we can get organized." (Photo by Bill Branson, NIH Medical Arts and Photography Branch)
lo-res | hi-res


NIH director Dr. Francis Collins urges members of the new trans-NIH working group on global health research to find better ways to leverage resources and coordinate international activities to improve human health. (Photo by Michael Spencer, NIH Medical Arts and Photography Branch)
lo-res | hi-res

2008 PHOTOS


Fogarty International Center marked its 40th anniversary with a gala dinner at the Italian Embassy in Washington on October 15, 2008. The event—sponsored by the Foundation for NIH—brought together leaders from Congress, federal agencies, the scientific community, advocacy groups, the diplomatic corps, and business leaders to celebrate Fogarty's 4 decades of contributions to global health. (From left): Foundation for NIH Chairman Dr. Charles A. Sanders greeted Fogarty Director Dr. Roger I. Glass and Sen. Richard Lugar (R-Ind.).
lo-res | hi-res


As part of Fogarty's 40th anniversary celebrations, the Center co-sponsored a symposium titled "The Role of Science in Advancing Global Health Diplomacy," held at the Georgetown University Law Center on Nov. 12, 2008. Panelists included (from left): Former U.S. Ambassador to Uganda Jimmy Kolker; former NIH Director Dr. Elias Zerhouni, and Harvard School of Public Health Professor Dr. Jim Kim. (Photo by Jeff Gray, Fogarty International Center)
lo-res | hi-res


Former NIH Director Dr. Harold Varmus delivered the 2008 David E. Barmes Global Health Lecture titled "The U.S. Commitment to Global Health." Fogarty co-sponsors the annual event with the National Institute of Dental and Craniofacial Research in honor of the late David E. Barmes, who was a special expert for international health at NIDCR. (Photo by Ernie Branson, NIH Medical Arts and Photography Branch)
lo-res | hi-res

2007 PHOTOS

On October 22, 2007, NIH's Fogarty International Center and National Library of Medicine co-sponsored the launch of the Council of Science Editor's global theme issue on poverty and human development. The event coincided with the publication of related research by more than 230 journals worldwide. Researchers gathered from around the world to present scientific discoveries published as part of the theme issue.
lo-res | hi-res

Fogarty Director Dr. Roger I. Glass (center) accompanied U.S. Health and Human Services Secretary Michael Leavitt (left) on a visit to Africa in August 2007. They met with local officials and observed U.S. government programs that are delivering health care to underserved communities.
lo-res | hi-res

This page last reviewed on April 10, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

NIH...Turning Discovery Into Health®

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

National Center for Advancing Translational Sciences

Mission | Important Events | Legislative Chronology | Director | Programs

MISSION

NCATS' mission is to catalyze the generation of innovative methods and technologies that will enhance the development, testing and implementation of diagnostics and therapeutics across a wide range of human diseases and conditions. NCATS strives to support research to reduce, remove or bypass costly and time-consuming bottlenecks in the therapeutic development pipeline.

By improving this process, NCATS aims to make translational science more efficient, less expensive and less risky. In this way, NCATS is complementing — not competing with — the work of the private sector or other NIH Institutes and Centers.

IMPORTANT EVENTS IN NCATS HISTORY

December 2011—NCATS is established on December 23, 2011.

March 2012—NCATS teamed up with pharmaceutical leader Eli Lilly and Company to explore new and different uses for existing medicines. View Image.

April 2012—NCATS and Eli Lilly and Company jointly released an online *Assay Guidance Manual* designed to provide researchers with step-by-step guidance through the complex process of turning a basic research finding into an assay that will start the process of discovering pharmacological tools and drugs.

May 2012—The Discovering New Therapeutic Uses for Existing Molecules (Therapeutics Discovery) program was launched to develop partnerships between pharmaceutical companies and the biomedical research community to advance therapeutic development. View Image.

May 2012—A team of NIH-funded scientists developed a new method that changes the way genes are regulated to effectively cause cancer tumors to shrink and die in the laboratory. View Image.

July 2012—A research collaboration including scientists from NCATS and the University of Wisconsin-Madison, helped identify three promising molecular compounds from a collection of approved drugs to pursue as potential treatments for Charcot-Marie-Tooth disease (CMT), a genetic neurological disease for which there are no current treatments.

July 2012—NCATS solicited applications for institutional Clinical and Translational Science Awards. In fiscal year 2013, NCATS expects to provide approximately $110 million to fund up to 18 awards in response to the U54 solicitation.

July 2012—NIH awarded 17 grants for projects designed to create 3-D chips with living cells and tissues that accurately model the structure and function of human organs, such as the lung, liver and heart. These awards are funded and administered by NCATS. In September 2012, NIH awarded two additional tissue chip grants, administered by NCATS, but funded by other NIH Institutes and Centers. View Image.

August 2012—A team that includes nine NCATS researchers has identified compounds that delay tumor formation in mice. The compounds target a specific form of pyruvate kinase, called PKM2, which governs how cancer cells use glucose.

August 2012—A collaborative research team, including nine experts from NCATS, was honored on August 30, 2012, for its work on an investigational treatment for Niemann-Pick disease type C (NPC), a rare genetic disease of cholesterol storage that eventually leads to neurodegeneration. View Image.

August 2012—NCATS announced the members of its inaugural Advisory Council and Cures Acceleration Network Review Board.

September 2012—NIH Director Francis S. Collins, M.D., Ph.D., announced the appointment of Christopher P. Austin, M.D., as director of NCATS. View Image.

October 2012—Researchers from NCATS designed a novel drug discovery method that uses two co-expressed reporter genes rather than one to increase the odds of

identifying candidate compounds with true activity against biological or disease targets.

November 2012—Researchers from 13 universities and hospitals, including 10 CTSA institutions, partnered with the Cystic Fibrosis Foundation and the drug manufacturer Vertex Pharmaceuticals to conduct clinical trials and obtain FDA approval for the drug Kalydeco as a new treatment. View Image.

December 2012—The NIH Bridging Interventional Development Gaps (BrIDGs) program administered by NCATS announced new projects to develop potential treatments for cancers, spinal cord injury and a rare disease. View Image.

NCATS LEGISLATIVE CHRONOLOGY

December 23, 2011—President Obama signed into law P.L. 112-74, the Fiscal Year 2012 Consolidated Appropriations Act, enabling the NIH to establish NCATS.

BIOGRAPHICAL SKETCH OF NCATS DIRECTOR CHRISTOPHER P. AUSTIN, M.D.

On September 14, 2012, NIH Director Francis S. Collins, M.D., Ph.D., announced the appointment of Christopher P. Austin, M.D., as director of the National Center for Advancing Translational Sciences (NCATS). Austin succeeded former acting director of NCATS and current director of the National Institute of Mental Health Thomas R. Insel, M.D., on September 23, 2012.

Austin served as director of the NCATS Division of Pre-Clinical Innovation since the creation of the Center in December 2011. He is leading NCATS in its mission by applying his experience in nearly every stage of the research pipeline to build on the Center's momentum in finding innovative ways to revolutionize the process of translation through innovative research and collaborations.

Austin came to NIH in 2002 from Merck, where his work focused on genome-based discovery of novel targets and drugs. He began his NIH career as the senior advisor to the director for translational research at the National Human Genome Research Institute, where he initiated the Knockout Mouse Project and the Molecular Libraries Roadmap Initiative. Other NIH roles have included serving as director of the Therapeutics for Rare and Neglected Diseases program as well as the NIH Chemical Genomics Center and as scientific director of the NIH Center for Translational Therapeutics.

Austin earned a medical degree from Harvard Medical School and an undergraduate degree in biology from Princeton University. He completed clinical training in internal medicine and neurology at Massachusetts General Hospital as well as a fellowship in genetics at Harvard.

NCATS DIRECTORS

Name	In Office from	To
Thomas R. Insel, M.D. (Acting)	December 23, 2011	September 22, 2012
Christopher P. Austin, M.D.	September 23, 2012	Present

MAJOR PROGRAMS

NCATS unifies programs in three areas:

- **Clinical and Translational Science Activities**
  - The Clinical and Translational Science Awards program supports a national consortium of medical research institutions that are transforming the way biomedical research is conducted. CTSAs strengthen and support the entire spectrum of translational research by developing and providing the expertise, tools, training and collaborations to conduct and drive improvements in human subjects research.
- **Rare Diseases Research and Therapeutics**
  - The Therapeutics for Rare and Neglected Diseases program aims to encourage and speed the development of new drugs for rare and neglected diseases. TRND stimulates drug discovery and development research collaborations among NIH and academic scientists, nonprofit organizations, and pharmaceutical and biotechnology companies working on rare and neglected illnesses. In addition to developing new candidate drugs for rare and neglected diseases, the TRND program is designed to advance the entire field of drug development by encouraging scientific and technological innovations aimed at improving success rates in the crucial preclinical stage of development.
  - The Bridging Interventional Development Gaps program —is supported by the NIH Common Fund — makes available, on a competitive basis, certain critical resources needed for the development of new therapeutic agents. Investigators do not receive grant funds through this program. Instead, successful applicants receive free access to NIH contractors who conduct preclinical services, such as toxicology studies, for therapeutic projects that have demonstrated efficacy in a disease model.
  - The Office of Rare Diseases Researchsupports and coordinates rare disease research, responds to research opportunities for rare diseases and provides information on rare diseases. ORDR serves the needs of patients who have any one of the thousands of rare diseases known today.
- **Re-engineering Translational Sciences**
  - Discovering New Therapeutic Uses for Existing Molecules (Therapeutics Discovery) is a collaborative pilot program designed to develop partnerships between pharmaceutical companies and the biomedical research community to advance therapeutic development. This innovative program matches researchers with a selection of molecular compounds from industry to test ideas for new therapeutic uses, with the ultimate goal of identifying promising new treatments for patients.
  - The Tissue Chips for Drug Screening initiative aims to develop 3-D human tissue chips that accurately model the structure and function of human

organs, such as the lung, liver and heart. Once developed, researchers can use these models to predict whether a candidate drug, vaccine or biologic agent is safe or toxic in humans in a faster and more cost-effective way than current methods.

- The NIH Chemical Genomics Center aims to translate the discoveries of the Human Genome Project into biological and disease insights and ultimately new therapeutics for human disease through small molecule assay development, high-throughput screening, cheminformatics and chemistry. The NCGC provides researchers with access to the large-scale screening and chemistry capacity necessary to identify compounds that can be used as chemical probes to validate new therapeutic targets.
- The Toxicology in the 21st Century program, a federal collaboration involving the NIH, Environmental Protection Agency, and Food and Drug Administration, is aimed at developing better toxicity assessment methods. The goal is to quickly and efficiently test whether certain chemical compounds have the potential to disrupt processes in the human body that may lead to adverse health effects.

NCATS' Cures Acceleration Network (CAN) enables overarching and flexible support for a variety of initiatives and is designed to address scientific and technical challenges that impede transitional research.

This page last reviewed on February 22, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

National Center for Complementary and Alternative Medicine

Mission | Important Events | Legislative Chronology | Director | Divisions | Photo Gallery

MISSION

The mission of the National Center for Complementary and Alternative Medicine (NCCAM) is to define, through rigorous scientific investigation, the usefulness and safety of complementary and alternative medicine interventions and their roles in improving health and health care. The Center's vision is that scientific evidence informs decision making by the public, by health care professionals, and by health policymakers regarding use and integration of these approaches.

NCCAM's programs and organization incorporate 3 long-range goals:

- Advance the science and practice of symptom management.
- Develop effective, practical, personalized strategies for promoting health and well-being.
- Enable better evidence-based decision making regarding complementary and alternative medicine use and its integration into health care and health promotion.

Five major objectives serve the above goals:

- Advance research on mind and body interventions, practices, and disciplines.
- Advance research on complementary and alternative medicine natural products.
- Increase understanding of "real world" patterns and outcomes of complementary and alternative medicine use and its integration into health care and health promotion.
- Improve the capacity of the field to carry out rigorous research.
- Develop and disseminate objective, evidence-based information on complementary and alternative medicine interventions.

NCCAM sponsors and conducts research to study complementary health approaches, using scientific methods and advanced technologies, at scientific institutions in the United States and around the world. Examples of studies include investigator-initiated and NCCAM-solicited projects, intramural research, basic mechanistic research, translational research, clinical trials, and research centers.

NCCAM also disseminates authoritative information through many avenues, including:

- A Web site, nccam.nih.gov
- The NCCAM Information Clearinghouse, at http://nccam.nih.gov/health/clearinghouse/index.htm
- Publications such as the *NCCAM Clinical Digest*, the *NCCAM Update*, and fact sheets
- Social media such as a research blog, Facebook, Twitter, and YouTube
- Lectures, conferences, symposia, and other outreach activities, including exhibits
- An online continuing education series
- Outreach to health care providers and the public to promote dialogue about complementary health approaches, at nccam.nih.gov/timetotalk/.

IMPORTANT EVENTS IN NCCAM HISTORY

October 1991—The U.S. Congress passes legislation (Public Law 102-170) that provides $2 million in funding for fiscal year 1992 to establish an office within the National Institutes of Health (NIH) to investigate and evaluate promising unconventional medical practices.

October 1992—Dr. Joseph J. Jacobs is appointed first Director of the Office of Alternative Medicine (OAM).

June 1993—The NIH Revitalization Act of 1993 (P.L.103-43) formally establishes the OAM within the Office of the Director, NIH, to facilitate study and evaluation of complementary and alternative medical practices and to disseminate the resulting information to the public.

October 1998—NCCAM is established by Congress under Title VI, Section 601 of the Omnibus Appropriations Act of 1999 (P.L. 105-277). This bill amends Title IV of the Public Health Service Act and elevates the status of the OAM to an NIH Center.

January 1999—Dr. William R. Harlan is named Acting Director of NCCAM.

February 1999—The U.S. Secretary of Health and Human Services (HHS) signs the organizational change memorandum creating NCCAM and making it the 25th independent component of NIH.

May 1999—The NCCAM Trans-Agency CAM Coordinating Committee is established by the NCCAM Director to foster the Center's collaboration across the HHS and other Federal agencies.

August 1999—The National Advisory Council on Complementary and Alternative Medicine (NACCAM) is chartered.

October 1999—Dr. Stephen E. Straus is appointed the first Director of NCCAM.

September 2000—NCCAM publishes its first strategic plan, *Expanding Horizons of Health Care*.

February 2001—NCCAM and the National Library of Medicine launch *CAM on PubMed*, a comprehensive Internet source of research-based information.

May 2004—NCCAM and the National Center for Health Statistics of the U.S. Centers for Disease Control and Prevention announce findings from the largest nationally representative survey to date on Americans' use of complementary health approaches. The data is from an NCCAM-funded supplement to the 2002 National Health Interview Survey (NHIS).

January 2005—The National Academies' Institute of Medicine releases a report, *Complementary and Alternative Medicine in the United States*, requested by NCCAM and Federal partners.

February 2005—NCCAM publishes its second strategic plan, *Expanding Horizons of Health Care: Strategic Plan 2005-2009*.

November 2006—The Center's founding Director, Dr. Stephen E. Straus, steps down and becomes Senior Advisor to NIH Director Dr. Elias A. Zerhouni. Dr. Ruth L. Kirschstein is named Acting Director of NCCAM.

May 2007—NCCAM establishes a Complementary and Integrative Medicine Consult Service at the NIH Clinical Center.

January 2008—Dr. Josephine P. Briggs is named second Director of NCCAM.

December 2008—The 2007 NHIS yields the first nationally representative data on children's use of complementary health approaches and on trends in adults' use of those approaches.

February 2009—NCCAM marks its 10th anniversary with a year of special events, including the inaugural Stephen E. Straus Distinguished Lecture in the Science of Complementary and Alternative Medicine and NCCAM's 10th Anniversary Research Symposium.

July 2009—The 2007 NHIS yields the first nationally representative data on Americans' spending on complementary health approaches.

February 2011—NCCAM releases its third strategic plan, *Exploring the Science of Complementary and Alternative Medicine: Third Strategic Plan 2011-2015*.

July 2012—M. Catherine Bushnell, Ph.D., is appointed scientific director of a new, state-of-the-art NIH research program headquartered in NCCAM's intramural division and focusing upon the role of the brain in perceiving, modifying, and managing pain.

NCCAM LEGISLATIVE CHRONOLOGY

October 1991—Public Law 102-170 provided $2 million to the National Institutes of Health (NIH) to establish an office and advisory panel to recommend a research program that would investigate promising unconventional medical practices.

June 1993—Public Law 103-43, the NIH Revitalization Act of 1993, established the OAM within the Office of the Director of NIH. The purpose of the Office was to facilitate the evaluation of alternative medical treatment modalities and to disseminate information to the public via an information clearinghouse.

October 1998—Public Law 105-277, the Omnibus Consolidated and Emergency Supplemental Appropriations Act, elevated the status and expanded the mandate of the OAM by authorizing the establishment of NCCAM. This act amended Title IV of the Public Health Service Act.

BIOGRAPHICAL SKETCH OF NCCAM DIRECTOR JOSEPHINE P. BRIGGS, M.D.

Josephine P. Briggs, M.D., an accomplished researcher and physician, is Director of the National Center for Complementary and Alternative Medicine. Dr. Briggs brings a focus on translational research to the study of complementary and integrative health practices help build a fuller understanding of the usefulness and safety of these approaches.

Dr. Briggs received her A.B. *cum laude* in biology from Harvard-Radcliffe College and her M.D. from Harvard Medical School. She completed her residency training in internal medicine and nephrology at the Mount Sinai School of Medicine, New York, NY, where she was also chief resident in the Department of Internal Medicine and a fellow in clinical nephrology. She then held a research fellowship in physiology at Yale School of Medicine, New Haven, CT. Dr. Briggs was a research scientist for 7 years at the Physiology Institute at the University of Munich, Munich, Germany.

In 1985, Dr. Briggs moved to the University of Michigan, Ann Arbor, MI, where she held several academic positions, including associate chair for research in the Department of Internal Medicine and professorships in the Division of Nephrology, Department of Internal Medicine and the Department of Physiology.

Dr. Briggs joined the National Institutes of Health (NIH) in 1997 as director of the Division of Kidney, Urologic, and Hematologic Diseases at the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), where she oversaw extramural research activities. While at NIDDK, she co-chaired an NIH Roadmap Committee on Translational Core Resources. In 2006, she accepted a position as senior scientific officer at the Howard Hughes Medical Institute.

Dr. Briggs' research interests include the renin-angiotensin system, diabetic nephropathy, circadian regulation of blood pressure, and the effect of antioxidants in kidney disease. She has published more than 175 research articles, book chapters, and scholarly publications. Dr. Briggs also has served on the editorial boards of several journals (including the *Journal of Laboratory and Clinical Medicine*, *Seminars in Nephrology*, and *Hypertension*) and was deputy editor for the *Journal of Clinical Investigation*.

Dr. Briggs is an elected member of the American Association of Physicians and the American Society of Clinical Investigation and a fellow of the American Association for the Advancement of Science. She is a recipient of many awards and prizes, including the Volhard Prize of the German Nephrological Society, the Alexander von Humboldt Scientific Exchange Award, and NIH Director's Awards for her role in the development of the Trans-NIH Type I Diabetes Strategic Plan and her leadership of the Trans-NIH Zebrafish Committee. From December 2011 to December 2012, Dr. Briggs was appointed acting director of the Division of Clinical Innovation at the National Center for Advancing Translational Sciences (NCATS), NIH, a position she held concurrently with the directorship of NCCAM. Dr. Briggs serves on a number of oversight and leadership boards at the NIH. She is a member of the NIH Steering Committee, the senior most governing board at the NIH, as well as the Advisory Board for Clinical Research, the Clinical Center Governing Board, and the Scientific Management and Review Board.

NCCAM DIRECTORS

Name	In Office from	To
William R. Harlan (Acting)	January 1999	October 1999
Stephen E. Straus	October 1999	November 2006
Ruth L. Kirschstein (Acting)	November 2006	January 2008
Josephine P. Briggs	January 2008	Present

PROGRAMS

The Center is organized into 9 major offices and divisions.

The Office of the Director plans, directs, coordinates, and evaluates the development of programs and activities of the Center. Within the Office:

- The *Office of Clinical and Regulatory Affairs* plans, coordinates, and monitors NCCAM's clinical trials, serving as a resource for investigators and helping to ensure the safety of trials; oversees the Center's Data Safety Monitoring Board; and ensures compliance with Institutional Review Board and U.S. Food and Drug Administration regulations.
- The *Office of Policy, Planning, and Evaluation* reports on NCCAM's scientific initiatives and programs, and oversees congressional testimony and the implementation of the Freedom of Information Act.
- The *Office of Communications and Public Liaison* handles activities pertaining to the dissemination of information about NCCAM and complementary and alternative medicine. Its work includes maintaining the Center's website, operating the Information Clearinghouse, serving as liaison with the media, and implementing education and outreach initiatives.
- The *Office of Administrative Operations* is responsible for financial management, administrative operations, and the design and implementation of innovative business and management systems.

The **Division of Extramural Activities** develops, implements, and coordinates extramural programs and policies within NCCAM. It also coordinates meetings of NCCAM's advisory council and manages the Center's committee management activities. Within the Division, two Offices have a specialized focus:

- The *Office of Scientific Review* coordinates the receipt, referral, and scientific review of grants, cooperative agreements, and research contracts.
- The *Office of Grants Management* oversees the processing of grant, cooperative agreement, and contract awards.

The **Division of Extramural Research** develops and oversees NCCAM-funded research and research training programs conducted across the country and around the world. The Division also coordinates research efforts with other NIH Institutes and Centers. Staff provide guidance regarding NCCAM research interests and priorities, and funding mechanisms and opportunities. Periodically, they offer grantsmanship workshops.

The **Division of Intramural Research** conducts basic, clinical, and translational research focusing on the role of the brain in perceiving, managing, and modifying pain. Within the Division, the Complementary and Integrative Medicine Consult Service offers clinical consultation to NIH Clinical Center staff, and the NCCAM Integrative Medicine Research Lecture Series provides overviews of current research and practice in the field.

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National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Recent Photos from the National Center for Complementary and Alternative Medicine (NCCAM)

2012 PHOTOS

Dr. David G.I. Kingston, Virginia Polytechnic Institute and State University, delivered the 2012 Stephen E. Straus Lecture in the Science of Complementary Health Therapies. (Photo Credit: Lisa Helfert)
lo-res | hi-res

M. Catherine Bushnell, Ph.D., was appointed scientific director of a new NIH research program based in the NCCAM Division of Intramural Research and focusing on the brain's role in pain. (Photo Credit: Lisa Helfert)
lo-res | hi-res

2011 PHOTOS

NCCAM's portal for health care providers was launched in 2011.
lo-res | hi-res

The Third Strategic Plan is guiding NCCAM from 2011 to 2015.
lo-res | hi-res

Sean Mackey, M.D., Ph.D., of Stanford University School of Medicine and the Stanford Systems Neuroscience and Pain Lab, delivered the 2011 Stephen E. Straus Lecture in the Science of Complementary and Alternative Medicine. Credit: Lisa Helfert
lo-res | hi-res

2009 PHOTOS

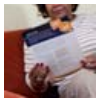
This figure shows total out-of-pocket U.S. spending in 2007 for conventional health care and CAM, for prescriptions versus natural products, and for visits to CAM practitioners versus visits to physicians. Out of the total $33.9 billion spent on CAM, an estimated $22 billion was for self-care—i.e., CAM products, classes, and materials—mostly in the form of natural products. The remaining $11.9 billion was for CAM practitioner visits. The $14.8 billion spent on natural products was about 1/3 of out-of-pocket spending on prescription drugs, and the $11.9 billion spent on CAM practitioner visits was about 1/4 of out-of-pocket spending on physician visits.

Credit: NCCAM
lo-res | hi-res

Poster for NCCAM's 10th Anniversary Symposium, *Exploring the Science of Complementary and Alternative Medicine*
lo-res | hi-res

2008 PHOTOS

NCCAM's "Time To Talk" campaign, launched in June 2008, encourages patients and their health care providers to openly discuss the use of



complementary and alternative medicine, to help ensure safe and coordinated care. Free toolkits (as pictured) are available. (Photo copyright Matt Fletcher)
lo-res | hi-res

Massage therapy appeared to ease pain and improve mood in the short term in a group of advanced cancer patients, according to findings from an NCCAM-funded study in 2008. The study, led by a University of Colorado Denver team at 15 U.S. hospices, found benefit also, to a lesser degree, from simple touch. (Photo copyright Bob Stockfield)
lo-res | hi-res

2007 PHOTOS

Participants discuss issues related to NCCAM and complementary and alternative medicine at an "NCCAM Stakeholder Dialogue" meeting, held at NIH in June 2007.
lo-res

This page last reviewed on February 12, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

National Center for Research Resources

Mission | Important Events | Legislative Chronology | Director | Programs | Photo Gallery

MISSION

For nearly 50 years, the National Center for Research Resources provided laboratory scientists and clinical researchers with tools and training to understand, detect, treat and prevent a wide range of diseases. NCRR supported all aspects of clinical and translational research, connecting researchers, patients and communities across the nation. This support enabled discoveries at a molecular and cellular level to move to animal-based studies to patient-oriented clinical research, ultimately leading to improved patient care.

IMPORTANT EVENTS IN NCRR HISTORY

1962—On April 13, U.S. Surgeon General Dr. Luther L. Terry announced the creation of the Division of Research Facilities and Resources (DRFR), officially established on June 15.

In June, the Regional Primate Research Centers were transferred from the National Heart Institute to DRFR.

1967—The Biotechnology Resources Program was established with the transfer of Centers for Biomedical Computing and Bioengineering to DRFR from another NIH component. BRP funded the first Centers in Mass Spectrometry and Nuclear Magnetic Resonance.

1969—DRFR, in the U.S. Public Health Service (PHS) Bureau of Health Professions Education and Manpower Training, was renamed the Division of Research Resources (DRR).

1970—DRR was removed from the Bureau of Health Professions Education and Manpower Training and became an independent NIH division.

1972—The Minority Biomedical Research Support Program was formed.

1975—The NIH Director approved a broadened mission for the division and an internal reorganization.

1979—The BRP funded the first synchrotron facility for use in X-ray crystallography by NIH investigators.

1980—The Minority High School Student Research Apprentice Program began.

1985—The Research Centers in Minority Institutions (RCMI) program was established.

The Biological Models and Materials Research Section was created in DRR's Animal Resources Program.

1986—The only national laboratory dedicated to biomedical applications of fluorescence was funded at the University of Illinois.

1987—The Pittsburgh Supercomputer Center was funded.

1988—The Research Facilities Improvement Program began.

1989—The Biological Models and Materials Resources Section of the Animal Resources Program became the Biological Models and Materials Research Program.

The Minority Biomedical Research Support Program was transferred from DRR to NIH's National Institute of General Medical Sciences.

1990—On February 15, Louis W. Sullivan, M.D., secretary of the U.S. Department of Health and Human Services, approved the merger of the Division of Research Resources and the NIH Division of Research Services to form the National Center for Research Resources.

NCRR received appropriated funding for the Research Centers in Minority Institutions (RCMI) program, which had been previously administered by DRR but funded by

the Office of the Director, NIH, since the program's inception in l985.

1991—The Science Education Partnership Award (SEPA) program was established.

1993—NCRR began the Science Teaching Enhancement Award program, a 2-year pilot program to create a corps of master teachers to form institutional partnerships that would improve biology education at the pre-college level.

The Institutional Development Award (IDeA) program and the Research Facilities Improvement Program were established, as mandated by the NIH 1993 Revitalization Act.

1994—NCRR convened expert biomedical investigators, academic administrators, and staff to develop NCRR's first comprehensive strategic plan, *NCRR: A Catalyst for Discovery, A Plan for the National Center for Research Resources.*

1995—NCRR reorganized the original seven extramural programs into: Biomedical Technology, Clinical Research, Comparative Medicine, and Research Infrastructure.

The Center established the Research Centers in Minority Institutions Clinical Research Infrastructure Initiative to enable RCMI-eligible institutions with affiliated medical schools to develop their clinical research infrastructure.

Three National Gene Vector Laboratories were established with joint funding from the NCRR; National Cancer Institute; National Heart, Lung, and Blood Institute; National Institute of Diabetes and Digestive and Kidney Diseases; and NIH Office of AIDS Research.

1996—An agreement was formalized between the NIH/NCRR Shared Instrumentation Grant program and the National Science Foundation's Multi-user Equipment Program to jointly review and fund single scientific instruments costing more than $500,000.

1997—NCRR's intramural programs were transferred to the NIH Division of Intramural Research Services within the NIH Office of Research Services.

The *NCRR Reporter,* a quarterly magazine formerly published by DRR as the *Reporter,* celebrated its first 20 years of publication.

1998—A comprehensive five-year strategic plan, *NCRR—A Catalyst for Discovery—A Plan for the National Center for Research Resources: 1998-2003,* was published.

NCRR established the NIH Chimpanzee Management Program.

1999—NCRR established the nation's eighth Regional Primate Research Center at the Southwest Foundation for Biomedical Research—the first center to be added to the RPRC network since the 1960s.

NCRR established the Mutant Mouse Regional Resource Centers (MMRRC) program.

Eight "collaboratory" projects were initiated within the NCRR-supported Biomedical Technology Resource Centers to demonstrate and evaluate the efficiency and effectiveness of conducting multi-investigator research utilizing the Internet.

A full-scale biosafety level-4 (BL4) laboratory—partially funded by NCRR—was dedicated at the Southwest Foundation for Biomedical Research in Texas. It is 1 of 4 federally supported BL4 labs nationwide, but the only such facility dedicated to basic molecular studies and investigation of long-term pathogenesis of deadly microbes.

2000—As part of the IDeA program, NCRR established Centers of Biomedical Research Excellence at independent institutions located in states with historically low aggregate success rates for obtaining NIH grants. The COBRE support thematic multidisciplinary centers that augment and strengthen institutional biomedical research capacity.

2001—NCRR launched the Biomedical Informatics Research Network, a shared network of neuroimaging databases that serves as a test bed for development of hardware, software and protocols for mining data in a site-independent manner for both basic and clinical research.

The first NIH-wide High-End Instrumentation grant program was established to enable institutions to purchase instruments that cost more than $1 million.

NCRR began providing Science Education Partnership Awards (SEPA) to science centers and museums nationwide to enhance the reach of unique health-related education programs.

2002—NCRR, along with five other NIH components, issued infrastructure enhancement awards to increase the capacity for basic research using human embryonic stem cells for preclinical investigations. The awards, which support entities listed on the NIH Human Embryonic Stem Cell Registry, were designed to increase the supplies and access to self-renewing cells that are well characterized for quality controls.

A private, nonprofit organization received a contract to establish and operate a sanctuary for chimpanzees no longer needed for biomedical research. The Chimpanzee Health Improvement, Maintenance, and Protection Act of December 2000 mandated such a sanctuary.

The eight Regional Primate Research Centers were renamed as National Primate Research Centers (NPRCs) to reflect their enhanced emphasis on providing nonhuman primates and related resources to biomedical scientists nationwide.

The Rat Resource and Research Center (RRRC), established at the University of Missouri (Columbia), serves as a resource for the study of rat models for biomedical research worldwide. The RRRC imports, cryopreserves, produces, and distributes high-quality laboratory rats.

2003—To address the challenges inherent in diagnosing and treating rare diseases, NCRR and other NIH components established the Rare Disease Clinical Research Network, which consists of 7 Rare Diseases Clinical Research Centers and a Data and Technology Coordinating Center. Each research center consists of a consortium of clinical investigators partnering with patient-support groups and institutions within and outside of the United States that have agreed to work together studying a group of rare diseases.

NCRR and the NIH National Center on Minority Health and Health Disparities (NCMHD) awarded a grant to Tuskegee University to complete its National Center for Bioethics in Research and Health Care. The grant allows the university to provide research and teaching facilities for faculty, researchers, and visiting scholars for studies in bioethics, public health, and integrated bioscience programs. The Center is the nation's first bioethics institute dedicated to addressing issues that involve African Americans and other vulnerable or disadvantaged populations.

IDeANet (an Internet-based network providing connectivity for high-bandwidth science applications. IDeANet enables collaboration among institutions) began with the funding of a test-bed consortium of six IDeA states (called the Lariat Project) to provide increased connectivity for high-bandwidth science applications and facilitate collaborations among these and other institutions. IDeANet enhances IT infrastructure by providing support for staff in bioinformatics and data management cores, computer hardware and software, and Internet2 broad-bandwidth access for biomedical applications. It was intended to relieve strategic bottlenecks in connectivity entering states and to improve Internet performance at many sites throughout the IDeA states.

The Division of Comparative Medicine funded 3 new resource centers. A Viper Resource Center was established at Texas A&M University in Kingsville, Texas, to provide a resource of more than 400 venomous snakes. A National Swine Research and Resource Center was established at the University of Missouri-Columbia to serve as a national repository and distribution center for genetically modified swine. The Drosophila Genomics Resource Center, housed at the Center for Genomics and Bioinformatics at Indiana University in Bloomington, Ill, was created to assist researchers in applying genomics in the model organism *Drosophila* by assuring economical access to quality-controlled genomics materials.

Three new resources were developed to integrate technologies that enhance the study of proteomics and glycomics, two emerging fields that seek to identify and uncover the structures, functions, and interactions of the thousands of proteins (proteomics) or carbohydrates (glycomics) found in cells. The new resources were the Proteomics Research Resource for Integrative Biology at Pacific Northwest National Laboratory, Integrated Technology Resource for Biomedical Glycomics at the University of Georgia, and the Integrated Proteome Technologies for Pathway Mapping resource at the University of Michigan, which houses a high-throughput robotic analysis system.

Tulane University, in New Orleans, established a center for the preparation, quality testing, and distribution of adult stem cells. Using standardized protocols, the center prepares and distributes a continuous supply of marrow stromal cells derived from adult human and rat bone marrow.

2004—A comprehensive five-year strategic plan, *2004-2008 Strategic Plan: Challenges and Critical Choices,* was published, based on the input of biomedical investigators, senior administrators in research organizations, scholarly organizations and NIH senior program staff. The Strategic Plan guided NCRR's priorities for investments, including local and national networks, research resources, technology development, instrumentation, biological models, and biomedical informatics tools to facilitate research intended to prevent, alleviate, or treat human disease.

Using existing resources and centers, NCRR began serving as a significant partner in many NIH Roadmap initiatives, including those under the theme of Re-engineering the Clinical Research Enterprise. NCRR was the lead Center partnering with other NIH components to support Exploratory Centers for Interdisciplinary Research. NCRR was also the lead NIH component supporting National Technology Centers for Networks and Pathways. Additionally, NCRR supports the National Centers for Biomedical Computing initiative.

Comprehensive Centers on Health Disparities were established to systematically address one or more of the health disparities that negatively impact racial and ethnic minority populations served by the grantee institutions. The new centers are: Meharry Medical College in Nashville; Charles R. Drew University of Medicine and Science in Los Angeles; and the Puerto Rico consortium, which consists of the 3 accredited medical schools in Puerto Rico (the University of Puerto Rico School of Medicine, the Universidad Central del Caribe School of Medicine, and the Ponce School of Medicine.) The health disparities to be studied include a variety of cancers (breast, prostate, and colorectal); diabetes mellitus; renal disease; infant mortality; AIDS; and cerebrovascular and cardiovascular diseases.

2005—The Research Centers in Minority Institutions program celebrated its 20th anniversary. Launched in 1985 with Congressional support, the RCMI program fosters environments that are conducive to excellence in basic, clinical and behavioral research. Through training and career development opportunities, the RCMI program also establishes a critical mass of scientists that more closely reflect the growing ethnic and cultural diversity of the U.S. population.

The WiCell Research Institute in Wisconsin was awarded $16.1 million over four years to fund a National Stem Cell Bank. The Bank will consolidate many of the federally funded eligible human embryonic stem cell lines in one location, reduce the costs that researchers have to pay for the cells, and maintain quality control over the cells. The Stem Cell Bank provides scientists affordable and timely access to federally approved human embryonic stem cells and other technical support that will make it easier for scientists to obtain the cell lines currently listed on the NIH Human Embryonic Stem Cell Registry.

Chimp Haven, the first federally funded chimpanzee sanctuary, opened on October 28, 2005. The sanctuary, funded by an NCRR contract, provides lifetime care for federally owned or supported chimpanzees that are no longer needed for biomedical research. NCRR also awarded construction grants so that Chimp Haven could develop and build a state-of-the-art facility that closely resembles the chimpanzees' natural habitat. The sanctuary was established in response to the Chimpanzee Health Improvement, Maintenance, and Protection Act of December 2000, which authorized $30 million in federal dollars for the sanctuary.

2006—The Clinical and Translational Science Awards program was launched to form a national consortium of research institutions that work together to transform the discipline of clinical and translational science. Led by NCRR, the CTSA Consortium was initiated through funding to 12 academic health centers located throughout the nation. An additional 52 awardees received planning grants to help them prepare applications to join the consortium. When fully implemented, the consortium will support approximately 60 CTSAs. CTSA Consortium members share a common vision to reduce the time it takes for laboratory discoveries to become treatments for patients, to engage communities in clinical research efforts, and to train a new generation of clinical and translational researchers.

By encouraging collaboration across disciplines, CTSA consortium members use innovative approaches to tackle research challenges and train clinical and translational researchers. As a direct result of the CTSA program, researchers are working together in new ways to advance medical research across many disease areas and conditions, including cancer, neurological disorders, cardiovascular disease, diabetes and obesity. The CTSA Consortium's Web site (CTSAWeb.org) helps to ensure access to CTSA resources, to enhance communications and to encourage information sharing.

The Rare Diseases Clinical Research Network, an initiative of the NIH Office of Rare Diseases and NCRR—in collaboration with many NIH Institutes, facilitates clinical research of rare diseases. More than 20 studies opened at approximately 50 sites across the United States and in several other countries including the United Kingdom, Japan, and Brazil. The network has received five-year funding awards totaling $71 million.

NIH also awarded a set of cooperative agreements, totaling up to $52 million over five years, to launch the Knockout Mouse Project. The goal of this program was to build a comprehensive and publicly available resource of knockout mutations in the mouse genome. NCRR was one of the 19 NIH Institutes, Centers and Offices contributing to the Knockout Mouse Project.

2007—In April, NIH Director Elias A. Zerhouni, M.D., named Barbara Alving, M.D., M.A.C.P., as the director of NCRR. Dr. Alving joined NIH in 1999. She previously served as acting director of NCRR as well as NHLBI.

In September, NCRR expanded the CTSA consortium from 12 to 24 academic health centers. The consortium's major goal is to speed the translation of laboratory discoveries into treatments for patients. Currently, the CTSA consortium is working to address three major priorities: standardizing clinical research informatics, streamlining institutional review board processes, and developing national curricula for clinical and translational science. When fully implemented in 2012, 60 institutions will be linked together to energize the discipline of clinical and translational science. View Image.

Scientists have now added a third primate to the list of sequenced genomes: the rhesus macaque, *Macaca mulatta.* This old-world monkey is the nonhuman primate most widely used in biomedical studies focusing on major diseases, such as AIDS and diabetes. Its genome sequence is reported in the April 13, 2007, issue of *Science*. The sequencing, funded by NIH's National Human Genome Research Institute, was performed at the Baylor College of Medicine Human Genome Sequencing Center in Houston; the Genome Sequencing Center at Washington University in St. Louis; and the J. Craig Venter Institute in Rockville, Md. It was based on the DNA from a single individual—a female rhesus macaque housed at the NCRR-funded NPRC at the Southwest Foundation for Biomedical Research in San Antonio. The California, Oregon and Yerkes NPRCs, also funded by NCRR, contributed additional biological samples used in the study. View Image.

NCRR provided $9.5 million over three years to launch a Translational Research Network that will increase the opportunity for multi-site clinical and translational research among minority and other collaborating institutions throughout the nation. Investigators at these institutions are focused on cancer, diabetes, renal disease, infant mortality, HIV/AIDS and cardiovascular diseases—all of which disproportionately affect minority populations.

Researchers at the Oregon Health and Science University's NPRC—funded by NCRR—made a significant breakthrough in efforts to develop human stem cell therapies to combat devastating diseases. For the first time, scientists successfully derived embryonic stem cells by reprogramming the genetic material of skin cells from rhesus macaque monkeys. Related future studies will have the potential to accelerate progress in regenerative medicine.

A team of University of Wisconsin-Madison researchers led by Dr. James Thomson reported the genetic reprogramming of human skin cells to create cells apparently indistinguishable from embryonic stem cells. This alternative to the embryo-based cloning technique shows that human skin cells can be reprogrammed into so-called induced pluripotent stem (iPS) cells that look and act like embryonic stem cells. These iPS cells could be used to generate patient-specific stem cells. Using this new reprogramming technique (inserting viral genes into adult human skin cells), the Wisconsin group developed eight new stem cell lines.

NCRR released a multimedia presentation—*Harnessing Innovation to Advance Human Health*—that provides an overview of the Center's mission, grant programs and resources.

2008—The *NCRR Strategic Plan 2009-2013: Translating Research from Basic Discovery to Improved Patient Care*, was published. This comprehensive five-year strategic plan reflects extensive discussions and advice from a broad spectrum of individuals, including biomedical scientists, senior administrators in research institutions, members of professional organizations, and NIH senior program staff. Implementation of the plan requires that NCRR continue to develop and explore creative ways to partner with other federal government agencies and additional organizations, both public and private. NCRR also will continue to enlist the help of researchers and administrators across the biomedical research community to ensure successful implementation of the plan and its continued evolution in response to new challenges and discoveries.

Fourteen academic health centers in 11 states became the newest members of the National Institutes of Health's CTSA consortium. These 14 centers joined 24 others announced in 2006 and 2007. Creating a unique network of medical research institutions across the nation, the consortium works to reduce the time it takes for laboratory discoveries to become treatments for patients and to engage communities in clinical research efforts. The 2008 CTSA grants expanded state representation in the consortium to Alabama, Colorado, Indiana, Massachusetts and Utah. They also supported pediatric research at 13 dedicated children's hospitals, expanded research in genetics and genomics, enhanced research in behavioral immunology and infection risk, and increased outreach into local communities. View Image.

CTSA institutions have formed regional networks within the national consortium. Such networks have formed on the West Coast, in the Midwest, and on the East Coast, improving collaboration between CTSA institutions in these areas. These regional alliances also provide opportunities to cultivate equitable and collaborative partnerships between regional communities and the CTSA institutions, create new ways to disseminate information about research findings, and conduct research that leads to measurable improvements in community health.

CTSA networks also are building partnerships with other NCRR programs—such as the Institutional Development Awards and the Research Centers in Minority Institutions programs—through research collaborations, visiting professorships, working groups, and sharing and leveraging resources and infrastructure. The goal is to extend the CTSA philosophy of interdisciplinary interactions and connectivity to generate partnerships and collaboration beyond the consortium to organizations involved with health care throughout the nation. These partnerships enable scientists to expand research opportunities and to share their expertise and resources to

further advance clinical and translational research.

Scientists developed the first genetically altered monkey model that replicates some symptoms observed in patients with Huntington's disease, according to a new study funded by NCRR. Researchers are now able to better understand this complex, devastating and incurable genetic disorder affecting the brain. This advance, reported in the May 18 advance online edition of *Nature,* could lead to major breakthroughs in the effort to develop new treatments for a range of neurological diseases. View Image.

NCRR funded five new IDeA grants over the next five years. The awards support multidisciplinary centers that strengthen institutional biomedical research capability and enhance research infrastructure. The IDeA program is designed to improve the competitiveness of investigators in states that historically have not received significant levels of competitive NIH research funding. The new centers are being established at the University at Hawaii, Manoa to study reproductive biology; University of Kentucky to identify mechanisms linking the epidemic of obesity to cardiovascular disease; University of Louisville Research Foundation, Inc., to study the cardiovascular causes and consequences of diabetes and obesity; University of Nebraska Medical Center to research nanomedicine, drug delivery, therapeutics and diagnostics; and The Mind Research Network, a nonprofit research organization in Albuquerque, N.M., to study the neural mechanisms of schizophrenia.

2009—Under the American Recovery and Reinvestment Act (ARRA) of 2009, NCRR provided the following funding opportunities: $1 billion for extramural core facilities and other construction, renovation or repair; $300 million in high-end and shared instrumentation awards; approximately $200 million in Challenge Grants in health and science research; and approximately $215 million in Administrative Supplements, including $15 million to support core facilities consolidation. View Image.

NCRR's Recovery Act awards included $27 million to the University of Florida and Harvard University Medical School to harness the power of social networking. This initiative is bringing the power of Internet-based tools, as exemplified by social networking, to biomedical research. These modern technologies for communication and collaboration have the potential to enhance interdisciplinary research by enabling individuals to connect with each other and with resources irrespective of location to address challenges in new ways.

Clinical and Translational Science Awards (CTSAs) were made to eight additional academic health centers, bringing the consortium to 46 member institutions. This national network of medical research institutions works to reduce the time it takes for laboratory discoveries to become treatments for patients, to engage communities in clinical research efforts and to train clinical and translational researchers. NCRR also released the first *CTSA Progress Report 2006 – 2008,* which outlines the impact of the CTSA program in its first two years. View Image.

NCRR announced ResearchMatch.org, a not-for-profit, free, secure Web site designed to provide people who are interested in participating in research the opportunity to be matched with studies that may be the right fit for them. A collaborative effort of the national network of medical research institutions affiliated with the CTSAs, the site is the first disease-neutral, volunteer recruitment registry.

NCRR awarded $8.5 million through 18 grants to 17 CTSA institutions to support studies of pharmaceutical treatments for children. The funding supports studies that focus on three areas critical to health (pediatric cardiology, neonatology and pediatric neurology) and is part of NIH's continuing efforts in studying drugs for use in pediatric populations.

Researchers at the Center for Functional Imaging Technologies at Massachusetts General Hospital —an NCRR-supported Biomedical Technology Research Center (BTRC)—created a powerful MRI brain-scanning instrument that it can detect the tiniest of lesions, even those as small as blood vessels. The instrument uses dozens of overlapping coils that pick up the MRI signal, all built into a helmet that fits closely to the patient's head. The Center for Functional Imaging Technologies is one of more than 50 NCRR-funded BTRCs across the United States that enable researchers to develop and distribute new technologies and methodologies. View Image.

NCRR's support of its Institutional Development Award program in 2009 included $274 million over the next five years for IDeA Networks of Biomedical Research Excellence (INBRE) in 16 IDeA-eligible states. In addition, NCRR granted $137.4 million for its IDeA Centers of Biomedical Research Excellence (COBRE) program, including $20.4 million for two new COBREs in Rhode Island and South Carolina. The IDeA program fosters health-related research and enhances the competitiveness of investigators at institutions located in states in which the aggregate success rate for applications to NIH historically has been low. The program also serves unique populations—such as rural and medically underserved communities—in these states.

Through the Research Centers in Minority Institutions (RCMI) program, NCRR awarded $75 million to support four institutions over the next five years. Three of the four institutions will receive funding through a new program, the RCMI Infrastructure for Clinical and Translational Research (RCTR). The fourth grant establishes a new RCMI center at Xavier University of Louisiana. The three institutions receiving RCTR awards are Charles R. Drew University of Medicine and Science (Los Angeles), Meharry Medical College (Nashville) and Morehouse School of Medicine (Atlanta).

NCRR awarded an estimated total of $19.2 million along—with nearly $1.4 million in funding from the National Institute of Environmental Health Sciences—to fund 17 Science Education Partnership Awards. The awards provide two to five years of grant support to stimulate scientific curiosity and encourage hands-on science education activities among students in kindergarten through 12th grade. The grants support partnerships among scientists, educators, museums and community organizations to encourage choosing science as a career path and to improve public understanding of NIH-funded biomedical research. View Image.

2010—As mandated by the American Recovery and Reinvestment Act of 2009, NCRR continued to administer and award funding for construction, instrumentation and biomedical research activities to advance human health.

Research institutions across the nation will use NCRR-administered Recovery Act construction funds to help advance studies in disease areas such as cancer, HIV/AIDS, autism, pediatric illnesses and other health disorders. For example, the awards include nearly $8.5 million to create a state-of-the-art facility for pediatric clinical research at the Indiana University School of Medicine; $14.3 million to build a world-class data center at the Washington University School of Medicine to support human genome research; $9.5 million to enable the San Francisco Department of Public Health to increase its capacity to recruit research participants and to provide critical data to HIV/AIDS researchers worldwide; and $9.5 million to Rutgers University to broaden the scope of its molecular biology services.

Recovery Act instrumentation grants included $7.8 million to the University of Minnesota, Minneapolis, to purchase components for a 10.5 Tesla whole-body magnetic resonance imaging system; $8 million to researchers at the University of Maryland, Baltimore, to purchase a powerful 950 megahertz nuclear magnetic resonance spectrometer; and $215,000 to investigators at the University of Washington, Seattle, to develop a multicolor total internal reflection fluorescence microscope, enabling them to examine cell division in greater detail.

The North East Cyberinfrastructure Consortium, established in part with NCRR Recovery Act funding, began work on determining the genome sequence of the little skate (Leucoraja erinacea) — one of 11 non-mammalian organisms strategically selected for sequencing by an NIH National Human Genome Research Institute advisory panel because the skate shares characteristics with the human immune, circulatory and nervous systems.

In addition to its Recovery Act grants, NCRR made Clinical and Translational Science Awards (CTSAs) to nine academic health centers, increasing the CTSA consortium membership to 55 institutions. This national network of medical research institutions works to reduce the time it takes for laboratory discoveries to become treatments for patients, to engage communities in clinical research efforts, and to train clinical and translational researchers. The 2010 CTSAs expanded consortium representation to new areas including New Mexico, Virginia and the District of Columbia.

A website created by University of Washington researcher Eric Chudler, with funding from an NCRR Science Education Partnership Award (SEPA), won the Science Prize for Online Resources in Education. The prize recognizes exceptional online materials that are available free of charge to science educators. The website, "Neuroscience for Kids," provides some 150 million file downloads each year.

With pilot funding from the Northwestern University Clinical and Translational Sciences Institute, supported through the CTSA program, researchers studied sticky proteins produced by the foot of the common mussel (Mytilus edulis). Northwestern University researcher Phillip Messersmith developed synthetic materials mimicking these proteins that can stick to different surfaces even in wet environments. Messersmith tested these mussel-based "glues" to repair tears that occur in amniotic sacs, a complication of some pregnancies. View Image.

At NCRR-funded Biomedical Technology Research Centers, interdisciplinary teams created unique, transformative technologies and promoted their widespread use. During the past decade, University of California, Irvine, biomedical engineering professor Bruce Tromberg has been developing a device that uses thousands of colors of low-energy light to look at breast cancers in a new way. This noninvasive device, called a Laser Breast Scanner, conducts noninvasive, functional imaging of breast tumors and may help to improve cancer treatment while also lowering health care costs.

Researchers led by Chris Johnson at the University of Utah's NCRR-supported Center for Integrative Biomedical Computing developed an iPhone application that is changing how and where doctors practice medicine. The ImageVis3D Mobile visualization program enables them to retrieve and view high-resolution 3-D medical images on their mobile phones. View Image.

NCRR also funded the development of genetically engineered rodents and research rodent colonies. A research team led by Qi-Long Ying at the University of Southern California demonstrated that a gene-targeting mutation in rat embryonic stem cells can be transmitted through the germline to produce rats with the same mutation, providing a powerful new approach for creating models to study gene function relevant to human diseases. View Image.

At the University of Wisconsin, Madison, NCRR veterinary career development participant Rebecca Johnson studied rat models of diseases that affect myelin, such as Multiple Sclerosis. Severely affected MS patients often suffer from complications in breathing, but the cause is unclear. By studying rats that lack myelin in the brain and spinal cord, Johnson discovered that these animals have abnormalities in central nervous system signals that cause the diaphragm to contract and draw air into the lungs, which in turn may explain relationships between myelin disorders and breathing control in humans. View Image.

NCRR IDeA Networks of Biomedical Research Excellence (INBRE) researchers at the National Center for Genome Resources in Santa Fe, N.M., and their collaborators from the University of California at San Francisco; Stanford Medical School, Calif.; Wayne State Medical School, Mich.; Illumina Inc.; and Genentech, integrated state-of-the-art next generation DNA sequencing and analysis technologies to compare genes, gene activity and methylation gene controls associated with Multiple Sclerosis. Their work underscored the potential significance of environmental exposures and other non-genetic factors in complex disorders.

2011—NCRR made new Clinical and Translational Science Awards (CTSAs) to five academic health centers, increasing the CTSA consortium membership to 60 institutions. This national network of medical research institutions supports the innovation and partnerships necessary to bridge the traditional divides between basic research and medical practice.

With NCRR support from the Weill Cornell Clinical and Translational Science Center (CTSC), Michelle Bradbury, a clinician-scientist at Memorial Sloan-Kettering Cancer Center, and her collaborators have taken C-dots through federal regulatory approvals and into their first ever clinical study with melanoma patients. Innovative research funding and a diverse team of experts at both the cancer center and Cornell University helped to facilitate her research and expedite the protocol process. Bradbury is hopeful that imaging cancer tumors with C-dots could one day help surgeons better identify metastatic disease, define tumor margins and provide targeted tumor therapy — all in one platform.

NCRR electronically published the Clinical and Translational Science Awards Progress Report 2009 – 2011 Foundations for Accelerated Discovery and Efficient Translation. This report illustrates how the CTSA-funded institutions are supporting discoveries for health at the local, regional and national levels.

Vanderbilt University Medical Center was awarded a five-year, $20 million federal grant to coordinate the Clinical and Translational Science Awards Consortium. The CTSA Consortium has generated resources that enhance the efficiency and quality of clinical and translational research, such as a searchable database of potential industry partners to aid scientists seeking public-private partnerships to take their research hto the next level. Another example is a secure Web application designed to assist scientific teams with research data collection, sharing and management.

NCRR provided approximately $31.8 million to fund 18 Science Education Partnership Awards (SEPAs). SEPAs provide two to five years of support to stimulate scientific curiosity and encourage hands-on science education activities. By supporting interactions among scientists, educators and community organizations, the SEPA program helps improve public understanding of NIH-funded medical research and encourages the participation of young people in science careers.

NCRR provided $2.5 million to the National Center for Image-Guided Therapy at Brigham and Women's Hospital and Harvard Medical School to develop the Advanced Multimodality Image Guided Operating (AMIGO) Suite, a one-of-a-kind surgical facility combining real-time imaging of X-ray fluoroscopy and ultrasound with computed tomography (CT), magnetic resonance imaging (MRI) and positron emission tomography (PET). AMIGO enables radiologists, surgeons, engineers, computer scientists and physicists to work together to introduce, test and perfect cutting-edge surgical procedures for a wide range of diseases. Surgical teams already have used the suite for minimally invasive brain tumor surgery as well as prostate and renal biopsies.

NCRR awarded five-year grants to the University of California, San Diego, and Vanderbilt University to develop two new Biomedical Technology Research Centers (BTRCs). These BTRCs provide researchers with access to specialized tools, training and equipment. The National Resource for Network Biology is funded by a $6.5 million grant to the University of California, San Diego, and directed by Trey Ideker. This resource is developing bioinformatic tools to visualize complex biological networks and to model their function. The new National Resource for Imaging Mass Spectrometry, funded by a $10 million grant to Vanderbilt University and headed by Richard Caprioli, develops new technologies and methods for in situ mass spectrometry directly from tissue sections.

Using an advanced Shared Instrumentation Grant-funded Flow Cytometer, researchers at Uniformed Services University of the Health Sciences have discovered cell cycle abnormalities associated with Adult T-Cell Leukemia/Lymphoma. These changes can be partially reversed in vitro using an anti-tumor agent. This work, which was published in the Journal of Virology in March 2011, may lead to new therapies.

Researchers at the NCRR-supported National Resource for Mass Spectrometric Analysis of Biological Macromolecules, a BTRC at Rockefeller University, discovered a potential HIV vaccine target. Passive transfer of broadly neutralizing HIV antibodies can prevent infection. This suggests that vaccines eliciting such antibodies would be protective. In the September 2011 issue of Science, the Rockefeller team identified broad and potent antibodies that mimic CD4 binding. CD4 provides a way for HIV to access host T-cells and a potential vaccine target.

Immunologist Louis Picker and a team of investigators at the Oregon Health & Science University developed a new vaccine strategy for HIV in nonhuman primates. The vaccine strategy uses a benign, yet ever-present virus called cytomegalovirus (CMV) to carry HIV's unique proteins. To develop the vaccine, Picker worked in the rhesus monkey model of HIV at the NCRR-funded Oregon National Primate Research Center. By continuing to leverage the primate center's resources, Picker ultimately hopes to develop a human version of the vaccine. Results of this research were published in the May 26, 2011 issue of Nature.

James A. Thomson directed the group at the NCRR-funded Wisconsin National Primate Research Center that isolated embryonic stem cell lines from rhesus and marmoset monkeys in 1995 and 1996. He then led his group to the successful isolation of human embryonic stem cell lines in 1998. For this work, Thomson was named winner of the 2011 Albany Medical Center Prize, which he shares with Elaine Fuchs, a Howard Hughes Medical Institute researcher at Rockefeller University, and Shinya Yamanaka of Kyoto University.

NCRR-funded researcher Pierre Comizzoli of the Smithsonian Institution received a Presidential Early Career Award for Scientists and Engineers for his innovative fertility work in September 2011. He has been investigating innovative processes relating to fertility — including methods for isolating and drying the DNA of egg cells, which is a less expensive and easier alternative to freezing and preserving the entire egg. His work, funded by NCRR, could someday be used not only to extend human fertility but also to save endangered species.

John Postlethwait, researcher and professor of biology at the University of Oregon Institute of Neuroscience, and his team screened thousands of drug candidates for activity against mutations that cause Fanconi anemia (FA), a rare genetic blood disease. With NCRR support, they developed a model system in zebrafish that carries the human genes for FA and exhibits structural changes that parallel some of those found in humans with the disease.

Supported by NCRR's Institutional Development Award Centers of Biomedical Research Excellence program, Elena Batrakova strives to get drugs past the brain's protective blood barrier using nanoparticles. Nanoparticle-based drug delivery systems form the crux of nanomedicine — applying the technology of extremely small engineered particles to improve medicine — and have been particularly useful for targeting chronic diseases. For her Parkinson's research, she used macrophages to deliver nanozymes that destroy inflammation-causing free radicals behind the blood-brain barrier in mice. Using the resources of the NCRR-supported University of Nebraska's Center for Drug Delivery and Nanomedicine, Batrakova's Parkinson's disease mouse model holds promise for the human disorder as well as other neurodegenerative diseases.

NCRR-supported investigator Emily Scott, an associate professor of medicinal chemistry at the University of Kansas, received national recognition for her innovative research. Scott conducts pioneering research on the structure and function of membrane cytochrome P450 enzymes, which are proteins responsible for breaking down drugs and other foreign chemicals in the body. For this work, the Drug Metabolism and Disposition Division of the American Society for Pharmacology and Experimental Therapeutics selected Scott for its 2011 Early Career Achievement Award. Scott's research, which received early support from NCRR, examines how the shapes and chemical features of these enzymes influence which drugs and chemicals they can break down. These findings help us understand how chemical toxicity works and someday could contribute to a new therapy to prevent lung cancer in tobacco users.

Paul Tchounwou and his team at Jackson State University's Center for Environmental Health, funded by NCRR's Research Centers in Minority Institutions (RCMI) program, studied the effects of a chemotherapy drug called arsenic trioxide and the immune booster vitamin C as a therapy for acute promyelocytic leukemia (APL). People with APL produce abnormal white blood cells that never mature and that accumulate in the bone marrow, crowding out normal cells. Patients suffer from decreased red blood cell production, which causes them to feel tired and weak; they also bruise easily and are more susceptible to infections. Tchounwou's therapy enables doctors to identify APL by a characteristic genetic change that affects a cellular protein that recognizes vitamin C.

RCMI-funded Morehouse School of Medicine microbiologist Jonathan Stiles discovered a way to detect Plasmodium falciparum — the parasite responsible for human malaria — without the need for blood. Focusing instead on saliva, he and his research team developed a noninvasive way to detect Plasmodium antigens, telltale signs of the parasite's presence. This finding has the potential to one day revolutionize malaria screening efforts in resource-poor countries.

NCRR LEGISLATIVE CHRONOLOGY

July 30, 1956—The Health Research Facilities Act of 1956 (Title VII of the Public Health Service act) authorized a PHS program of federal matching grants to public

and nonprofit institutions for the construction of health research facilities. Congress extended title VII through 1971. No grants were made under this authority after 1969.

August 19, 1959—Congress appropriated $2 million to establish two primate research centers.

September 15, 1960—Public Law 86-798 amended the PHS act to authorize grants-in-aid to universities, hospitals, laboratories, and other public and nonprofit institutions to strengthen their programs of research and research training in sciences related to health. The act also authorized the use of funds appropriated for research or research training to be set aside by the Surgeon General in a special account for general research support grants. Passage of this law resulted in the Biomedical Research Support Program.

July 29, 1971—The Minority Biomedical Research Support Program was created with $2 million from the Senate Appropriations Committee under authority of sec. 301(c) of the amended PHS act.

October 3, 1984—The Research Centers in Minority Institutions program was created with a $5 million congressional appropriation to the NIH Office of the Director. DRR was given administrative authority for the program.

December 22, 1987—Public Law 100-202 provided $23.9 million for the "repair, renovation, modernization and expansion of existing research facilities, and for the purchase of associated equipment." The accompanying report, H.R. 100-498, directed that the money be spent on improving AIDS research facilities. The Research Facilities Improvement Program was created in DRR in response to this legislation.

November 6, 1990—Public Law 101-613, NIH Revitalization Act of l990, mandated new programs, specified program funding levels, and reauthorized existing activities.

June 10, 1993—Public Law 103-43, NIH Revitalization Act of l993, provided the statutory authority to redesignate DRR as NCRR and the authority to fund construction of biomedical and behavioral research facilities, with a special provision for centers of excellence and regional centers for research utilizing nonhuman primates. It also authorized the Institutional Development Award program, which supports programs in states that historically have been unsuccessful in competing for NIH grants.

November 13, 2000—The Clinical Research Enhancement Act of 2000, which is Title II of the Public Health Improvement Act [Minibus] (P.L. 106-505), provided the NCRR director with statutory authority to award grants for the establishment of GCRCs. The bill also required the NIH director to establish a Loan Repayment Program to encourage recruitment of new clinical investigators and to award grants that will enhance clinical research career development.

November 13, 2000—The Twenty-First Century Research Laboratories Act, which is Title III of the Public Health Improvement Act [Minibus] (P.L. 106-505), authorized $250 million for FY 2001 to the NCRR director to make grants or contracts to public and nonprofit private entities to expand, remodel, renovate, or alter existing research facilities or to construct new research facilities, including centers of excellence. It also authorized such sums as necessary for FY 2002 and FY 2003. In addition, the Act created, in statute, a specific authorization for NCRR's Shared Instrumentation Grant program, authorizing $100 million for FY 2000 and such sums as necessary for subsequent fiscal years.

December 20, 2000—The Chimpanzee Health Improvement, Maintenance, and Protection Act (P.L. 106-551) required NIH to enter into a contract with a nonprofit private entity for the purpose of operating a sanctuary system for the long-term care of chimpanzees that are no longer needed in research conducted or supported by the federal government. The law provides for standards for permanent retirement of chimpanzees into the system, including prohibiting using sanctuary chimpanzees for research except in specified circumstances.

January 15, 2007—President George W. Bush signed into law the NIH Reform Act of 2006. Of specific importance to NCRR, the legislation enhances the Clinical and Translational Science Awards by requiring the establishment of a mechanism to preserve independent funding and infrastructure for pediatric clinical research centers.

December 26, 2007—President Bush signed into law P.L. 110-170, the Chimp Haven is Home Act. Provisions modified the program for the sanctuary system for surplus chimpanzees by terminating the authority for the removal of chimpanzees from the system for research purposes.

February 17, 2009—President Obama signed into law P.L. 111-5, the American Recovery and Reinvestment Act. Provisions included $1 billion for NCRR's Extramural Construction program, $300 million for NCRR's Shared Instrumentation Grant program, and approximately $300 million for NCRR's biomedical research priorities.

December 23, 2011— President Obama signed into law P.L. 112-74, the Fiscal Year 2012 Consolidated Appropriations Act. As part of this legislation, the National Center for Research Resources (NCRR) was dissolved and its' programs were re-assigned to the following NIH Institutes and Centers:

National Center for Advancing Translational Sciences

- Clinical and Translational Science Awards
- Related Small Business (SBIR/STTR) Grants

NIH Office of the Director, Division of Program Coordination, Planning and Strategic Initiatives, Office of Research Infrastructure Programs

- All Division of Comparative Medicine Programs
  - Nonhuman Primate Resources
  - Vertebrate and Invertebrate Animal Resources
  - Genetic, Biological and Other Resources

- Human Tissue and Organ Resource for Research
- Career Development

- Extramural Construction
- Research and Animal Facilities Improvement
- Shared and High-End Instrumentation Grants
- Science Education Partnership Awards
- Related Small Business (SBIR/STTR) Grants

National Institute of Biomedical Imaging and Bioengineering

- Imaging and Point-of-Care Diagnostics Biomedical Technology Research Centers
- Investigator-Initiated Research Grants for Technology Research and Development
  - R21 Instrument Development Grants Specific to Imaging and Poinre Diagnostics
  - Small Business Grants Related to Imaging and Point-Of-Care Diagnostt-of-Care Diagnostics
  - All Other Research Project Grants Related to Imaging and Point-Of-Caics

National Institute of General Medical Sciences

- Institutional Development Awards
- Basic, Molecular and Cellular Research Biomedical Technology Research Centers
- Investigator-Initiated Research Grants for Technology Research and Development
  - R21 Instrument Development Grants Specific to Basic, Molecular and Cellular Research
  - All Other Research Project Grants Related to Basic, Molecular and Cellular Research
  - Small Business Grants Related to Basic, Molecular and Cellular Research
- Biomedical Informatics Research Network
- Technology Centers for Networks and Pathways
- All Synchrotron-Related Activities

National Institute on Minority Health and Health Disparities

- Research Centers in Minority Institutions

National Institute of Diabetes and Digestive and Kidney Diseases

- Pancreatic Islet Cell Resource Centers

National Heart, Lung, and Blood Institute

- National Gene Vector Biorepository

BIOGRAPHICAL SKETCH OF NCRR ACTING DIRECTOR LOUISE E. RAMM, PH.D.

Louise E. Ramm, Ph.D., served as the acting director of the National Center for Research Resources at the National Institutes of Health from October 1 to December 23, 2011. She earned her Ph.D. in microbiology at the University of Virginia. After post-doctoral training in biochemistry, also at the University of Virginia, she became a faculty member at the Johns Hopkins School of Medicine in the Microbiology Department.

In 1977, Dr. Ramm joined the Microbiology Department at the Johns Hopkins University School of Medicine, serving as research scientist. From 1982 to 1987, she served as a research associate in Hopkins' Subdepartment of Immunology.

Later in 1987, Dr. Ramm joined the Division of Research Resources, the predecessor organization of NCRR, as a health scientist administrator in the Biological Models and Materials Program and subsequently became the director of the program. She has served as the NCRR deputy director since 1994 and also has served as the director of extramural activities.

In addition, Dr. Ramm has served as the executive secretary of National Advisory Research Resources Council and in various capacities on numerous other NIH committees. She has been an invited lecturer at many biomedical research conferences. Her research in immunochemistry, particularly in the interactions and structure of the complement proteins with cell membranes, resulted in numerous peer-reviewed publications.

NCRR DIRECTORS

Name	In Office from	To

Frederick L. Stone	July 1962	June 1965
Thomas J. Kennedy	July 1965	November 1969
Thomas G. Bowery	November 1969	December 1981
James F. O'Donnell (Acting)	January 1981	September 1982
Betty H. Pickett	October 1982	October 1988
Robert A. Whitney, Jr.	November 1988	August 1992
Judith L. Vaitukaitis	September 1992	March 2005
Barbara M. Alving (Acting)	April 2005	March 2007
Barbara M. Alving	April 2007	October 2011
Louise E. Ramm, Ph.D. (Acting)	October 2011	December 2011

MAJOR EXTRAMURAL PROGRAMS

Division of Biomedical Technology

Biomedical Technology Research Centers

The Division of Biomedical Technology supported the development of a broad spectrum of technologies, techniques and methods via more than 50 Biomedical Technology Research Centers (BTRCs) at academic and other research institutions nationwide. The BTRCs develop versatile new technologies and methods that help researchers who are studying virtually every human disease, each creating innovative technologies in one of five broad areas: imaging resources, informatics resources, optical and laser technology, structural biology, and systems biology. They are complemented by programs providing research project grants to individual investigators and small businesses, often focusing on high-risk, high-reward technological innovation.

These resources create critical, often unique technology and methods at the forefront of their respective fields, and apply them to a broad range of basic, translational and clinical research. This is accomplished through a synergistic interaction of technical and biomedical expertise, both within the resources and through intensive collaborations with other leading laboratories.

BTRCs serve a unique purpose in the broad context of NIH-funded research. They represent a wealth of technological and intellectual resources focused on service and training for investigators. To accelerate translational research, BTRCs actively disseminate technologies, methods and software through approaches ranging from direct distribution to commercialization. The goal of the centers is to promote widespread application of cutting-edge technological discoveries across the full spectrum of science and medicine, from bench to bedside.

Since the dissolution of NCRR, the BTRCs are being administered by the National Institute of Biomedical Imaging and Bioengineering and the National Institute of General Medical Sciences.

Biomedical Informatics Research Network

The Biomedical Informatics Research Network (BIRN), funded by NCRR through December 2011, uses emerging technologies to enhance collaborative efforts that integrate data, expertise and unique technologies from research centers across the country. The collaborative infrastructure is used by BIRN test beds to create new tools and procedures that enable multi-site studies and also benefit single-laboratory research. The tools and datasets, and the underlying collaborative infrastructure, are publicly available. Collaborations within BIRN include scientists in a large number of biomedical sub-disciplines as well as computer scientists and engineers who are creating this cyberinfrastructure.

BIRN tools currently focus on neuroscience and are available to researchers worldwide as they pursue the causes and new treatments of Alzheimer's disease, schizophrenia, major depression, attention deficit hyperactivity disorder and autism. However, researchers in other medical fields, including cardiology and cancer, also can benefit from this infrastructure to support collaborative research and sharing of data and applications.

Since the dissolution of NCRR, BIRN is being administered by the National Institute of General Medical Sciences.

Shared Instrumentation Grant

The Shared Instrumentation Grant (SIG) program provides funding—using the S10 funding mechanism—to institutions to purchase commercially available, expensive, technologically sophisticated equipment for use by groups of NIH-supported researchers. Examples of instrumentation supported by SIG funding include nuclear magnetic resonance systems, electron and confocal microscopes, mass spectrometers, protein and DNA sequencers, biosensors, X-ray diffractometers, and cell sorters. Shared use of these high-sensitivity and high-resolution instruments, essential to understanding fundamental biological processes, optimizes this federal investment. The SIG mechanism provides between $100,000 and $600,000 for the purchase of such instruments.

Since the dissolution of NCRR, the SIG program is being administered by the Office of Research Infrastructure Programs within the Division of Program Coordination, Planning and Strategic Initiatives under the NIH Office of the Director.

High-End Instrumentation

Rapid technological development has led to the production of a new generation of advanced instruments. Instruments in this price range include structural and

functional imaging systems, macromolecular NMR spectrometers, high-resolution mass spectrometers, electron microscopes and supercomputers. As the capabilities of these high-sensitivity, high-resolution instruments increases, so does their cost. To meet the investigators' needs for this advanced technology, in FY 2002, NCRR began the High-End Instrumentation (HEI) program, which allows institutions to acquire equipment that costs more than $750,000. The maximum award is $2 million. The HEI grant program complements the SIG program and also uses the S10 funding mechanism.

Since the dissolution of NCRR, the HEI program is being administered by the Office of Research Infrastructure Programs within the Division of Program Coordination, Planning and Strategic Initiatives under the NIH Office of the Director.

Division for Clinical Research Resources

The NCRR Division for Clinical Research Resources administered the Clinical and Translational Science Awards, a part of the NIH Common Fund enabling researchers to provide new treatments more efficiently and quickly to patients. The division also provided funding to biomedical research institutions to establish and maintain specialized clinical research facilities and clinical-grade biomaterials that enable clinical and patient-oriented research. The DCRR supported these resources through the following programs:

Clinical and Translational Science Awards

The Clinical and Translational Science Award program is designed to more rapidly and efficiently transfer discoveries made in the laboratory into new treatments for patients. Through the CTSAs, academic health centers are working together as a consortium to provide enriched resources to educate and develop the next generation of researchers trained in the complexities of translating research discoveries into clinical trials and ultimately into practice; design new and improved clinical research informatics tools for analyzing research data and managing clinical trials; support outreach to underserved populations, local community, and advocacy organizations and health care providers; assemble interdisciplinary teams that include biologists, clinical researchers, dentists, nurses, pharmacists, biomedical engineers, and veterinarians; and forge new partnerships with private and public health care organizations, including pharmaceutical companies, Veterans Administration hospitals, and health maintenance organizations as well as state health agencies. Additionally, each CTSA is creating an academic home at each grantee institution for clinical and translational research.

The CTSA program was reassigned from NCRR to the National Center for Advancing Translational Sciences.

General Clinical Research Centers

NCRR funded a national network of General Clinical Research Centers (GCRCs) that provided settings for medical investigators to conduct safe, controlled, state-of-the-art, in-patient and out-patient studies of both children and adults. GCRCs also provided infrastructure and resources that supported several career development opportunities. Many of the GCRCs (except for the Baylor College of Medicine — Children) are now being funded under the Clinical and Translational Science Awards (CTSA) program.

National Gene Vector Biorepository

The National Gene Vector Biorepository and Coordinating Center was established on March 31, 2008. The Center stores tissue products for patients who received gene therapy products, purified vectors for pre-clinical and clinical trials. It also houses a searchable pharmacology/toxicology (P/T) database, a reagent repository, educational resources, and insertion site analysis. As of January 2010, it included 33 studies in the P/T database, archived over 70 reagents from seven sites including the NCI, stored 9,322 tissue samples with requests increasing at greater than 40 percent per 6 months, and completed testing on 67 samples for replication competent retrovirus. The site also received a 2009 American Recovery and Reinvestment Act supplement for high-throughput sequencing for clonal outgrowth of vector transduced cells. The proposal requested support for the development of an alternative automated method to standard LM-PCR and LAM-PCR for cloning. The novel method required the development of a novel vector insertion site chip. The biorepository supports an information coordinating center and performs original research in gene vector toxicity. The National Gene Vector Biorepository and Coordinating Center at Indiana University serves as a critical resource for academic investigators conducting gene therapy research. It also seeks to further improve safety for research subjects through education and compliance efforts.

Since the dissolution of NCRR, the National Gene Vector Biorepository and Coordinating Center are being administered by the National Heart, Lung, and Blood Institute.

Human Tissues and Organs Resource

The Human Tissues and Organs Resource Cooperative Agreement supports a procurement network within the National Disease Research Interchange—a not-for-profit organization. By collaborating with various medical centers, hospitals, pathology services, eye banks, tissue banks and organ procurement organizations, the Resource provides a wide variety of human tissues and organs—both diseased and normal—to researchers for laboratory studies. Such samples include tissues from the nervous system, pulmonary system, cardiovascular system, endocrine system, eyes, bone, and cartilage.

Since the dissolution of NCRR, the Human Tissues and Organs Resource is being administered by the Office of Research Infrastructure Programs within the Division of Program Coordination, Planning and Strategic Initiatives under the NIH Office of the Director.

Science Education Partnership Award

The Science Education Partnership Award program encourages scientists to work with educators and other organizations to improve students' (K-12) and the public's understanding of health sciences. The SEPA program supports development of a variety of model projects in biomedical and behavioral science education that make it feasible for scientists, educators, media and community leaders to partner in order to promote science by increasing science literacy. Past models have included a national video education program, a traveling and fixed museum exhibit about AIDS and other health issues, biotechnology research experiences for students and teachers, and health-promoting outreach programs for inner-city and rural communities. SEPA also funds mobile laboratories outfitted with state-of-the-art biotechnology equipment that provide opportunities for science education directly to students at their schools.

Since the dissolution of NCRR, the SEPA program is being administered by the Office of Research Infrastructure Programs within the Division of Program Coordination, Planning and Strategic Initiatives under the NIH Office of the Director.

Division of Comparative Medicine

The NCRR Division of Comparative Medicine (DCM) provided scientists with essential resources—including specialized laboratory animals, research facilities, training and other tools—that enable health-related discoveries. Animal models are a critical part of the biomedical research continuum to bridge the gap between basic science and human medicine. Division programs supported the maintenance and distribution of primate, rodent, aquatic and comparative animal models and resources. The division also funded a unique training program aimed at providing research training for veterinarians and veterinary students.

Since the dissolution of NCRR, DCM programs and resources are being administered by the Office of Research Infrastructure Programs within the Division of Program Coordination, Planning and Strategic Initiatives under the NIH Office of the Director.

Nonhuman Primates

Nonhuman primates are critical components in translational research because of their close physiological similarities to humans. They are used in hypothesis-based research to enable discoveries that allow investigators to relate their research findings directly to human health. Nonhuman primates also are used in pre-clinical, applied research studies to test therapeutic approaches and vaccines. NCRR funded a network of eight National Primate Research Centers, which provide the animals, facilities and expertise to enable studies of nonhuman primates. In addition, the NCRR supported more specialized resources and applied research grants that help to develop specific animal colonies, technologies and reagents that are complementary to, and synergize with, the research activities at the rest of the NPRCs and at other sites. Key research areas included infectious diseases (particularly AIDS), neurobiology, reproductive biology, bio-defense and regenerative medicine. Finally, the Chimpanzee Sanctuary provides housing and lifetime care for chimpanzees no longer needed for research.

Rodents

Rodents play a central role in research that can translate into treatments for human disease. Mice share much in common with human genetics, development, physiology, behavior and disease and are used to predict promising directions in biomedical research. NCRR's laboratory rodents program funded development of genetically engineered rodents and research rodent colonies, facilities that distribute rodents and related biological materials, and new ways to study, diagnose and eliminate laboratory rodent disease.

Aquatics

Some aquatic animals serve as models for studying human development, behavior and disease. With short reproductive cycles and transparent eggs that are easily observed as they develop, zebrafish are useful for research. Other aquatic models include marine slugs. NCRR's aquatic models program funded development and maintenance of critical genetic stocks, biological materials and online information for researchers.

Comparative Models

Comparative models that add flexibility and ease of manipulation in the early stages of the translational discovery process include fruit flies and round worms, which are genetically well characterized and inexpensive and can undergo many genetic manipulations. Results from experiments involving these less complex models can help scientists decide whether to pursue similar research with higher species. NCRR's Comparative Models program supported development and use of new and improved models that complement those more traditionally used to study human diseases.

Genetic, Biological and Information Resources

NCRR supported a variety of sources for genetic analysis services, array technology and databases. This program also supplied critical biological materials, such as stem cells, enzymes and proteinases, as well as online information on model organisms.

Research Training and Career Development Programs

Molecular and genomic studies using animal models help lay the foundation for translational research that benefits human health. Scientists with a background in veterinary medicine contribute unique expertise and important knowledge and skills to this paradigm. To address the significant shortage of trained veterinary researchers, NCRR funded National Research Science Award programs specifically aimed at biomedical research trainees with a veterinary medicine background; NCRR was the only unit within NIH to uniquely fulfill this need. These programs either introduce veterinary students to research during a summer session, allow veterinary students to immerse in a full-time pursuit of research studies for an entire academic year, or encourage graduated veterinarians to pursue biomedical research studies.

Division of Research Infrastructure

The Division of Research Infrastructure developed and invigorated the nation's research capacity and infrastructure at all stages of research—from basic discoveries in the laboratory to advanced treatments for patients. The division supported the following programs to enhance the competitiveness of investigators in underserved states and institutions and also provides funding to build, expand, remodel or renovate research facilities throughout the nation:

Research Centers in Minority Institutions

The Research Centers in Minority Institutions program developed and enhanced the research infrastructure of minority institutions by expanding human and physical resources for conducting basic, clinical and translational research. The RCMI program provided grants to institutions that award doctoral degrees in the health professions or health-related sciences and have enrollments that are predominately students from minority communities underrepresented in the biomedical

sciences. These communities include African Americans, Hispanics, American Indians, Alaska Natives, Native Hawaiians and Pacific Islanders. Because many RCMI investigators study diseases that disproportionately affect minority populations—such as a variety of cancers, diabetes, HIV/AIDS and cardiovascular diseases—the program served the dual purpose of increasing the number of minority scientists engaged in biomedical research and enhancing studies on minority health.

The RCMI program supported research by: 1) providing a wide array of research resources to enhance institutional infrastructure, ranging from state-of-the-art instrumentation to outpatient clinical research facilities; 2) sponsoring faculty development, enrichment and expansion activities; 3) enhancing grants management and research development activities; 4) improving biostatistical and informatics resources and developing new technologies; 5) funding pilot projects; and 6) renovating laboratory and animal facilities. Since the dissolution of NCRR, the RCMI program is being administered by the National Institute on Minority Health and Health Disparities.

Institutional Development Award

The Institutional Development Award program was initiated by Congress to broaden the geographical distribution of NIH grant funding for biomedical and behavioral research. Through the IDeA program, NCRR fostered health-related research and improves the competitiveness of investigators in states that historically have not received significant levels of competitive research funding from NIH. The program serves unique populations, such as minority, rural and medically underserved communities in these states. The IDeA program supports multidisciplinary centers or statewide networks of collaborative partnerships that increase the capacity to conduct cutting-edge biomedical research. Specifically, the IDeA program establishes Centers of Biomedical Research Excellence within institutions to explore multidisciplinary research themes and foster mentoring opportunities. It also creates IDeA Networks of Biomedical Research Excellence within a state that share multidisciplinary, thematic scientific goals. Funding for these networks supports statewide partnerships that include community colleges, tribal colleges, undergraduate and graduate/professional institutions. These networks serve as a "pipeline" for undergraduate students to continue in health research careers.

Since the dissolution of NCRR, the IDeA program is being administered by the National Institute of General Medical Sciences.

Research and Animal Facilities Improvements

Research Facilities Improvement grants increase the nation's ability to conduct state-of-the-art research by providing competitive funding to modernize, repair, renovate and construct research facilities that support basic and/or clinical biomedical and behavioral research investigations. Funding has supported the construction and renovation of numerous biomedical research facilities. Through the Animal Facilities Improvement Program, NCRR provided federal funding to improve animal research facilities, including facility upgrades and the development of programs related to laboratory animal care and use.

Since the dissolution of NCRR, the Research and Animal Facilities Improvements program is being administered by the Office of Research Infrastructure Programs within the Division of Program Coordination, Planning and Strategic Initiatives under the NIH Office of the Director.

NCRR Information Dissemination

The purpose of the NCRR Reporter magazine was to foster communication, collaboration and resource sharing in areas of current interest to scientists and others in the biomedical research field.

The NCRR website presented information about Center programs and activities, while providing ready access to information of interest to both current and potential grantees. The site fostered communication, collaboration and resource sharing in areas of current interest to scientists and the public, as well as other stakeholders in research, such as leaders in academia, industry, voluntary health organizations, patient advocacy groups and scientific professional societies; policy makers; and science teachers.

NCRR's Twitter page offered real-time information about the Center and its grantees to websites and mobile devices. As do other Web-based social media platforms, Twitter allowed users to select content they wished to view, based on relationships and common interests.

NCRR's Facebook page informed social media users about the work accomplished by the Center's grantees and programs and also provided a gateway to the Center's public website. It complemented other NCRR Web communications efforts as well as those across NIH and other parts of the federal government.

U.S. Department of Health & Human Services

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Recent Photos from the National Center for Research Resources (NCRR)

2011 PHOTOS

NCRR provided $2.5 million to the National Center for Image-Guided Therapy at Brigham and Women's Hospital and Harvard Medical School to develop the AMIGO, a one-of-a-kind surgical suite combining real-time imaging of X-ray fluoroscopy and ultrasound with CT, MRI and PET. (Photo courtesy of Junichi Tokuda, Brigham and Women's Hospital, Harvard Medical School.)
lo-res

Immunologist Louis Picker is developing a new vaccine strategy for HIV that uses a benign, yet ever-present virus called cytomegalovirus (CMV) to carry HIV's unique proteins. To develop his vaccine, Picker works in the rhesus monkey model of HIV at the NCRR-funded Oregon National Primate Research Center at Oregon Health & Science University, where he is head of the Division of Pathobiology and Immunology and serves as professor and associate director of the university's Vaccine and Gene Therapy Institute. (Photo courtesy of the Oregon Health & Science University. Design by Palladian Partners, Inc.)
lo-res | hi-res

John Postlethwait and his team are screening thousands of drug candidates for activity to rescue mutations that cause Fanconi anemia (FA), a rare genetic blood disease. With NCRR support, they have developed a model system in zebrafish that are mutated for the zebrafish copies of the human genes for FA and exhibits symptoms that parallel those found in humans with the disease. (Photo by Amanda Rapp.)
lo-res

CDDN researcher Elena Batrakova uses macrophages to deliver nanozymes that destroy inflammation-causing free radicals behind the blood-brain barrier in mice. The Parkinson's disease model holds promise for the human disorder as well as other neurodegenerative diseases. (Photo courtesy of the University of Nebraska Medical Center.)
lo-res | hi-res

Paul Tchounwou and his team at Jackson State University's Center for Environmental Health, funded by NCRR's Research Centers in Minority Institutions program, are studying the effects of arsenic trioxide on leukemia cells. With NCRR support, they may have found a unique way to improve arsenic trioxide's activity in cancer treatment, potentially leading to a novel therapy for some leukemia patients. (Photo courtesy of Jackson State University.)
lo-res

RCMI-funded Morehouse School of Medicine microbiologist Jonathan Stiles focuses his research on neglected diseases. His research has taken him to Ghana to study cerebral malaria — a particularly severe form of a mosquito-borne disease — leading him to ground-breaking research that may change the way malaria is diagnosed in the future. (Photo/Kreativ Touch, Morehouse School of Medicine.)
lo-res

2010 PHOTOS

With pilot funding from the Northwestern University Clinical and Translational Sciences Institute, supported through the CTSA program, researchers studied sticky proteins produced by the foot of the common mussel (*Mytilus edulis*). Northwestern University researcher Phillip Messersmith developed synthetic materials mimicking these proteins that can stick to different surfaces even in wet environments. Messersmith tested these mussel-based "glues" to repair tears that occur in amniotic sacs, a complication of some pregnancies. (Photo courtesy of Northwestern University.)
lo-res

The ImageVis3D Mobile visualization program — free to download via the Apple iTunes store — allows anyone to view realistic, high-resolution 3-D pictures of medical image data. Scientists and doctors now can observe patients' CAT scans, MRIs, ultra-sounds, electron microscopy and other data in 3-D right from their phones. (Photo courtesy of the Scientific Computing and Imaging Institute, University of Utah.)
lo-res

A research team led by Qi-Long Ying at the University of Southern California demonstrated that a gene-targeting mutation in rat embryonic stem

cells can be transmitted through the germline to produce rats with the same mutation, providing a powerful new approach for creating models to study gene function relevant to human diseases. Photo courtesy of Qi-Long Ying, assistant professor of cell and neurobiology at the Keck School of Medicine of USC.

lo-res | hi-res

With both a residency in anesthesiology and a Ph.D., Rebecca Johnson divides her time between clinical work and research at the University of Wisconsin–Madison School of Veterinary Medicine. In the clinic, Johnson serves as the anesthesiologist for all types of animals, from domestic cats to tigers. Photo courtesy of the University of Wisconsin–Madison.

lo-res | hi-res

2009 PHOTOS

Architect Nannette Rodriguez (left) and builder Mark Crudup discuss plans for a new facility at the University of Puerto Rico. Behind them is an artist's rendition of the building — the first in Puerto Rico to be designed exclusively to support research. NCRR supported the building's construction with Extramural Research Facilities Improvement grants. Professor Loyda Meléndez (right) and other university colleagues will use the new facility to conduct research in such areas as neuroscience, cancer and molecular studies. (Artist rendition courtesy of the University of Puerto Rico; portraits by Paco Márquez.)

lo-res | hi-res

Sandy Yoder, MT, senior research specialist, works in Vanderbilt University Medical Center's Pediatric Infectious Diseases Lab. She uses liquid nitrogen to keep vials at 220 degrees below zero. Yoder is putting away influenza samples obtained in vaccine trials at Vanderbilt. (Photo by Neil Brake, courtesy of Vanderbilt University Medical Center.)

lo-res | hi-res

A prototype helmet bears 90 overlapping coils that pick up an MRI signal. The helmet, designed by NCRR-supported researchers at Massachusetts General Hospital, defied scientific dogma to make more powerful brain scans possible. (Lawrence Wald and Graham Wiggins, Massachusetts General Hospital.)

lo-res | hi-res

Science Education Partnership Awards provide two to five years of grant support to stimulate scientific curiosity and encourage hands-on science education activities among students in kindergarten through 12th grade. (Photo courtesy of Palladian Partners, Inc.)

lo-res | hi-res

2008 PHOTOS

Dr. Nasser Altorki, director of the Division of Thoracic Surgery at New York-Presbyterian Hospital/Weill Cornell Medical Center, confers with a colleague about a CT scan of a patient's chest. Weill Cornell Medical College became a member of the Clinical and Translational Science Awards (CTSA) consortium in October 2009. The CTSA Program—led by NCRR—is designed to speed discoveries from the laboratory to clinical practice. (Photo courtesy of Weill Cornell Medical College)

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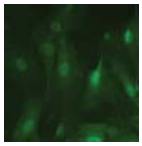

Researchers at the NCRR-supported Yerkes National Primate Research Center introduced—for the first time ever—a gene for a human disease into a primate. The result is an animal model that shows disease progression and symptoms characteristic of human Huntington's disease, which may make it possible to test new therapies for human patients. Here, cells isolated from the monkeys glow because they express a jellyfish gene for green fluorescent protein, which signals the successful transfer of the human disease gene. (Photo by Dr. Anthony Chan/Yerkes National Primate Research Center)

lo-res | hi-res

2007 PHOTOS

Dr. Nasser Altorki, director of the Division of Thoracic Surgery at New York-Presbyterian Hospital/Weill Cornell Medical Center, confers with a colleague about a CT scan of a patient's chest. Weill Cornell Medical College became a member of the Clinical and Translational Science Awards (CTSA) consortium in October 2007. The CTSA Program-led by NCRR-is designed to speed discoveries from the laboratory to clinical practice. (Photo courtesy of Weill Cornell Medical College)

lo-res | hi-res

The sequencing of the rhesus macaque genome-funded by NIH's National Human Genome Research Institute-was performed at the Baylor College of Medicine Human Genome Sequencing Center in Houston, Texas; the Genome Sequencing Center at Washington University in St. Louis, Missouri; and the J. Craig Venter Institute in Rockville, Maryland. This effort was supported by several NCRR-funded National Primate Research Centers. (Photo by Randall C. Kyes / University of Washington)

lo-res

Nashville's Vanderbilt University Institute of Imaging Science received a $2 million High-End Instrumentation (HEI) grant from NCRR to support the purchase of a 7-tesla human magnetic resonance imaging and spectroscopy system. It provides the highest magnetic imaging available for humans

and is one of only several such instruments in the country. (Photo by Dana Johnson, courtesy of Vanderbilt University Medical Center)
lo-res

Physicians, scientists, and engineers at Rhode Island Hospital and The Warren Albert Medical School of Brown University are establishing a multidisciplinary Center of Biomedical Research Excellence in Skeletal Health and Repair to develop treatment strategies for bone and joint diseases such as osteoarthritis. The Center is funded by NCRR's Institutional Development (IDeA) Program, which builds capacity in underserved states. Pictured is Dr. Qian Chen, director of the Center at Rhode Island Hospital. (Photo courtesy of Lifespan/Robin Dunn Blossom)
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U.S. Department of Health & Human Services

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NIH Clinical Center

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MISSION

The NIH Clinical Center is the nation's largest hospital devoted entirely to clinical research. Clinician-investigators translate scientific observations and laboratory discoveries into new approaches to diagnosing, treating, and preventing disease. The Clinical Center was recognized with the 2011 Lasker~Bloomberg Public Service Award for serving as a model research hospital—providing innovative therapy and high-quality patient care, treating rare and severe diseases, and producing outstanding clinician-scientists whose collective work has set a standard of excellence in biomedical research.

About 1,500 clinical research studies are in progress at the Clinical Center. Half are studies of the natural pathogenesis of disease, especially rare diseases, which often are not studied anywhere else. What researchers learn by studying rare diseases adds to the basic understanding of common diseases. Most other studies are clinical trials, the first tests of new drugs and therapies in people. The clinical trials at the Clinical Center are predominantly Phase I and Phase II—first-in-human to test safety and efficacy. Clinical and laboratory research is conducted shoulder-to-shoulder, and this tandem approach drives all aspects of the Clinical Center's operations.

More than 400,000 research volunteers have participated in clinical research studies at the Clinical Center since the hospital opened in 1953. Each year, the center sees 10,000 new research participants, of which there are two types: patient volunteers and healthy volunteers. Patient volunteers are people with specific diseases or conditions who help medical investigators learn more about their condition or test new medications, procedures, or treatments. A healthy volunteer is a person with no known significant health problems who plays a vital role in research to test a new drug, device, or intervention.

At the Clinical Center, clinical research participants are active partners in medical discovery, a partnership that has resulted in a long list of medical milestones, including the first cure of a solid tumor with chemotherapy, gene therapy, use of AZT to treat AIDS, and successful replacement of a mitral valve.

IMPORTANT EVENTS IN CLINICAL CENTER HISTORY

November 1948—Construction of the Clinical Center is started.

June 22, 1951— President Harry S. Truman is the honored guest for the cornerstone ceremony.

July 2, 1953—The Clinical Center is dedicated by DHEW Secretary Oveta Culp Hobby.

July 6, 1953—The first patient is admitted to the Clinical Center.

1954—The Clinical Center's diagnostic X-ray department acquires the only Schnonander angiocardiographic unit in the United States. It takes films in two planes at the rate of six films per second, permitting a graphic demonstration of contrast substances as they pass through the heart, making diagnosis faster and more accurate.

1957—The Clinical Pathology Department develops the first automated machine for counting red and white blood cells (until then counted manually).

1957—The Blood Bank publishes its first research paper, delineating the post-transfusion hepatitis problem, firing the first salvo in a long but largely successful campaign.

1959—A new, circular surgical wing is built.

September 5, 1963—A new surgical wing for cardiac and neurosurgery was dedicated by Luther L. Terry, Surgeon General.

1963—The Blood Bank moves to a new area and blood collections begin on the NIH campus.

1964—Harvey Alter (Clinical Center) and Baruch Blumberg (NIDDK) co-discover the Australian antigen, which Blumberg later shows to be the surface coating of the hepatitis B virus, leading to the isolation of this medically important virus. Blumberg later wins the Nobel Prize. Alter, who later receives the Lasker Award, does

pioneering work in the causes and prevention of blood-transmitted infections, which helps lead to the discovery of the virus that causes hepatitis C and the development of screening methods that will reduce the risk of transfusion-transmitted hepatitis.

1964—John L. Doppman and associates in diagnostic radiology report the first successful imaging of the arteries that supply the spinal cord. The technique of spinal angiography makes surgical intervention possible where spinal arterial malformations, lesions, or tumors cause paralysis.

1966—A Nuclear Medicine Department is established in the Clinical Center.

1966—Wanda S. Chappell, chief nurse in the Blood Bank, comes up with a simple but ingenious method for separating blood platelets (the smallest blood cells) from blood plasma, so that the platelets can be used for transfusion to leukemia patients and the rest of the blood can be used by others, including patients undergoing open heart surgery.

1968—Diagnostic radiologist John L. Doppman develops a method for locating the parathyroid, a group of glands (each about the size of a BB pellet) that regulates calcium metabolism.

1970—The Blood Bank switches to an all-volunteer donor system, and adds a test for hepatitis B surface antigen. Those two measures alone reduce the hepatitis rate from 30 percent before 1970 to about 11 percent after. Later, when it adds more sensitive tests for hepatitis B, the virus virtually disappears as a problem in the Blood Bank.

1972—Blood Bank scientists develop a test for the antigen associated with hepatitis. The test will be used nationally.

1976—The electronic medical information system—one of the nation's first—is introduced.

April 1977—Construction of the ambulatory care research facility is started.

November 1977—The Critical Care Medicine Department is established.

1977—The Blood Bank establishes therapeutic apheresis/exchange programs that for decades will improve the lifespan and welfare of patients with such illnesses as sickle cell disease, hyperlipidemia, and autoimmune disorders. It also establishes the first automated platelet-pheresis center, collecting platelets for transfusion from volunteer donors using automated instrumentation.

1980—The research hospital is renamed the Warren Grant Magnuson Clinical Center, in honor of the former chairman of the Senate Committee on Appropriations, who has actively supported biomedical research at NIH since 1937. (P.L. 96-518.)

June 16, 1981—The first patient with the new disease, later to be named AIDS/HIV, is seen at the Clinical Center.

1981—Clinical research dietitians develop standards of care for the clinical nutrition service and devise diets with controlled intake of certain nutrients to support clinical research.

1982—A new surgical facility and a surgical intensive care unit opens.

March 22, 1984—The first magnetic resonance imaging unit becomes operational for patient imaging.

1984—The Clinical Center Blood Bank is renamed the Department of Transfusion Medicine (DTM) because its activities extend well beyond traditional blood banking. DTM achieves the first transmission of HIV (HTLV III) to a primate through transfusion and describes the HIV seronegative window.

April 13, 1985—Two cyclotrons are delivered to the underground facility operated by the Nuclear Medicine Department.

1986—The Clinical Center signs an agreement to become one of the first donor centers participating in the National Marrow Donor Program.

September 14, 1990—A 4-year-old patient with adenosine deaminate deficiency is the first to receive gene therapy treatment.

April 8, 1991—DTM opens its state-of-the-art facility.

July 1993—The hematology/bone marrow unit opens to improve transplant procedures and develop gene therapy techniques.

May 1994—A multi-institute unit designed and staffed for children opens.

1995—The course “Introduction to the Principles and Practice of Clinical Research” is first offered. It provides education in the basics of safe, ethical, and efficient clinical research.

February 1996—Details on clinical research studies conducted at the Clinical Center are made available online (http://clinicalstudies.info.nih.gov/), increasing opportunities for physicians and patient volunteers to participate in NIH clinical investigations.

November 1996—A Board of Governors is appointed by the Secretary of HHS, marking a new governing system for the Clinical Center.

July 1997—DTM launches a 3,000-square feet model core [cGMP] cell processing facility, created to meet increasing investigative needs for cell products used in new cellular therapies such as immunotherapy, gene therapy, stem cell transplantation, and pancreatic islet cell transplantation.

November 4, 1997—Vice President Al Gore and Senator Mark O. Hatfield attend groundbreaking ceremonies for the Mark O. Hatfield Clinical Research Center, designed to include a new hospital and research laboratories.

1999—The Clinical Pathology Department is renamed the Department of Laboratory Medicine.

1999—The Bench-to-Bedside Awards program is established to speed translation of promising laboratory discoveries into new medical treatments by encouraging collaborations among basic scientists and clinical investigators.

2000—The NIDDK and the Clinical Center (in collaboration with Walter Reed Army Medical Center, the Naval Medical Research Center, and the Diabetes Research Institute of the University of Miami) launch a new kidney, pancreas, and islet transplant program. The idea is to test novel therapies that may eliminate the need for the immunosuppressive drugs patients take to keep their bodies from rejecting new transplanted organs.

2000—The Clinical Center launches a new Pain and Palliative Care Consult Service.

2000—The Imaging Sciences Program takes first steps toward filmless radiology, unveiling the pilot phase of its new Picture Archiving and Communication System (PACS) and Radiology Information System (RIS).

2001—A second bone marrow transplant unit opens to support NCI protocols.

2002—DTM establishes a model program for collecting blood from subjects with hereditary *hemochromatosis*. This program supplies 10 percent of the hospital's red cell needs.

October 29, 2002—A groundbreaking ceremony is held for the Edmond J. Safra Family Lodge. Located steps away from the Clinical Center, the lodge provides a comfortable home away from home for the families and caretakers of Clinical Center patients.

2003—The Office of Clinical Research Training and Medical Education is established to help train the next generation of clinical researchers.

2004—As recommended by the NIH Director's Blue Ribbon Panel on the Future of Intramural Clinical Research, the former Clinical Center Board of Governors assumes a new and larger identity, becoming the NIH Advisory Board for Clinical Research. The board oversees all intramural clinical research, while continuing its oversight of Clinical Center resources, planning and operations.

2004—The Clinical Center formalizes an emergency preparedness partnership with Suburban Hospital and the National Naval Medical Center.

August 21, 2004—The electronic Clinical Research Information System goes live.

September 22, 2004—The dedication ceremony is held for the Mark O. Hatfield Clinical Research Center.

2005—Radiologist Ronald M. Summers finds that computer-aided software, in conjunction with a procedure commonly called virtual colonoscopy, can deliver results comparable to conventional colonoscopy for detecting the most worrisome types of polyps.

2005—Bioethics chief Ezekiel Emanuel co-authors a study suggesting that minority involvement in clinical research is more a matter of access than attitude.

2005—The Rehabilitation Medicine Department opens its clinical movement analysis lab, a joint venture with the NICHD.

April 2, 2005—Patients are moved into the Mark O. Hatfield Clinical Research Center and the building becomes fully operational.

May 26, 2005—An opening ceremony is held for the Edmond J. Safra Family Lodge. The lodge opens its doors to guests on June 1.

2006—The Bench-to-Bedside Awards program extends to include intramural and extramural collaborations.

2006—Nursing and Patient Care Services initiates a collaboration with the Indian Health Service to increase clinical nursing research capabilities.

2007—The first of 1,000 volunteers are enrolled in a study led by the NHGRI to test the use of human genome sequencing in a clinical research study.

January 25, 2007—A ribbon-cutting ceremony is held for a new NIH metabolic clinical research unit that provides researchers from multiple institutes the opportunity to study obesity and related conditions, such as diabetes, heart disease and certain cancers.

2008—The Undiagnosed Diseases Program is established, led by the NHGRI, the NIH Office of Rare Diseases, and the Clinical Center to help and learn from patients who have eluded diagnosis.

2008—Clinical Center nurses undertake a multi-year project to define the clinical research domain of practice and lead the way in establishing it as a recognized nursing specialty practice.

2008—An adaptation of the Clinical Center course “Introduction to the Principles and Practice of Clinical Research” is presented in Beijing.

2008—The Clinical Center begins a partnership with the Uniformed Services University of the Health Sciences and the Department of Defense to conduct clinical research studies in the fields of neuroscience and regenerative medicine. The research involves military and civilian populations.

2009—Two new trans-NIH imaging resources are initiated, the Center for Interventional Oncology and the Center for Infectious Diseases Imaging.

2009—In July, the Biomedical Translational Research Information System (BTRIS), launches its NIH-wide intramural research data repository allowing investigators to view identified data from their active protocols. In December, intramural researchers are able to access de-identified data from clinical and research systems across the NIH intramural programs. BTRIS is designed to facilitate hypothesis generation, data gathering, and analysis.

2009—DTM begins use of a prototype cell expansion system to automate bone marrow stromal cell expansion.

2009—CT and PET/CT equipment purchased by the Clinical Center is now required to routinely record radiation dose exposure in a patient's hospital-based electronic medical record.

January 2010—The Pharmacy Department opens a state-of-the-art pharmaceutical development facility where staff formulate and analyze vaccines and medications not available from manufacturers. These products account for one-third of the drugs (including placebos and varying strengths) that the Clinical Center uses in its research protocols.

April 2010—The NIAID seven-bed Special Clinical Studies Unit opens, with advanced isolation and extended-stay capabilities.

June 2011—The Clinical Center graduates 12 interns from the pilot NIH-Project SEARCH internship program, providing employment opportunities and experience for young adults with developmental disabilities.

September 2011—The Clinical Center is named the 2011 recipient of the Lasker~Bloomberg Public Service Award from the Albert and Mary Lasker Foundation. The award honors the Clinical Center for serving as a model institution that has transformed scientific advances into innovative therapies and provided high-quality care to patients.

October 2011—The Clinical Center acquires one of the first fully integrated whole-body simultaneous PET and MRI devices.

February 2012—The Clinical Center established a Memorandum of Understanding allowing NIH intramural clinical studies of children under the age of two in the Clinical and Translational Science Award (CTSA) clinical unit at Children's National Medical Center in Washington, DC.

March 2012—A new Joint Taskforce between the Clinical Center & the Food and Drug Administration was created to consider exceptions to existing Investigational New Drug policies and procedures for extraordinary clinical circumstances.

August 2012—Researchers from the Clinical Center and National Human Genome Research Institute published a novel use of genome sequencing to help quell Klebsiella pneumonia bacteria outbreak at the Clinical Center in Science and Translational Medicine.

August 2012—The Clinical Center announces a new grant program, Opportunities for Collaborative Research at the NIH Clinical Center, which will support partnerships to expand engagement with extramural investigators interested in collaborating with intramural researchers, using the Clinical Center's unique resources.

September 2012—The first class of the new NIH Medical Research Scholars Program started the year-long research enrichment program, engaging in a mentored basic, clinical, or translational research project that matches their professional interests and career goals.

CC LEGISLATIVE CHRONOLOGY

July 1, 1944—Public Law 78-410, the Public Health Service Act, authorized establishment of the Clinical Center.

July 8, 1947—Under P.L. 80-165, research construction provisions of the Appropriations Act for FY 1948 provided funds "For the acquisition of a site, and the preparation of plans, specifications, and drawings, for additional research buildings and a 600-bed clinical research hospital and necessary accessory buildings related thereto to be used in general medical research."

BIOGRAPHICAL SKETCH OF CC DIRECTOR JOHN I. GALLIN, M.D.

Dr. John Gallin was appointed director of the Clinical Center in 1994. The Clinical Center serves the clinical research needs of 17 NIH institutes and is the largest hospital in the world totally dedicated to clinical research. During his tenure, Dr. Gallin has overseen the design and construction of a new research hospital for the Clinical Center, the Mark O. Hatfield Clinical Research Center, which opened to patients in 2005; the establishment of a new curriculum for clinical research training now offered globally; and development of new information systems for biomedical, translational, and clinical research. In 2011, under Dr. Gallin's leadership, the Clinical Center received the Lasker~Bloomberg Public Service Award.

While serving as Clinical Center director, Dr. Gallin has continued to be an active clinical investigator. His primary research interest is in a rare hereditary immune disorder, chronic granulomatous disease (CGD). His laboratory described the genetic basis for several forms of CGD and has done pioneering research that has reduced life-threatening bacterial and fungal infections in CGD patients.

A New York native, Dr. Gallin attended public school in New Rochelle, New York; graduated cum laude from Amherst College from which he later received an honorary doctorate. He earned an M.D. degree at Cornell University Medical College. After a medical internship and residency at New York University's Bellevue Hospital, he received postdoctoral training in basic and clinical research in infectious diseases at NIH from 1971 to 1974. He then went back to New York University's Bellevue Hospital as senior chief medical resident from 1974-1975 before returning to NIH.

In 1985, Dr. Gallin began a nine-year period as scientific director for intramural research activities at the National Institute of Allergy and Infectious Diseases. Dr. Gallin was the founding chief of the NIAID Laboratory of Host Defenses, served as chief of the laboratory for 12 years, and continues as chief of the lab's clinical

pathophysiology section.

He has published more than 325 articles in scientific journals and has edited two textbooks—"Inflammation, Basic Principles and Clinical Correlates" (Lippincott, Williams, and Wilkins, 1999, now in 3rd edition) and "Principles and Practices of Clinical Research" (Academic Press, 2002, now in 3rd edition).

Dr. Gallin is a member of the American Society for Clinical Investigation, the Association of American Physicians, the Institute of Medicine of the National Academy of Sciences, and he is a Master of the American College of Physicians.

CLINICAL CENTER DIRECTORS

Name	In Office from	To
Jack Masur	1948 1956	1951 1969
John A. Trautman	1951	1954
Donald W. Patrick	1954	1956
Thomas C. Chalmers	1970	1973
Robert S. Gordon, Jr.	1974	1975
Mortimer B. Lipsett	1976	1982
John L. Decker	1983	1990
Saul Rosen (Acting)	1990	1994
John I. Gallin	May 1, 1994	present

MAJOR PROGRAMS

As America's research hospital, the Clinical Center leads the global effort in training today's investigators and discovering tomorrow's cures.

The Clinical Center's mission is to provide a versatile clinical research environment enabling the NIH mission to improve human health by:

- Investigating the pathogenesis of disease
- Conducting first-in-human clinical trials with an emphasis on rare diseases and diseases of high public health impact
- Developing state-of-the-art diagnostic, preventive, and therapeutic interventions
- Training the current and next generation of clinical researchers
- Ensuring that clinical research is ethical, efficient, and of high scientific quality

Major components: Administrative Management; Bioethics; Clinical Epidemiology and Biostatistics; Clinical Research Informatics; Clinical Research Training and Medical Education; Communications and Media Relations; Credentials Services; Critical Care Medicine; Edmond J. Safra Family Lodge; Financial Resource Management; Hospital Epidemiology; Housekeeping and Fabric Care; Hospitality Services; Internal Medicine Consults; Laboratory Medicine; Laboratory for Informatics Development; Management Analysis and Reporting; Materials Management; Medical Records; Nursing; Nutrition; Pain and Palliative Care; Patient Recruitment; Perioperative Medicine; Pharmacy; Purchasing and Contracts; Rehabilitation Medicine; Transfusion Medicine; Pediatric Consults; Protocol Services; Radiology and Imaging Sciences; Social Work; Space and Facility Management; Spiritual Care Ministry; Veterinary Care; Workforce and Management Development.

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Recent Photos from the Clinical Center (CC)

2012 PHOTOS

Celebration of Science Visits NIH
The Celebration of Science, spearheaded by FasterCures and the Milken Institute, convened in early September on the NIH campus to reaffirm America's commitment to bioscience. Scientific and policy leaders gathered to identify how academia, government and industry can break down barriers to work together to develop open innovations in science that will benefit the public. Actor and Dancing with the Stars champion John O'Hurley demonstrated on the equipment in the Clinical Movement and Analysis Laboratory with NIH Director Dr. Francis Collins and Rehabilitation Medicine's Dr. Diane Damiano.
lo-res

Wounded Warriors
The Clinical Center is collaborating with the Walter Reed National Military Medical Center on the Wounded Warrior Project. The Wounded Warriors Project helps injured soldiers transition from military to civilian life with vocational training services. Corporal Mark Sackett stepped on an improvised explosive device as an infantryman in Afghanistan. After his rehabilitation he spent four months in the Clinical Center Rehabilitation Medicine Department helping with the occupational therapy practice. He is now using what he learned in the Clinical Center as he pursues a degree in occupational therapy at Lord Fairfax Community College.
lo-res | hi-res

Functional Electrical Simulation Device Improves Gait in Children with Cerebral Palsy
Researchers in the Clinical Center's Rehabilitation Medicine Department (RMD) are studying an electrical stimulation device designed for children with cerebral palsy who suffer from foot drop and tripping when walking. The WalkAide device stimulates the muscle that lifts up the ankle and the foot on the lower leg. In addition to its success in gait improvement, the RMD team found that electrical stimulation reversed some of the leg muscle wasting caused by the disorder and, in several patients, preserve and increased muscle strength.
lo-res | hi-res

2011 PHOTOS

Dr. John I. Gallin, CC director (second, from left) accepted the 2011 Lasker~Bloomberg Public Service Award on behalf of the CC and the NIH at a ceremony in New York City on September 23, 2011. Presenting the award were from (from left) Maria Freire, Lasker Foundation president; Michael Bloomberg, New York City Mayor and the award's namesake; Alfred Sommer, Lasker Foundation chair; and Dr. Harvey Fineberg, president of the Institute of Medicine and chair of the 2011 Lasker Foundation Public Service Award Committee.
lo-res | hi-res

Radiology and Imaging Sciences technologist Rob Evers (left) talks to a patient before a scan in the fully integrated whole-body simultaneous PET/MRI device. The Clinical Center acquired one of the first of these new machines in the fall; it will contribute to study of traumatic brain injury (TBI) and related post-traumatic stress disorder.
lo-res | hi-res

The Clinical Center graduated 12 interns in June from the pilot NIH-Project SEARCH program, a 30-week unpaid internship in various departments to provide employment opportunities and experience for young adults with disabilities. The program earned the Clinical Center the 2011 Employer of the Year award from Maryland Works, Inc., and has since grown to place interns with other NIH institutes and centers.
lo-res | hi-res

2009 PHOTOS

Precision is the goal of a new collaboration involving the Clinical Center, the National Cancer Institute, and the National Heart, Lung, and Blood Institute. The Center for Interventional Oncology will pull on the strengths of each to investigate how imaging technology can diagnose and treat localized cancers in ways that are precisely targeted and minimally or non-invasive. Chief of the new Center for Interventional Oncology, Dr.

Bradford Wood, demonstrates image-guided tumor ablation in a CC Radiology and Imaging Sciences suite.

lo-res | hi-res

BTRIS, the Biomedical Translational Research System, was implemented in two phases in 2009. The July launch of the NIH-wide intramural research data repository allowed principal investigators to view identified data from their active protocols. In December, intramural researchers were able to access de-identified from clinical and research systems across the intramural program. On hand to help launch BTRIS on July 30 were *(from left)* Elaine Ayres, deputy chief of the CC Laboratory for Informatics Development (LID); Dr. Jack Jones, NIH chief information officer; Dr. Jim Cimino, BTRIS project director and chief of the CC Laboratory for Informatics Development; and Dr. Michael Gottesman, NIH deputy director of intramural research.

lo-res | hi-res

This page last reviewed on March 14, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

NIH...Turning Discovery Into Health®

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Historical Data

- **Chronology of Events**
  Significant events and major research advances in NIH history, from 1798 to the present.
- **Directors** of the NIH
- **Photo Gallery**
  High-resolution photos of past presidential visits, NIH campus buildings, scientists and more.

MORE INFORMATION:

- Legislative Chronology
  Federal legislation that had a major influence on the growth of the NIH, from its beginning as the Marine Hospital Service in 1798, to the present.
- Deputy Directors of the NIH
- Associate Directors of the NIH
- Secretaries of the Department of Health and Human Services (HHS)
- Nobel Laureates associated with the NIH
- Major NIH Lectures, highlights from the NIH
- Budget, Appropriations for the NIH

This page last reviewed on February 22, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

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National Institutes of Health
Turning Discovery Into Health

Chronology of Events

1700 | 1800 | 1900 | 1910 | 1920 | 1930 | 1940 | 1950 | 1960 | 1970 | 1980 | 1990 | 2000 | 2010

1700

1798

The Marine Hospital Service was established with the July 16 signing by President John Adams of an act for the relief of sick and disabled seamen.

1799

An amending act of March 2 extended benefits of the Marine Hospital Service to officers and men of the U.S. Navy.

1800

1802

The admission of foreign seamen to Marine hospitals on a reimbursable basis was authorized on May 3.

1803

The first permanent Marine hospital was authorized on May 3 to be built in Boston, Mass.

1807

Dr. Benjamin Waterhouse was appointed physician in charge of the Boston Marine Hospital on November 27. He was the first to introduce interns and residents into hospitals in the United States.

1836

The Library of the Office of the Surgeon General of the Army was established (the present National Library of Medicine).

1865

John Shaw Billings, M.D., was assigned to supervise the Surgeon General's Library, which he built into a national resource of biomedical literature.

1870

A bill dated June 29 provided for administration of Marine hospitals within a Bureau of the Treasury Department with a medical officer in charge.

1871

Dr. John Maynard Woodworth was appointed supervising surgeon of the Marine Hospital Service in April, marking the beginning of central control of Marine hospitals.

1873

Regulations were approved on December 1 for appointment and promotion of physicians in the Marine Hospital Service, establishing the first career service for civilian employees in the Federal Government.

1875

A bill passed on March 3 authorized admission of Navy seamen and seamen of other government services to Marine hospitals on a reimbursable basis.

In recognition of Dr. Woodworth's progress in reorganizing the Marine Hospital Service, his title was changed by law to supervising Surgeon General on March 3.

1878

The first Federal Quarantine Act was passed April 29.

On December 21, Congress appropriated funds "for investigating the origin and causes of epidemic diseases, especially yellow fever and cholera."

1879

The National Board of Health was created by law on March 3. It represented the first organized, comprehensive, national medical research effort of the Federal Government.

Dr. John B. Hamilton was appointed Surgeon General of the Marine Hospital Service, April 3.

1884

The seamen's hospital tax was abolished on July 1. The cost of maintaining Marine hospitals was paid out of a tonnage tax, which continued until 1906.

1887

A bacteriological laboratory, known as the Laboratory of Hygiene, was established under Dr. Joseph J. Kinyoun at the Marine Hospital, Staten Island, N.Y., in August, for research on cholera and other infectious diseases (renamed Hygienic Laboratory in 1891.)

1889

The commissioned corps was authorized on January 4 establishing by law the policy of a mobile corps subject to duty anywhere upon assignment.

1890

Congress gave the Marine Hospital Service interstate quarantine authority on March 27.

1891

The Hygienic Laboratory moved from Staten Island, N.Y., to the Butler Building, Service Headquarters, Washington, D.C., in June.

Dr. Walter Wyman was appointed Surgeon General of the Marine Hospital Service on June 1.

1893

A new Quarantine Act, passed February 15, strengthened the Quarantine Act of 1878 and repealed the act establishing the National Board of Health.

1899

The Marine Hospital Service was directed by Congress on March 2 to investigate leprosy in the United States.

Dr. Milton J. Rosenau succeeded Dr. Kinyoun as director of the Hygienic Laboratory on May 1.

1900

1902

The earliest studies of Rocky Mountain spotted fever took place in Montana.

A bill approved July 1 changed the name of the Marine Hospital Service to the Public Health and Marine Hospital Service and established an advisory board for the Hygienic Laboratory. It later became the National Advisory Health Council.

The 57th Congress enacted Public Law 244 to regulate the shipment of biologics. The technical responsibilities of the program were assigned to the Hygienic Laboratory.

The Advisory Board for the Biologics Control Division was established July 1.

The Pan American Sanitary Bureau was established December 2. The Public Health and Marine Hospital Service began international health cooperation.

1904

The Hygienic Laboratory moved to a new building on a 5-acre tract at 25th and E Streets NW, Washington, D.C., on March 16.

1906

Medical care for merchant seamen and other beneficiaries of the Public Health and Marine Hospital Service began to be supported by direct congressional appropriations, with the repeal of the tonnage tax on June 30.

1909

Dr. John F. Anderson was appointed Hygienic Laboratory director on October 1.

1910

1912

Dr. Rupert Blue was appointed Surgeon General of the Public Health and Marine Hospital Service on January 13.

The name Public Health and Marine Hospital Service was changed to Public Health Service (PHS) on August 14, and the research program was expanded to include other-than-communicable diseases field investigations, navigable stream pollution, and information dissemination.

1914

Dr. Joseph Goldberger announced his views of pellagra as a dietary deficiency, emphasizing the importance of dietary deficiency diseases.

1915

Dr. George W. McCoy was appointed Hygienic Laboratory director on November 20.

1918

The Chamberlain-Kahn Act, passed July 9, provided for the study of venereal diseases. The PHS made grants to 25 institutions, establishing a precedent for the Federal Government to seek assistance of scientists through grants.

The PHS reserve corps was established by law on October 27, during the influenza pandemic, as a means of coping with the emergencies.

1920

Dr. Hugh Smith Cumming was appointed PHS Surgeon General on March 3.

1921

The Rocky Mountain Spotted Fever Laboratory was established in a former school building in Hamilton, Mont., on September 20 as a recognized PHS field station.

1922

The Library of the Office of the Surgeon General (Army) was renamed the Army Medical Library in January.

A Special Cancer Investigations Laboratory was established by PHS investigators at Harvard Medical School on August 1.

1929

On January 19, the Narcotics Control Act was passed, authorizing construction of two hospitals for drug addicts, and creation of a PHS Narcotics Division.

1930

On April 9, the Advisory Board for the Hygienic Laboratory became the National Advisory Health Council.

On May 26 the Ransdell Act redesignated the Hygienic Laboratory as the National Institute of Health, authorizing $750,000 for construction of two buildings for NIH, and creating a system of fellowships.

On June 14, Public Law 357 authorized creation of a separate Bureau of Narcotics in the Treasury Department and changed the PHS Narcotics Division to the Division of Mental Hygiene. The law gave the Surgeon General authority to investigate the causes, treatment, and prevention of mental and nervous diseases.

1935

A narcotic "farm" at Lexington, Ky., was completed and opened on May 29.

On August 10, Mr. and Mrs. Luke I. Wilson made a gift of 45 acres of their estate "Tree Tops" for use of the National Institute of Health in Bethesda, MD.

Title VI of the Social Security Act was passed August 14 authorizing the expenditure of up to $2 million on health grants to the states for "investigation of disease and problems of sanitation."

1936

Dr. Thomas Parran was appointed PHS Surgeon General on April 6.

1937

The Rocky Mountain Laboratory became part of the National Institute of Health in February, and was administratively made part of the Division of Infectious Diseases.

Dr. Lewis R. Thompson was appointed director of the National Institute of Health on February 1.

With the reorganization of the National Institute of Health into eight divisions, the biologics control program, previously the responsibility of the Division of Pathology and Bacteriology, NIH, was assigned to a newly established Division of Biologics Control (redesignated Biologics Control Laboratory, 1944).

The National Cancer Institute Act was signed on July 23.

1938

The National Advisory Cancer Council recommended approval of the first awards for fellowships in cancer research on January 3.

Mrs. Luke I. Wilson made a second gift of 10.7 acres, to NIH on May 28.

The cornerstone for Building 1 was laid June 30.

Congress approved construction of new, larger laboratory facilities, and NIH moved to Bethesda, MD., in July.

Mrs. Luke I. Wilson made a third gift, 14.4 acres of land, to NIH on September 30.

The narcotics hospital at Fort Worth, Tex., was dedicated on October 28.

1939

Under a Reorganization Act dated April 3, the PHS was transferred from the Treasury Department to the Federal Security Agency.

1940

Mrs. Luke I. Wilson made a fourth gift, 11.6 acres of land, to NIH on September 27.

President Franklin D. Roosevelt dedicated the buildings and the grounds of the National Institute of Health on October 31.

1942

Dr. Rolla Eugene Dyer was appointed director of the National Institute of Health on February 1.

A final gift of land was made by Mrs. Luke I. Wilson on March 17 bringing the total to 92 acres. This was the nucleus of the present 306.4-acre reservation. Additional land was acquired through a series of purchases.

1943

NIH was given bureau status in the PHS on November 11.

1944

The PHS act was approved on July 1, consolidating and revising existing public health legislation, and giving NIH the legislative basis for its postwar program, with general authority to conduct research. Under this act NCI became a division of NIH.

1946

The Research Grants Office was created at NIH in January to administer the Office of Scientific Research and Development projects transferred to the PHS at the end of World War II and to operate a program of extramural research grants and fellowship awards.

The National Mental Health Act was passed July 3.

On August 12, the Research Grants Office became the Research Grants Division (later renamed Division of Research Grants). The division was instructed by the National Advisory Health Council to establish study sections for scientific and technical review of research grant applications, and to explore neglected areas of research in the health sciences.

The Hospital Survey and Construction Act, introduced by Senators Lister Hill and Harold H. Burton, was passed on August 13, authorizing the Hill- Burton program.

1948

Dr. Leonard A. Scheele was appointed PHS Surgeon General on April 6.

On June 16 the National Heart Act was signed. It authorized the National Heart Institute and changed the name of the National Institute of Health to National Institutes of Health.

The National Dental Research Act, passed June 24, authorized the National Institute of Dental Research.

The National Heart Institute was established August 1.

The National Institute of Dental Research was established September 16.

Construction of the Clinical Center was started in November.

The National Microbiological Institute and the Experimental Biology and Medicine Institute were established on November 1.

The Rocky Mountain Laboratory and Biologics Control Laboratory became two of the four components of the National Microbiological Institute on November 1.

1949

The purchase of 115.8 acres from the Town & Country Golf Club, Inc., for $600,000 was concluded February 11.

The purchase of 47.9 acres of land from Mr. and Mrs. G. Freeland Peter for $505,000 was concluded on February 14.

The National Institute of Mental Health was established on April 15, with the abolishment of the Division of Mental Hygiene.

The first issue of The NIH Record was published May 20.

The purchase of 50.2 acres of land from the Sisters of the Visitation for $173,058 was concluded on June 28.

Dr. Frank B. Rogers became director of the Army Medical Library in October.

1950

The Omnibus Medical Research Act, signed August 15, authorized the National Institute of Neurological Diseases and Blindness and the National Institute of Arthritis and Metabolic Diseases, the latter absorbing the Experimental Biology and Medicine Institute. The act also gave the Surgeon General authority to establish new institutes.

Dr. William H. Sebrell, Jr. was appointed NIH director on October 1.

The National Institute of Neurological Diseases and Blindness and the National Institute of Arthritis and Metabolic Diseases were established November 22.

1951

The first R. E. Dyer Lecture was given by Dr. George W. Beadle, California Institute of Technology, June 21.

President Harry S. Truman laid the Clinical Center cornerstone on June 22.

1952

The Army Medical Library was renamed Armed Forces Medical Library in April.

1953

The first NIH Lecture was given on January 21 by Dr. Severo Ochoa of New York University College of Medicine.

PHS became part of the newly created Department of Health, Education, and Welfare on April 11.

The Clinical Center was dedicated on July 2, extending the clinical dimension of PHS research programs.

The first patient was admitted to the Clinical Center on July 6.

1954

A central data processing facility was established in the Office of the Director, NIH.

The NIH Graduate School Program began on September 27.

1955

The biologics control function was placed in the newly formed Division of Biologics Standards in June. The Division of Research Services and Division of Business Operations were also formed.

The Cancer Chemotherapy National Service Center was established April 1 to coordinate the first national cancer chemotherapy program.

The Mental Health Study Act was passed July 28.

Dr. James A. Shannon was appointed NIH director on August 1.

The National Microbiological Institute became the National Institute of Allergy and Infectious Diseases (NIAID) by order of the Surgeon General on December 29. The Biologics Control Laboratory was detached from the institute and expanded to division status within NIH.

1956

In January the biometric facility became the Biometrics Branch in the new Division of Research Services.

Dr. Leroy E. Burney was appointed PHS Surgeon General August 8.

The Armed Forces Medical Library was designated the National Library of Medicine (NLM) and placed under PHS October 1.

1957

The Center for Aging Research was established November 27 as the focal center for NIH extramural activities in gerontology.

1958

On July 16 the Division of General Medical Sciences was established by order of the Surgeon General, extending research into noncategorical areas covered until that time by the Division of Research Grants.

The Center for Aging Research was transferred from the National Heart Institute to the Division of General Medical Sciences on November 4.

1959

The Office of Administrative Management was formed July 15, consolidating the Division of Business Operations and other managerial responsibilities.

Congress appropriated $2 million for the establishment of one or two private research centers on August 19.

1960

On March 8 the Surgeon General approved establishment of a Computation and Data Processing Branch in the Division of Research Services.

NIH acquired 513 acres of farmland near Poolesville, MD., on May 6. This land became the site of the NIH Animal Center.

The International Health Research Act was passed July 12, extending NIH international programs.

1961

The Surgeon General established the Center for Research in Child Health in the Division of General Medical Sciences on February 17.

Dr. Luther L. Terry was appointed PHS Surgeon General March 24.

On May 26, DHEW Secretary Abraham A. Ribicoff dedicated the new NIDR building.

The first Jules Freund Lecture was given by Dr. Merrill W. Chase of the Rockefeller Institute on November 15.

The NIH European Office was established in Paris, France, on December 18.

1962

The NIH Latin American Office was established in Rio de Janeiro, Brazil, July 1.

The Division of Research Facilities and Resources was established July 15.

Public Law 87-838, passed October 17, authorized the National Institute of Child Health and Human Development and the National Institute of General Medical Sciences.

Five acres of land for a Gerontology Research Center were donated by the City of Baltimore in December.

1963

The NIH Pacific Office was established in Tokyo, Japan, on January 1.

The National Institute of Child Health and Human Development and the National Institute of General Medical Sciences were established on January 30.

The Center for Research in Child Health and the Center for Research in Aging (established in 1956) were transferred from NIGMS to NICHD.

The surgical wing for the Clinical Center was dedicated September 5.

The first NIH International Lecture was given October 31 by Dr. Walsh McDermott of Cornell University Medical College.

1964

The Medical Literature Analysis and Retrieval System (MEDLARS) became operational at the NLM in January.

The Division of Computer Research and Technology was established on April 16.

On September 19 Congress authorized planning funds for a central environmental health research facility.

A special virus-leukemia program was initiated under a special appropriation, included in the FY 1965 appropriation signed into law on September 19.

1965

On January 7, the Surgeon General announced that the National Environmental Health Sciences Center would be located in Research Triangle Park, N.C.

The NIH Animal Center, Poolesville, MD., officially opened May 27 with 2 days of orientation for NIH employees, area residents and the press after completion of the first of three phases of an $18 million construction program.

NIH received a $20,250,000 supplemental appropriation on August 31 to intensify and expand support of research in heart disease, cancer, stroke and related diseases.

Dr. William H. Stewart, appointed PHS Surgeon General September 24, took office on October 2.

A reorganization of the DHEW provided for an expansion of the secretary's office with the creation of three new assistant secretaries, including an assistant secretary for health and scientific affairs.

Dr. Philip R. Lee was appointed to the new position of assistant secretary for health and scientific affairs on November 2.

1966

The Division of Regional Medical Programs was created on February 1 to administer grants under the Heart Disease, Cancer and Stroke Amendments of 1965. Dr. Robert Q. Marston was appointed NIH associate director for regional medical programs and chief of the division.

At a White House meeting June 27, the NIH director and institute directors discussed with the President how the benefits of research findings in health could be brought more rapidly to all the people. Later in the year, a report to the President described current NIH research efforts on the major U.S. disease problems and set forth the status of those problems, the nature of present and planned investigative efforts and the problems of and opportunities for further research.

A Division of Environmental Health Sciences was established in NIH November 1 to conduct, foster and coordinate research on the biological, chemical, and physical effects of environmental agents. Dr. Paul Kotin, scientific director for etiology, NCI, was named director of the new division.

An advisory committee to the NIH director was appointed on November 9 to provide advice on the further development of NIH research and related programs.

1967

The National Institute of Mental Health was separated from NIH and raised to bureau status in PHS by a reorganization that became effective January 1. NIMH's Division of Clinical, Behavioral and Biological Research, within the mental health Intramural Research Program, comprising activities conducted in the Clinical Center and other NIH facilities, continued here under an agreement for joint administration between the two companion bureaus. The Toxicology Information Program was established at NLM, January 1, in response to recommendations of the President's Science Advisory Committee. The program includes the entire range of chemical effects on living organisms.

The PHS Audiovisual Facility, renamed the National Medical Audiovisual Center, became an NLM component July 1.

On September 26, the deed for 509.25 acres of Research Triangle Park, N.C., to serve as a permanent site for the Division of Environmental Health Sciences, was presented to the Surgeon General.

1968

Establishment of the John E. Fogarty International Center for Advanced Study in the Health Sciences (FIC) was given departmental approval February 26. The center became operational on July 1, at which time the NIH Office of International Research was abolished and certain of its functions were transferred to FIC and NIAID.

Under a reorganization of health activities announced on April 1, NIH assumed status as a new operating agency within the department, with the NIH director reporting directly to the assistant secretary for health and scientific Affairs. Under the reorganization, the Bureau of Health Manpower and the National Library of Medicine became components of NIH.

On June 15 the four-story $7.5 million Gerontology Research Center building, located at and operated in cooperation with Baltimore City Hospitals, was officially opened.

A proposed facility to house the biomedical communications network was designated the Lister Hill National Center for Biomedical Communications by passage of P.L. 90-456 on August 3.

Established by the DHEW secretary on August 9, the Center for Population Research conducts a contract and grant program in population and reproduction research. The center was designated by the President as the primary Federal agency responsible for population research and training.

On August 16 the National Eye Institute was created to build an enlarged program based on blindness research formerly conducted in the National Institute of Neurological Diseases and Blindness. The legislation also changed the NINDB name to the National Institute of Neurological Diseases.

Dr. Robert Q. Marston was sworn in as NIH director on August 29.

A Nobel Prize in Physiology or Medicine was awarded on October 16 to Dr. Marshall W. Nirenberg, chief of NIH's Laboratory of Biochemical Genetics, for discovering the key to deciphering the genetic code. He was the first NIH Nobel laureate, and the first Federal employee to receive a Nobel Prize.

On October 24 the President signed into law (P.L. 90-639) legislation changing the name of the NIND to the National Institute of Neurological Diseases and Stroke.

The National Eye Institute was established on December 26.

1969

A further reorganization of the NIH internal structure announced January 4 renamed the Bureau of Health Manpower as the Bureau of Health Professions Education and Manpower Training and expanded it to include seven divisions, one of which was the Division of Research Resources (DRR).

The Division of Environmental Health Sciences was elevated to institute status on January 12, thus becoming the 10th NIH institute.

Dr. Roger O. Egeberg was named DHEW assistant secretary for health and scientific affairs on July 14, succeeding Dr. Lee.

On November 10, the DHEW secretary redesignated the National Heart Institute as the National Heart and Lung Institute (NHLI).

1970

A reorganization of the Bureau of Health Professions Education and Manpower Training renamed it the Bureau of Health Manpower Education on September 18. DRR was separated from the bureau and became a division within NIH.

1971

Dr. Merlin K. DuVal was appointed DHEW assistant secretary for health and scientific affairs on July 1, succeeding Dr. Egeberg.

The White House Conference on Aging recommended creating a separate National Institute on Aging on December 2.

On December 23 the President signed the National Cancer Act of 1971 initiating a National Cancer Program, establishing the President's Cancer Panel, a National Cancer Advisory Board and 15 new research, training and demonstration cancer centers.

1972

The National Institute of Arthritis and Metabolic Diseases was renamed the National Institute of Arthritis, Metabolism, and Digestive Diseases on May 19. On July 1, DBS transferred from NIH and officially became a sixth bureau, the Bureau of Biologics in the Food and Drug Administration. The bureau continues to use NIH facilities and buildings.

The DHEW secretary approved a reorganization of NHLI on July 14, elevating the institute to bureau status within NIH. A bureau-level organization was established for the National Cancer Institute on July 27.

On October 25 Public Law 92-564 established a temporary National Commission on Multiple Sclerosis (supported by NINDS).

Dr. Christian B. Anfinsen, NIAMDD, won the Nobel Prize in Chemistry for his work on ribonuclease.

1973

Dr. Charles C. Edwards was appointed DHEW assistant secretary for health on April 18, succeeding Dr. DuVal.

Dr. Robert S. Stone was sworn in as the 10th NIH director on May 29.

The Bureau of Health Manpower Education was transferred from NIH to the new Health Resources Administration on July 1 and renamed the Bureau of Health Resources Development.

The National Institute of Mental Health rejoined the National Institutes of Health on July 1. On September 25, NIMH became part of the new Alcoholism, Drug Abuse and Mental Health Administration.

1974

The Research on Aging Act of 1974, creating the National Institute on Aging, was signed into law on May 31.

On July 23, the National Cancer Act Amendments of 1974 were signed by the President to improve the National Cancer Program. It also established a President's Biomedical Research Panel.

The National Institute on Aging was established on October 7.

The Interagency Primate Steering Committee was established by the DHEW assistant secretary for health with NIH as the lead agency.

Institutional Relations Branch was transferred on October 27 from DRG to the immediate Office of the Director, NIH, and renamed the Office for Protection From Research Risks.

1975

On March 13 the National Institute of Neurological Diseases and Stroke was renamed the National Institute of Neurological and Communicative Disorders and Stroke.

Dr. Theodore Cooper was appointed DHEW assistant secretary for health on July 1, succeeding Dr. Edwards.

Dr. Donald S. Fredrickson was sworn in as the 11th NIH director on July 1.

The Adult Development and Aging Branch and the Gerontology Research Center were separated from NICHD to become the core of the National Institute on Aging, also on July 1.

1976

On June 25, the National Heart and Lung Institute was renamed the National Heart, Lung, and Blood Institute.

Dr. D. Carleton Gajdusek, NINCDS, shared the Nobel Prize in Physiology or Medicine with Dr. Baruch Blumberg, Institute for Cancer Research. Dr. Gajdusek was honored for his research on kuru and Dr. Blumberg for his work on the Australia antigen at the National Institute of Arthritis and Metabolic Diseases (1957-1964).

1977

Construction of the Ambulatory Care Research Facility was started in April.

On July 13, Dr. Julius B. Richmond took the oath of office as DHEW assistant secretary for health and Surgeon General, becoming the first person to hold both offices simultaneously.

1978

On November 15 the DHEW secretary announced the establishment of the National Toxicology Program under the direction of NIEHS.

1979

Dr. Hans J. Muller Eberhard, Scripps Clinic and Research Foundation, delivered the first Kinyoun Lecture on April 24.

A protocol of cooperation in the exchange of information on medicine and public health between the United States and China was signed on June 22 in Beijing's historic Great Hall. The DHEW secretary signed on behalf of the United States.

On July 18 NCI and the National Naval Medical Center, Bethesda, MD., agreed to cooperate in a cancer treatment research program.

1980

DHEW became the Department of Health and Human Services (DHHS) on May 14.

A separate Department of Education was established.

On May 22, the Lister Hill Center for Biomedical Communications was dedicated as part of NLM.

1981

On May 14 Dr. Edward N. Brandt, Jr., was sworn in as assistant secretary for health.

The National Institute of Arthritis, Metabolic, and Digestive Diseases was renamed the National Institute of Arthritis, Diabetes, and Digestive and Kidney diseases on June 23.

On June 30 Dr. Fredrickson stepped down as NIH director. Dr. Thomas E. Malone was appointed acting director.

The Ambulatory Care Research Facility was officially dedicated on October 22. The research hospital was renamed the Warren Grant Magnuson Clinical Center in honor of the former chairman of the Senate Committee on Appropriations. Sen. Magnuson was involved in support of biomedical research at NIH since 1937.

Dr. C. Everett Koop became PHS Surgeon General on November 16.

1982

On April 22 NIADDK was converted to bureau status, joining NCI, NHLBI, and NLM. Dr. James B. Wyngaarden, chairman of the Duke University department of medicine, was appointed NIH director on April 29.

The National Institute of Child Health and Human Development marked its 20th anniversary on September 20.

NIGMS celebrated its 20th anniversary by establishing the DeWitt Stetten, Jr., Lectureship. Dr. David S. Hogness, Stanford University, gave the first lecture, October 13.

The National Institute on Aging opened its first on-campus research unit in the NIH Clinical Center.

The NIEHS facility in Research Triangle Park, N.C., was dedicated on November 15.

Lasker Foundation Awards were presented on November 17 to three NIH scientists: Dr. Elizabeth Neufeld, NIADDK; Dr. Roscoe O. Brady, NINDS; and Dr. Robert C. Gallo, NCI.

1983

On January 18, Building 1 was officially named the James A. Shannon Building in honor of the former NIH director (1955-1968).

The first multidisciplinary pain clinic in the United States devoted exclusively to research was opened in the Clinical Center March 21 by NIDR.

NCI dedicated its R.A. Bloch International Cancer Information Center on October 2. The building houses the institute's information programs that serve health professionals and scientists.

In December, the Clinical Center celebrated its 30th anniversary of operation.

1984

NIH purchased the Convent of the Sisters of the Visitation of Washington along with about 11 acres of land for $4.5 million.

In May NCI scientists headed by Dr. Robert C. Gallo, Jr., uncovered strong evidence that variants of a human cancer virus called HTLV-III are the primary cause of acquired immunodeficiency syndrome (AIDS).

DCRT celebrated its 20th anniversary in May.

NIH and Howard Hughes Medical Institute launched a multimillion dollar cooperative program in August to help increase the vigor of American biomedical research and continue the flow of new doctors into research areas.

The former Convent was dedicated September 19 as the Mary Woodard Lasker Center for Health Research and Education.

1985

NIH and the Howard Hughes Medical Institute chose the first 25 HHMI-NIH research scholars in June.

In July the NIA celebrated its 10th anniversary.

1986

In May the National Institute of Arthritis and Musculoskeletal and Skin Diseases became a separate institute separated from its parent NIADDK - now called the National Institute of Diabetes and Digestive and Kidney Diseases. Also created was the National Center for Nursing Research.

NIH held the First Intramural Research Day on September 25 featuring symposia and poster sessions.

In June NIAID funded 14 centers to evaluate experimental drugs in the treatment of AIDS.

NIH opened its year-long centennial celebration—A Century of Science for Health—on October 16.

1987

NIH scheduled monthly events, hosted by individual components throughout the year, to commemorate its 100th anniversary.

NIAID awarded contracts to five medical centers to establish AIDS treatment evaluation units.

NIEHS celebrated its 20th anniversary, while NIGMS and DRR marked their 25th.

Fifty-six promising science students—one from each state and U.S. possession—were honored by NIH as centennial scholars.

On July 23 President Reagan named a 13-member Commission on the Human Immunodeficiency Virus Epidemic, which held its first meeting following the announcement.

NIH became a smoke-free agency on September 1, banning smoking in all buildings.

Hundreds of NIH alumni from the United States and abroad returned to the campus on October 15-16 to help close out the year-long celebration of the NIH centennial.

1988

Recognizing the importance of computerized information processing methods for the conduct of biomedical research, Congress establishes the National Center for Biotechnology Information (NCBI) as a division of the National Library of Medicine on November 4.

NIH was honored by Spain with the presentation of the Grand Cross of the Civil Order of Health.

The NICHD celebrated its 25th anniversary and NIAID and NIDR marked their 40th.

The Children's Inn at NIH, a temporary home away from home for NIH pediatric patients, was dedicated. A gift of $2.5 million from Merck and Co., Inc. was donated toward the construction of the building.

"Sky Horizon," a sculpture created by Louise Nevelson, was provided to the NIH on loan by Edwin C. Whitehead, founder of the Whitehead Institute of Biomedical Research.

Officials from NICHD, NINDS, and NIMH broke ground for a facility they will share—Building 49, the Child Health and Neurosciences Building.

November marked the establishment of the National Institute on Deafness and Other Communication Disorders. The parent institute was renamed the National Institute of Neurological Disorders and Stroke.

1989

On May 10, Building 31 was named the Claude Denson Pepper Bldg. to honor NIH's "legislative father."

The NIH Record marked its 40th year of publication in May.

On May 22, NIH conducted its first gene transfer in humans. A cancer patient was infused with tumor-infiltrating lymphocytes (TIL) that had been altered by insertion of a gene. This allowed scientists to track the special cancer-fighting cells in the body to increase the understanding of TIL therapy.

1990

The National Center for Human Genome Research was established in January.

DRR and DRS merged in March and named the National Center for Research Resources.

On June 21 the Children's Inn at NIH opened its doors to pediatric patients and their families. The President and Mrs. Bush attended the ceremonies.

The Recombinant DNA Advisory Committee approved the first experiments involving transfer of human genes for therapeutic purposes on July 31. The treatment was initiated on September 14 in a 4-year-old girl with adenosine deaminase deficiency.

The National Institute of Neurological Disorders and Stroke and the National Institute of Diabetes and Digestive and Kidney Diseases marked their 40th anniversaries.

It was announced in September that the gene that caused osteoarthritis was isolated by scientists supported by the National Institute of Arthritis and Musculoskeletal Diseases.

The Office of Research on Women's Health was established to strengthen NIH's efforts to improve the prevention, diagnosis and treatment of illness in women and to enhance research related to diseases and conditions that affect women.

1991

On January 29, NIH scientists treated the first cancer patients with human gene therapy. Two patients received transfusions of special cancer-killing cells removed from their own tumors and armed in the laboratory with a gene capable of producing a potent antitumor toxin, tumor necrosis factor.

Dr. Bernadine Healy was confirmed as NIH's 13th director on March 21. She was the first woman appointed to this post.

In August the National Center for Human Genome Research announced the start of a new, unified effort to develop a "framework" map of the human genome —expected to take 2 to 3 years to complete.

1992

The National Institute on Drug Abuse, National Institute on Alcohol Abuse and Alcoholism, and National Institute of Mental Health were transferred from the Alcohol, Drug Abuse, and Mental Health Administration to become part of the NIH.

Two components—NICHD and NIGMS—celebrated their 30th anniversaries on September 21 and October 17, respectively.

1993

NIH Director Bernadine Healy stepped down to return to the Cleveland Clinic Foundation.

The Clinical Center celebrated its 40th anniversary.

Sixteen university medical programs were launch sites for the 15-year, $625 million Women's Health Initiative. About 3,000 women will be enrolled at each center to investigate women's most common causes of death and disability.

Dr. Harold Varmus was appointed NIH's 14th Director.

FIC noted its 25th anniversary.

The National Center for Nursing Research became the 16th institute.

1994

Former director, Dr. James Shannon, died.

NHLBI scientists for the first time successfully transferred a normal cystic fibrosis gene into the cells lining a CF patient's lungs.

Researchers at NIEHS isolated the BRCA1 gene—responsible for about 5 percent of all breast cancers and 25 percent in women under age 30.

Dr. Martin Rodbell, NIEHS, shared the Nobel Prize in physiology or medicine for research on G proteins, key components of the communication system that regulates cellular activity.

1995

NLM unveiled the "Visible Man," a detailed atlas of human anatomy created from thousands of images of a human body collected by radiographic and photographic techniques.

NIAAA celebrated its 25th anniversary.

1996

The first multicenter trial of bone marrow transplantation in children with sickle cell disease demonstrated that the procedure can provide a cure for young patients that have a matched sibling, according to NHLBI-supported scientists.

DRG celebrated its 50th anniversary and NIEHS noted its 30th.

1997

Researchers with NHGRI completed a map of chromosome 7, an important milestone within the Human Genome Project.

DRG was renamed the Center for Scientific Review and DCRT became the Center for Information Technology.

Vice President Al Gore performed an "inaugural search," opening up free access on the world wide web to NLM's MEDLINE.

Results from the NIH-supported Dietary and Systolic Hypertension trial indicated that blood pressure can be swiftly and significantly lowered through a diet low in fat and high in vegetables, fruits, and low-fat dairy foods.

A team led by NHGRI scientists identified a defective gene that causes some inherited cases of Parkinson's disease.

Results from an NIH trial showed that a low-dose diuretic cuts by half the chance that an older person with high systolic blood pressure will develop heart failure. In those who had already had a heart attack, their chance of developing heart failure dropped by 80 percent.

A team led by NIH-funded scientists determined the complete genome sequence of the E. coli bacterium, a laboratory workhorse. This accomplishment gives researchers a powerful new tool for understanding fundamental questions of biological evolution and function.

On November 4, Vice President Al Gore and Senator Mark O. Hatfield attended the groundbreaking ceremonies for the new Clinical Center, which will be called the Mark O. Hatfield Clinical Research Center.

1998

Building 20, NIH's apartment building, was carefully demolished to make way for the new Mark O. Hatfield Clinical Research Center.

NICHD's new zebrafish facility opened. Zebrafish have become the mainstay of developmental biologists for studying the development of the vascular system and central nervous system, as well as the functional genomics of the zebrafish.

A large prevention trial conducted by NCI showed that long-term use of a moderate-dose vitamin E supplement substantially reduced prostate cancer incidence and deaths in male smokers.

In a cooperative endeavor (Neurolab) between NASA, NIH and others, astronauts on Space Shuttle Columbia conducted research on how the neurological system responds to the challenges of space flight.

Results from a NCI-sponsored clinical trial showed that women at high risk of developing breast cancer who took the drug tamoxifen had 49 percent fewer cases of breast cancer than those who didn't. Tamoxifen was hailed as the first drug to prevent breast cancer in women at high risk for the disease.

The new NIH Intramural Sequencing Center opened in Gaithersburg. NISC is a 14-institute consortium that is dedicated to large-scale sequencing of human and animal DNA.

NIDR celebrated its 50th anniversary, with a name change to the National Institute of Dental and Craniofacial Research.

Building 16, known as the Stone House, was renamed the "Lawton Chiles International House"; it will be the locus for international activities supported by FIC and other NIH and DHHS components.

Between 1992 and 1996, the rate of Sudden Infant Death Syndrome (SIDS) dropped by 38 percent, much of that likely being due to a 66 percent decrease during the same period in the number of U.S. infants being placed to sleep on their stomachs. A national Back to Sleep Campaign—encouraging parents to put their infants to sleep on their backs - was launched in 1994 by NICHD, in partnership with HHS and other organizations.

The complete sequence of two bacteria that are among the major causes of sexually transmitted diseases worldwide—Treponema pallidum, responsible for syphilis, and Chlamydia trachomatis, responsible for chlamydial infections—were obtained by two separate teams of scientists supported by NIAID and others.

NIDCD celebrated its 10th anniversary.

Senator John Glenn and six other astronauts spent nine days in space aboard NASA's Space Shuttle Discovery conducting about 83 scientific projects, the most research-intensive space journey yet. Glenn, NASA and others worked with NIA to develop the projects.

NIAID celebrated its 50th anniversary.

NHLBI's Framingham Heart Study celebrated its 50th anniversary.

An international team funded by NHGRI and others obtained the complete sequence of the 97-million-base genome of the roundworm, Caenorhabditis elegans. This marks the first time that scientists have spelled out the instructions for a complete animal which, like humans, has a nervous system, digests food, reproduces, and gets old, making it a very important organism in which to carry out studies that parallel human biology.

1999

The new South Entry to the Clinical Center opened, thus facilitating construction on the Mark O. Hatfield Clinical Research Center on the north face of Building 10.

A team of investigators led by an NIAID grantee discovered that a subspecies of chimpanzees native to west Africa are the origin of HIV-1, the virus responsible for the global AIDS pandemic.

Underlying vitamin D deficiency in postmenopausal women is associated with increased risk of hip fracture, according to a study supported by NIA and NCRR.

NIDA, NIMH, and NINDS moved into the new Neuroscience Center office building on Executive Boulevard, which some have dubbed "NIH North".

A meta-analysis study, led by an NICHD researcher, found that pregnant women infected with HIV could reduce the risk of transmitting the virus to their infants by about 50 percent if they deliver by cesarean section before they go into labor and before their membranes rupture.

NIH Director Dr. Harold Varmus convened the first meeting of the Director's Council of Public Representatives (COPR). The Council will provide advice and recommendations to, and consult with, the NIH Director regarding matters related to medical research, NIH's policies and programs, and public participation in NIH's activities. COPR was chartered in November 1998.

On June 9, President Bill Clinton unveiled the cornerstone for the new Dale and Betty Bumpers Vaccine Research Center, which initially will focus on accelerating the search for a vaccine against AIDS. Earlier, Dr. Varmus named Dr. Gary Nabel as the director of the new VRC, which currently exists as a "center without walls". The VRC is funded by NIAID and NCI and spear- headed by them and NIH's Office of AIDS Research.

NLM's MEDLINE added the 10 millionth journal citation to its database.

A joint Uganda—U.S. study, funded by NIAID, demonstrated a highly effective, affordable and practical strategy for preventing transmission of HIV from an infected mother to her newborn. A single-oral dose of the antiretroviral drug nevirapine given to the HIV-infected mother while in labor and another to her baby within three days of birth reduced the transmission rate by half compared with a similar short course of AZT.

Women with preeclampsia, a potentially fatal complication of pregnancy, were found to have an imbalance of two key chemical compounds that control blood pressure, prostacyclin and thromboxane, months before their symptoms appeared, according to NICHD scientists.

NIDA celebrated its 25th anniversary.

NIH announced its plan to establish a repository called PubMed Central for free electronic distribution of primary research reports in the life sciences. The new site would be integrated with NLM's widely used bibliographic site PubMed and is intended to be one of several repositories in an international system first proposed by NIH director Dr. Harold Varmus. PubMed Central would begin receiving, storing and distributing content—including peer—reviewed articles, preprints, and other screened reports from existing journals, new journals, and reputable scientific organizations—in January 2000.

Children born to mothers with untreated hypothyroidism during pregnancy were found to score lower on IQ tests than children of healthy mothers suggesting that early detection and treatment of hypothyroidism in pregnant women may be a critical part of prenatal care, according to a study funded by NICHD and others.

In October 1999, NIH announced a major research program involving 10 laboratories, called the Mouse Genome Sequencing Network, to map and sequence the DNA in the mouse genome.

A research effort led by NIAID scientists produced the first high-resolution genetic map of Plasmodium falciparum, the deadliest malaria parasite, which is responsible for the death of more than two million people annually.

Scientists supported by NHGRI along with groups in England and Japan completed the first sequence of a human chromosome, chromosome 22. Genes on chromosome 22 have been implicated in immune system function, congenital heart disease, and several cancers including leukemia.

The National Toxicology Program, headquartered at NIEHS, announced that Federal regulatory agencies—FDA, OSHA, EPA and CPSC—would accept, for the first time, an alternative way to test chemicals for allergic contact dermatitis that could reduce by thousands the number of guinea pigs needed for such tests.

After leading NIH for 6 years, Dr. Harold Varmus left to become the President and CEO of Memorial Sloan-Kettering Cancer Center in New York City.

2000

On January 1, Dr. Ruth Kirschstein, deputy director of NIH, became the acting director.

Scientists funded by NIDCR and NIAMS, along with an NCI scientist discovered that leptin, the product of the obesity gene, acts as a bone inhibitor by telling the brain to slow down the rate of bone formation, showing for the first time that the brain has a central role in controlling bone formation and density.

A team including NCI scientists and grantees used microarray technology to show that the most common form of non-Hodgkin's lymphoma (NHL), diffuse large B-cell lymphoma, is actually two distinct diseases, thus explaining why 40 percent of patients with this NHL can be cured through chemotherapy while others succumb to the disease. This is the first demonstration of a technology that promises to revolutionize cancer diagnosis as well as many other areas of research.

The NIEHS headquarters and laboratory Building 101 in Research Triangle Park, N.C., was renamed the Rall Building in honor of former NIEHS director, Dr. David Platt Rall.

NLM received Vice President Al Gore's Hammer Award for a series of improvements in its information services, including making its popular MEDLINE database of journal article references and abstracts free and easier for the public to use.

NIH launched the first phase of a consumer-friendly database, ClinicalTrials. gov, with information on more than 4,000 Federal and private medical studies involving patients and others at more than 47,000 locations nationwide. The new database may be reached at http://clinicaltrials.gov/.

CC and NIAID scientists demonstrated that the widely used herbal product St. John's wort could significantly compromise the effectiveness of a protease inhibitor often used to treat those infected with HIV.

An NIAID study showed that a nasal spray flu vaccine not only protected young children against the three strains of influenza for which the vaccine was designed to provide protection but also a flu strain not covered by the vaccine. It also protected the children against flu-related middle-ear infections.

Scientists supported by NHGRI and DOE along with the private company Celera completely sequenced the genome of the fruitfly Drosophila melanogaster, which is used to study a host of biological questions related to aging, development, learning, memory and more.

NIH's Office of Research on Minority Health and the Office of Research on Women's Health celebrated their tenth anniversaries.

An NHLBI-supported clinical trial showed that lowering the amount of salt for those who ate a "usual" American diet as well as those following the DASH diet—rich in vegetables, fruits and low-fat dairy foods and low in saturated fat, total fat and cholesterol—lowered blood pressure correspondingly for both those with and without hypertension, including African Americans.

NIGMS and the Indian Health Service announced plans to collaborate on a new program, Native American Research Centers for Health (NARCH), designed to promote, develop and support centers that will link the Native American community with organizations that conduct health research.

The international Human Genome Project public consortium—funded by NIH, DOE, and others—assembled a working draft of the sequence of the human genome. The information from this project has been completely, immediately, and freely released to the world with no restrictions on its use.

Researchers supported by NIGMS demonstrated that a simple and inexpensive change in basic surgical procedures—giving patients more oxygen during and immediately after surgery—can cut the rate of wound infections in half, thus saving millions of dollars in hospital costs by helping to prevent post-surgical wound infection, nausea and vomiting.

A team of scientists funded by NIAID determined the complete sequence of the genome of the bacterium—Vibrio cholerae—that causes cholera.

2001

Grantees of NIAID and NHGRI and others sequenced the entire genome of a deadly strain of E. coli, a bacterium that is emerging as a major public health threat through contaminated ground beef, milk, fruits and vegetables. By comparing the sequence of this strain with that of harmless strains of E. coli, scientists may learn why only some forms cause disease and then find ways to prevent harmful strains from causing disease.

A team of NHGRI and NCI scientists and others developed a new genetic test that can distinguish between two types of hereditary breast cancer—caused by BRCA1 and BRCA2 mutations—and sporadic breast cancer. The new approach uses microarray (gene chip) technology to analyze the activity of more than 5300 genes at once. This advance should ultimately help physicians diagnose the cause of a woman's breast cancer and guide decisions about the most effective treatments.

A team composed of scientists from NHGRI and NINDS, grantees of NHLBI and NIA, and others demonstrated that adult stem cells isolated from mouse bone marrow could become functioning heart muscle cells when injected into a damaged mouse heart. The new cells at least partially restored the heart's ability to pump blood.

NIAID grantees completed sequencing the genome of Streptococcus pyogenes, a bacterium that causes a wide variety of human diseases including strep throat, scarlet fever, pneumonia, toxic shock syndrome, blood "poisoning," acute rheumatic fever, rheumatic heart disease, and the flesh-eating disease known as necrotizing fasciitis. This information should aid scientists in developing new ways to prevent and treat these diseases.

Scientists from NICHD developed and, along with an NIDDK scientist and others, tested the first vaccine capable of protecting children ages 2 to 5 against typhoid fever. Seemingly the most effective typhoid vaccine ever developed, it is also virtually free of side effects. About 16 million people worldwide develop typhoid each year, and 600,000 die from it, mainly in developing countries without adequate sewage and sanitation.

Under a CRADA with the drug company Novartis, NCI scientists found that a new drug known as Gleevec was effective against chronic myelogenous leukemia (CML) in patients for whom standard treatments had failed. (CML is a disease in which too many white blood cells are made in the bone marrow, the spongy tissue inside the large bones in the body.) NCI funded the lion's share of the basic research that led to the discovery and development by Novartis of Gleevec, the first anti-cancer drug specifically developed to target the molecular problem that causes a particular type of cancer.

NHGRI scientists and others developed a method that combined microarray (gene chip) technology with a form of artificial intelligence. This enabled them to tell the difference between four childhood cancers that often look alike—neuroblastoma, Ewing's sarcoma, non-Hodgkin lymphoma (Burkitt's lymphoma) and rhabdomyosarcoma. Because the treatments for these tumors are quite different, an accurate diagnosis can be critical for a child's survival. This study should help lead to the discovery of genes that are altered in these tumors and ultimately to the development of effective new treatments.

Grantees of NHLBI and NIA found that human heart muscle cells can regenerate after a heart attack. This finding opens up the possibility of repairing heart muscle damage after a heart attack.

Animal studies by NIDA researchers found that craving for cocaine seems to increase, rather than decrease, in the days and months after drug use has stopped. This phenomenon helps explain why addiction is a chronic, relapsing disease.

People at high risk for type 2 diabetes can sharply lower their chances of getting the disease by losing weight (5 percent to 7 percent of their body weight) and by getting 30 minutes of walking or other moderate exercise every day, according to the findings of a clinical trial sponsored by NIDDK.

On August 9, President Bush announced that Federal funds could be used to support research using existing lines of human embryonic stem cells that meet certain criteria. NIH then developed a registry of the known human embryonic stem cell lines so researchers could identify in their applications for funding which sources of stem cells they plan to use.

An NEI-sponsored clinical trial showed that people at high risk of developing advanced stages of age-related macular degeneration (AMD) significantly lowered that risk by taking a high-dose combination of zinc and the antioxidants vitamin C, vitamin E and beta-carotene. These nutrients are the first effective treatment to slow the progression of AMD, a leading cause of visual impairment and blindness in Americans 65 years of age and older.

2002

NCRR-supported scientists were part of a team that cloned the world's first "knockout" pigs—ones with a particular gene removed. The gene they removed was for a molecule on the surface of the pig cells that the human immune system recognizes and attacks, leading to the failure of transplanted tissues or organs.

A team of NICHD and other scientists developed the first vaccine against Staphylococcus aureus, a major cause of infection and death among hospital patients.

People with elevated levels of homocysteine in the blood had nearly double the risk of Alzheimer's disease (AD), according to a team of scientists supported by NIA and NINDS. The findings, in a group of participants in NHLBI's long-running Framingham Study, are the first to tie homocysteine levels measured several years before with a later diagnosis of AD and the other dementias, providing some of the most powerful evidence yet of an association between high plasma homocysteine and later significant memory loss.

NIAID released its Counter-Bioterrorism Research Agenda, a document describing an accelerated research plan for the most threatening agents of bioterrorism. The agenda outlines the research NIAID will undertake to help protect civilian populations from diseases such as smallpox, anthrax and plague should those who wish to do harm unleash them intentionally.

Results of an NIAID study indicate that the existing U.S. supply of smallpox vaccine—15.4 million doses—could successfully be diluted up to five times and retain its potency, effectively expanding the number of individuals it could protect from the contagious disease. The success of this study puts us one step closer to the goal of having enough vaccine for every American if needed to respond to a potential outbreak.

Dr. Elias Zerhouni became the 15th director of the National Institutes of Health.

The international Mouse Genome Sequencing Consortium, jointly funded by NHGRI and several NIH institutes along with the Wellcome Trust in the United Kingdom, announced that it had assembled and deposited into public databases an advanced draft sequence of the mouse genome, the genetic blueprint for the most important animal model in biomedical research. The sequence is freely available on the Internet.

Dr. Roderic I. Pettigrew was named the first director of NIH's new National Institute of Biomedical Imaging and Bioengineering.

Researchers used whole-genome sequencing technology and computational methods to genetically compare two important isolates of the anthrax bacterium: the well-known Ames strain and an isolate from the 2001 Florida anthrax attacks. These techniques will enable researchers to more accurately trace the origin of individual bacterial strains, determine if those strains have been genetically modified, and assess differences in their ability to cause disease or resist antibiotics. NIAID teamed with the Office of Naval Research, the National Science Foundation, and other agencies to fund the research.

NHLBI stopped early a major clinical trial of the risks and benefits of combined estrogen and progestin in healthy menopausal women due to an increased risk of invasive breast cancer. The large trial, a component of the Women's Health Initiative (WHI), also found increases in coronary heart disease, stroke, and pulmonary embolism in study participants on estrogen plus progestin compared to women taking placebo pills. There were some benefits of estrogen plus progestin, including fewer cases of hip fractures and colon cancer, but on balance the harm was greater than the benefit.

NIH licensed a new technology that allows physicians and researchers to make detailed, three-dimensional maps of nerve pathways in the brain, heart muscle fibers, and other soft tissues. The new imaging technology, called Diffusion Tensor Magnetic Resonance Imaging (DT-MRI), was invented by researchers now at NICHD.

A new approach to cancer treatment that replaces a patient's immune system with cancer-fighting cells can lead to tumor shrinkage. NCI researchers demonstrated that immune cells, activated in the laboratory against patients' tumors and then administered to those patients, could attack cancer cells in the body. The experimental technique, known as adoptive transfer, has shown promising results in patients with metastatic melanoma who have not responded to standard treatment.

NIAID-supported researchers proved conclusively that the malaria-causing parasite Plasmodium falciparum became resistant to the anti-malarial drug chloroquine through mutations in a single parasite gene. This finding has potentially important implications for malaria treatment and control.

An international research consortium of NHGRI, other NIH components, and other countries launched a public-private effort to create the next generation map of the human genome. Called the International HapMap Project, this new venture is aimed at speeding the discovery of genes related to common illnesses such as asthma, cancer, diabetes and heart disease.

2003

The International Human Genome Sequencing Consortium, led in the United States by NHGRI and the Department of Energy, completed the Human Genome Project more than two years ahead of schedule and for a cost substantially less than the original estimates. The international effort to sequence the three billion DNA letters is considered by many to be one of the most ambitious scientific undertakings of all time. The first draft of the human sequence was completed in June 2000. Researchers have now produced a "finished" sequence, which covers about 99 percent of the human genome's gene-containing regions, and has been sequenced to an accuracy of 99.99 percent. All of the sequence data have been deposited into public databases and made freely available to scientists around the world, with no restrictions on their use or redistribution.

The complete genetic blueprint of Bacillus anthracis—the microbe that gained notoriety during the 2001 anthrax mail attacks—has been completed by NIAID-funded researchers. This bacterium, which can cause potentially fatal inhalational anthrax, differs very little from a common soil bacterium related to it. Scientists hope

that the genetic differences between these two may reveal valuable clues to its vulnerabilities.

NHLBI published new clinical practice guidelines for the prevention, detection, and treatment of high blood pressure—a major risk factor for heart disease and the chief risk factor for stroke and heart failure. The guidelines define a new blood pressure category called "prehypertension" that includes about 22 percent of American adults, or about 45 million people. Americans' lifetime risk of developing hypertension is greater than previously thought, according to the new guidelines. Medications and lifestyle changes are both crucial parts of treatment.

Researchers supported by NIMH found a gene called 5-HTT that influences whether people become depressed when faced with major life stresses such as relationship problems, financial difficulties and illness. The gene by itself does not cause depression, but it does affect how likely people are to get depressed when faced with major life stresses. Another study led by NIAAA researchers found that this same gene affects drinking habits in college students. These studies are major contributions toward understanding how a person's response to their environment is influenced by their genetic makeup.

A team led by NIDCR and NICHD researchers discovered that "baby" teeth, the temporary teeth that children begin losing around their sixth birthday, contain a rich supply of stem cells in their dental pulp. The cells, named SHED, remain alive inside the tooth for a short time after it falls out of a child's mouth. This easily accessible source of stem cells could be readily harvested for research. Scientists hope they can learn to manipulate them to repair damaged teeth, induce the regeneration of bone, and treat neural injury or disease.

Researchers supported by NICHD, NIGMS, NHLBI and NIDCR discovered how an embryo attaches to the wall of the uterus in what may be one of the earliest steps needed to establish a successful pregnancy. After an egg is fertilized, a specialized protein called L-selectin on the embryo surface binds to carbohydrates on the uterine wall. Scientists think that this interaction slows the embryo down to a complete stop so it can then attach to the wall of the uterus. The finding may lead to insights into infertility and early pregnancy loss.

An international research team funded by NINR found that filters made from old cotton saris cut the number of cholera cases in rural Bangladesh villages almost in half. Other inexpensive cloth should work just as well in other parts of the world where cholera is endemic. Cholera is a waterborne disease that causes severe diarrhea and vomiting, killing thousands of people around the world every year. This simple preventive measure has the potential to make a significant impact on a global health problem.

NIH director Dr. Elias Zerhouni names five new institute directors: Dr. Ting-Kai Li at the National Institute on Alcohol Abuse and Alcoholism; Dr. Thomas Insel at the National Institute of Mental Health; Dr. Nora Volkow at the National Institute on Drug Abuse, Dr. Jeremy Berg at the National Institute of General Medical Sciences; Dr. Story Landis at the National Institute of Neurological Disorders and Stroke.

President George W. Bush visits NIH on Feb. 3 to unveil Project BioShield, a $6 billion, 10-year effort to protect the public from various weapons of bioterrorism.

The FY 2003 appropriation for NIH completes a 5-year doubling of the NIH budget that began in 1998.

Construction begins on a new Perimeter Security System including a fence around the Bethesda campus.

Construction begins on the Bldg. 33 Complex, to include a parking garage and 150,000 gross square foot laboratory for work on infectious agents that might be used in bioterrorism.

Dr. Zerhouni announces the NIH Roadmap for Medical Research, a comprehensive plan whose purpose is to identify the major scientific opportunities and gaps in medical research that no single institute or center at NIH could tackle alone.

2004

NIH opens the Mark O. Hatfield Clinical Research Center, a 240-bed successor to the NIH Clinical Center, which opened in 1953. It is the world's largest facility dedicated to clinical research. The 870,000-square-foot addition welcomed occupants of its research wings in fall 2004, and was to admit its first patients in early January 2005.

The NIH Roadmap for Medical Research, a coordinated effort to speed the results of bench research to the patient bedside, marks its first anniversary, which includes the award of 9 grants to the inaugural class of winners of the NIH Director's Pioneer Awards.

NIH director Dr. Elias Zerhouni announces an NIH proposal to enhance public access to taxpayer-supported research by creating an online, searchable archive of all NIH-funded publications within 6 months of their appearance in journals.

NIH proposes enhancements to its rules governing potential conflicts of interest on the part of employees, thereby resolving public and congressional concerns about the outside activities of NIH staff.

NIH launches the Neuroscience Blueprint, a framework to enhance cooperative activities among 14 NIH Institutes and Centers that support research on the nervous system. The ultimate goal of the Blueprint is to accelerate neuroscience research to reduce the burden of nervous system disorders and maintain a healthy nervous system throughout life.

The Council of Public Representatives to the NIH director (COPR) holds a Public Trust Workshop aimed at increasing public participation in clinical research. COPR advocates building trust through community partnerships, building relationships with patients, building partnerships with community providers and building trust in both scientists and NIH scientific research.

An international clinical trial concluded that women should consider taking letrozole after 5 years of tamoxifen treatment to continue to reduce the risk of recurrence of breast cancer. This advance in breast cancer treatment will improve the outlook for many thousands of women. NCI supported the U.S. portion of the

study, which offered one more example of the ability to interrupt the progression of a cancer using a drug that blocks a crucial metabolic pathway in the tumor cell.

As of July 2003, about 10 million American women were taking some form of hormone therapy, including approximately 6.7 million taking estrogen alone and 3.3 million taking estrogen plus progestin. A large, multi-center prevention study of estrogen-alone hormone therapy in healthy, postmenopausal women without a uterus, was stopped in February 2004 after researchers found that estrogen-alone had no effect on coronary heart disease risk, but increased the risk of stroke. The study, part of the NHLBI-sponsored Women's Health Initiative (WHI), also found that estrogen-alone therapy significantly increased the risk of deep vein thrombosis, had no significant effect on the risk of breast or colorectal cancer, and reduced the risk of hip and other fractures. In addition, among older women in the study, estrogen-alone therapy did not prevent cognitive decline.

The International Human Genome Sequencing Consortium, led in the United States by the National Human Genome Research Institute and the Department of Energy, published its scientific description of the finished human genome sequence, reducing the estimated number of human protein-coding genes from 35,000 to only 20,000-25,000, a surprisingly low number for our species.

Adding to a developing body of research examining a possible link between diabetes and cognitive decline, a long-term study supported by NIA found that diabetes mellitus was linked to a 65 percent increased risk of developing Alzheimer's disease (AD). These results are among the first to examine how certain cognitive systems, including memory for words and events, the speed of processing information, and the ability to recognize spatial patterns, decline in people with diabetes, while others do not. Further research, some currently under way, will tell researchers whether therapies for diabetes may in fact play a role in lowering risk of AD or cognitive decline.

From language to literature, from music to mathematics, a single protein, known as mBDNF, appears central to the formation of the long-term memories needed to learn these and all other disciplines. Most of what we accomplish as human beings depends on what we learn. This discovery, led by scientists at NICHD, brings the possibility of studying this protein system in people with learning and memory disorders and perhaps designing new medications that might help to compensate for these problems.

2005

People with type 1 diabetes can lower their risk of heart disease and stroke by about 50% by tightly controlling their blood glucose levels, according to a study supported by NIDDK and NCRR. The findings were based on a follow-up study of patients who took part more than a decade ago in the Diabetes Control and Complications Trial, a major clinical study funded by NIDDK and other NIH components along with Genentech, Inc. Continuing studies will reveal whether the same applies to those with type 2 diabetes, the more prevalent form of the disease.

NCI and NHGRI launched a comprehensive effort called The Cancer Genome Atlas (TCGA) to accelerate an understanding of the molecular basis of cancer using genome analysis technologies. A pilot project involves a few types of cancer chosen for their value in helping to determine the feasibility of a possible larger-scale project. The project will develop and test the complex science and technology framework needed to systematically identify and characterize genomic changes associated with cancer.

An international team supported by NHGRI published the genome sequence of the dog. Because of selective breeding over the past few centuries, modern dog breeds are a model of genetic diversity, from 6-pound Chihuahuas to 120-pound Great Danes, from high-energy Jack Russell Terriers to mild-mannered basset hounds, and from the herding instincts of Shetland sheepdogs to pointers pointing. However, selective breeding has also caused many dog breeds to be predisposed to genetic disorders including heart disease, cancer and blindness. In combination with the human genome, the dog genome sequence will help researchers identify genetic contributors to several diseases.

Prince Charles and his wife, the Duchess of Cornwall, visited NIH on November 3 for a briefing on osteoporosis. The Duchess of Cornwall's interest in osteoporosis—her mother and grandmother died as a result of the disease—spurred the visit. Sponsored by NIAMS, the meeting explored opportunities to spread the messages of the Bone Health and Osteoporosis: A Surgeon General's Report.

President George W. Bush made his fourth visit to NIH in less than 3 years on November 1 to announce the government's pandemic influenza preparations and response. His previous visit, on January 26, was for a 40-minute town hall-style meeting to emcee a discussion with five citizens on the topic "Strengthening Health Care."

NIH launched a new state-of-the-art way for applicants to submit their grant applications electronically. Beginning with the receipt date of Dec. 1, 2005, NIH is requiring all its SBIR/STTR grant applicants to electronically submit their competing grants. NIH plans to transition all of its competing grant programs from paper to electronic by May 2007.

The International HapMap Consortium, a public-private effort to chart patterns of genetic variation in the world's population, published the human haplotype map, or HapMap. With more than 1 million markers of genetic variation, the HapMap is a comprehensive catalog of human genetic variation showing "neighborhoods" of correlated genetic variation, or haplotypes, across the entire human genome. Researchers will be able to identify genetic contributions to common diseases far more efficiently using HapMap data than with traditional approaches.

NIH launched a major new program, the Institutional Clinical and Translational Science Awards (CTSAs) program, to encourage the development of clinical and translational science, so that new treatments can be developed more efficiently and delivered more quickly to patients.

An HIV/AIDS vaccine developed by scientists at NIAID's Dale and Betty Bumpers Vaccine Research Center moved into its second phase of clinical testing in October. This vaccine contains synthetic genes representing HIV subtypes found in Europe, North America, Africa and Asia that account about 85% of HIV infections worldwide.

Rates for new cases of kidney failure stabilized after 20 years of annual increases from 5 to 10%, according to research from NIDDK. Credit likely goes to clinical strategies proven in the 1990s to significantly delay or prevent kidney failure: angiotensin-converting enzyme inhibitors (ACE-inhibitors) and angiotensin receptor

blockers (ARBs), which lower protein in the urine and are thought to directly prevent injury to the kidneys' blood vessels; and careful control of diabetes and blood pressure. The launch of private and government programs to improve care and increase awareness, including NIDDK's National Kidney Disease Education Program (NKDEP), likely also had an impact.

The nation's leading cancer organizations reported in October that Americans' risk of dying from cancer continues to decline and that the rate of new cancers is holding steady. Observed cancer death rates from all cancers combined dropped 1.1% per year from 1993 to 2002. NCI announced the results in the "Annual Report to the Nation on the Status of Cancer, 1975-2002" in collaboration with the Centers for Disease Control and Prevention, the American Cancer Society, and the North American Association of Central Cancer Registries.

NIH celebrated the second anniversary of progress guided by the NIH Roadmap for Medical Research in September. In fiscal year 2005, NIH funded $235 million in new and continuing NIH Roadmap projects. Key NIH Roadmap accomplishments include:

- The establishment of advanced centers in nanomedicine.
- The Molecular Libraries Screening Center Network began work in June 2005.
- Research Teams of the Future awards were granted through fiscal year 2006 to fund 21 Exploratory Centers for Interdisciplinary Research throughout the country.
- The launch of the Re-engineering the Clinical Research Enterprise.

Within a day of Katrina's passage, NIH director Dr. Elias Zerhouni convened the first in a series of emergency meetings at which clinical directors, nursing and administrative leaders rapidly hammered out ways NIH could help. In partnership with the American Association of Medical Colleges, NIH created and activated a telemedicine brain trust for specialty medical consultations over a telephone hotline. An advance team and medical team numbering about 50 people deployed temporarily to a field hospital in Mississippi. In addition, the Clinical Center made 100 beds of "surge capacity" available for patients who might need to be transferred from the affected areas, such as young cancer patients who would need specialized services.

The Chimpanzee Sequencing and Analysis Consortium, which is supported in part by NHGRI, described its landmark analysis comparing the genome of the chimp (Pan troglodytes) with that of humans (Homo sapiens). The chimp sequence draft represents the first non-human primate genome. Our closest living relatives share 96% of our DNA sequence.

Dr. Zerhouni announced the latest and final regulations to prevent conflicts of interest at NIH on August 25. In the works since interim final regulations were published in February of 2004, the new revised standards became effective on August 31, when they appeared in the Federal Register.

Computer models developed by the NIGMS-funded Models of Infectious Disease Agent Study (MIDAS) research network found that a carefully chosen combination of public health measures, if implemented early, could stop the spread of an avian flu outbreak at its source. The researchers found that antiviral treatment is a critical component of a multi-pronged approach.

An international group of researchers working in more than 20 laboratories around the globe and funded in part by NIAID sequenced the genomes of three parasites that cause deadly insect-borne diseases: African sleeping sickness, leishmaniasis and Chagas disease. Knowing the full genetic make-up of the three parasites might lead to better ways to treat or prevent the diseases they cause.

The Women's Health Study, a long-term clinical trial funded by NHLBI and NCI, found that vitamin E supplements don't protect healthy women against heart attacks and stroke. They also had no effect on the most common cancers in women or on total cancers.

The Protein Structure Initiative (PSI) completed its first 5-year phase and moved into its second. The PSI aims to figure out the three-dimensional shapes of proteins, with the long-term goal of being able to predict most protein structures from their DNA sequences. More than 1,100 protein structures were solved in the PSI's first phase, which was dedicated to figuring out how to process proteins and determine their three-dimensional structures more efficiently. Phase 2 is the production phase, in which thousands more protein structures will be solved and put into the Protein Data Bank (http://www.rcsb.org/pdb/), a public repository with powerful tools for processing protein structure information.

NHGRI announced 13 more organisms that the Large-Scale Sequencing Research Network will target, including 9 mammals, as part of its ongoing effort to produce genomic data that will expand biological knowledge and improve human health.

The Edmond J. Safra Family Lodge opened its doors to guests on Wednesday, June 1. This new addition to the NIH campus offers a temporary residence for families and loved ones of adult patients who are receiving care at the NIH Clinical Center.

Using New Bioshield Authorities, NIAID awarded 10 grants and 2 contracts totaling approximately $27 million to fund development of new therapeutics and vaccines against some of the most deadly agents of bioterrorism including anthrax, botulinum toxin, Ebola virus, pneumonic plague, smallpox and tularemia. Project Bioshield, which was signed into law on July 21, gives federal agencies new tools to accelerate research on medical countermeasures to safeguard Americans against chemical, biological, radiological or nuclear attack.

Researchers funded by NIH were asked to begin voluntarily submitting their manuscripts on May 2, 2005 to the National Library of Medicine's PubMed Central upon acceptance for publication. "Public access" to peer-reviewed, NIH-funded research publications will enable health care providers, educators and scientists to more easily exchange and search for research results. The public will also have greater access to published material about the medical research their tax dollars support.

The Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT), a long-term, multi-center trial of antihypertensive therapies funded by NHLBI, found that diuretics work better than newer therapies in treating high blood pressure and reducing the risk of heart disease in both black and non-black patients. The large study, with 33,357 participants, concluded that diuretics should be the first therapy for most patients with high blood pressure.

Three independent research teams supported by NEI found a gene, called complement factor H (CFH), that affects a person's risk of developing age-related macular degeneration (AMD), the leading cause of blindness in people over age 60. One team, which included NIH's own researchers, found that people with this variant of the CFH gene are more than seven times more likely to develop the disease.

The Heart Truth, a national awareness campaign about women's heart disease sponsored by NHLBI, hosted the Red Dress Collection 2005 Fashion Show at Olympus Fashion Week in New York City on February 4, National Wear Red Day. First Lady Laura Bush, the national ambassador for NHLBI's campaign, joined Sarah Ferguson, the Duchess of York, and NHLBI director Dr. Elizabeth Nabel at a press event at the Time Life building in New York to kick off the fashion show. Made possible by Johnson & Johnson, Celestial Seasonings and Swarovski, the show was hosted by actress Vanessa Williams and included 26 of America's most influential designers along with a star-studded cast of celebrity models. The fashion show brought to life the Red Dress, the national symbol for women and heart disease awareness. In a survey was conducted by Harris Interactive in January, 60% of all the women surveyed agree that the Red Dress makes them want to learn more about heart disease, 25% recalled the Red Dress as the national symbol for women and heart disease and 45% agreed that it would prompt them to talk to their doctor and/or get a check-up.

2006

NCI-funded research spanning nearly 2 decades helped lead to FDA approval for a vaccine to prevent cervical cancer, a disease that claims the lives of nearly 4,000 women each year in the United States. It is the first cancer vaccine approved by the FDA.

NHLBI's nearly half-century commitment to exploring innovative mechanical approaches for treating damaged hearts led to the development of the first totally implanted artificial heart, approved by FDA in September 2006.

The NIH Office of Technology Transfer announced that products and processes invented by NIH scientists generated close to $100 million in royalties in 2005, nearly double $56 million-plus earned by NIH inventions the previous year. The top royalty earner is the invention of a Taxol-coated stent, which helps more than half a million Americans each year avoid bypass surgery.

On May 2, NIH dedicated a new research facility for studying globally important infectious diseases. NIAID's new C.W. Bill Young Center for Biodefense and Emerging Infectious Diseases will house studies of naturally occurring infectious diseases, infectious agents that might be used for bioterrorism and potential vaccines.

A multicenter research team, funded in part by NHGRI, completed the draft genome sequence of the rhesus macaque monkey and deposited the information into free public databases. The macaque is the second non-human primate, after the chimpanzee, to have its genome sequenced. Overall, the macaque shares about 92-95% of its genome sequence with humans. The genome sequence will facilitate research in neuroscience, behavioral biology, reproductive physiology, endocrinology, and cardiovascular studies.

NIH announced the launch of the first clinical studies under the Rare Diseases Clinical Research Network. The network unites more than 300 investigators at dozens of research centers nationwide to study more than 40 rare diseases, most of which are difficult to diagnose and treat because they are so poorly understood. The new initiative will help move discoveries more quickly to patients.

As part of the largest hypertension clinical trial conducted to date, researchers began a comprehensive outreach program to improve high blood pressure control nationwide. About 150 physicians in 34 states and Washington, DC, have completed training to educate other physicians in their communities. Their goal is to help doctors and patients prevent and better treat high blood pressure.

The drug misoprostol was shown to provide a safe, convenient, and inexpensive way to prevent postpartum hemorrhage, a major killer of women in developing countries. In a clinical study conducted in rural villages in India, women who received the drug after birth were less likely to have serious postpartum bleeding, and had significantly lower average blood loss, than women who received placebo. The study was funded by the Global Network for Women's and Children's Health Research, a public-private partnership between NICHD and the Bill and Melinda Gates Foundation.

Leading scientists and experts on women's health joined study participants for a 2-day conference at NIH. Attendees discussed the findings, public health impact, and future directions of the Women's Health Initiative—the largest and most comprehensive study of postmenopausal women's health ever conducted in the United States.

The NIH Pathway to Independence Award program introduced a new opportunity for promising postdoctoral scientists to receive both mentored and independent research support from the same award. Announced in January, the program answers a National Academy of Sciences call for new ways to help early-career scientific investigators progress from postdoctoral studies to running their own research programs.

NIH created a plan for continuity of operations should a pandemic flu outbreak occur. The goal is to maintain critical operations and protect patients, visitors, and employees—as well as animals and ongoing research—in the event of widespread infectious disease or other emergencies.

The first comprehensive analysis of an animal's reaction to the 1918 influenza virus provided new insights into this deadly flu, which disproportionately killed young people at the prime of life. NIAID-funded scientists found that the 1918 virus triggers a hyperactive immune response that may be the key to its lethal effects. A deeper understanding of the 1918 virus will aid efforts to develop improved therapies against future influenza threats, including the H5N1 avian influenza virus.

The U.S. House of Representatives passed the National Institutes of Health Reform Act of 2006 by a vote of 414 to 2 on September 26; the U.S. Senate passed an amended version by unanimous consent on December 8. The House approved the Senate version by voice vote on December 9. The legislation—NIH's third omnibus reauthorization in history and first since 1993—affirmed the importance of NIH and its vital role in advancing biomedical research to improve the health of the Nation.

NIH Director Dr. Elias Zerhouni endorsed the conclusions of a National Academies report on women in science, which proposed that immediate, decisive action must be taken to maximize the potential of women scientists. The report found that women currently face barriers to hiring and promotion in research universities in

many fields of science and engineering, which deprives the nation of an important source of talent and may reduce U.S. competitiveness in the global marketplace.

An imaging molecule known as FDDNP binds to abnormal proteins in the brain and shows promise for enabling early and reliable diagnosis of Alzheimer's disease. The molecule was developed and tested by researchers supported in part by NIA, NCRR, and NIMH. When administered to patients before a brain scan, the molecule helps to distinguish among people who are healthy, those with Alzheimer's disease, and those with mild cognitive impairment, which sometimes progresses to Alzheimer's disease.

Thirteen recipients of the 2006 NIH Director's Pioneer Award—5-Year, $2.5 million grants that support highly innovative research—were announced at the second annual Pioneer Award Symposium. Now in its third year, the award is a key component of the NIH Roadmap for Medical Research.

NIEHS-supported researchers announced that they had successfully sequenced the DNA of 15 mouse strains most commonly used in biomedical research. More than 8.3 million tiny genetic variations called single nucleotide polymorphisms (SNPs) were discovered among the 15 genomes. The new data will help researchers better understand complex genetic traits, such as why some individuals are more susceptible to certain diseases, and how environmental agents influence the development of disease.

2007

President George W. Bush visited NIH on January 17, touring a cancer research laboratory and participating in a discussion on cancer prevention. It was his fifth visit to the NIH campus in the past 4 years. The president praised the agency's work, touting the new vaccine against cervical cancer. He was briefed on the Cancer Genome Atlas Project, a 3-year, $100 million collaboration between NCI and NHGRI to create a trove of molecular data describing the genomic changes that occur in all types of cancer.

An experimental vaccine—originally created and tested over the past 2 decades by NIAID scientists—appears safe and effective in preventing hepatitis E, a sometimes-deadly viral disease prevalent in developing countries. A clinical trial involving nearly 2,000 healthy adults in Nepal, where the virus is widespread, found that the vaccine was nearly 96% effective in preventing hepatitis E during a follow-up period of about 2 years.

NINDS launched the new Neurological Emergencies Treatment Trials (NETT) network, a nationwide clinical study that will look at emergency interventions for stroke, massive seizure, brain or spinal cord injury, and other major emergencies that affect the brain and nervous system. The long-term goal of the study, conducted in ambulances and hospitals across the country, is to improve medical care in the first minutes and hours after neurological emergencies occur.

By modifying only 4 genes in human skin cells, researchers supported by NCRR and NIGMS found that they could "reprogram" the cells to give them the characteristics of embryonic stem cells. This major advance could open doors to innovative therapies in the future, where people's own cells might be reprogrammed and used to repair their damaged tissues and organs.

EUREKA, a new funding initiative to help researchers with original ideas, was launched by 5 institutes. EUREKA—exceptional, unconventional research enabling knowledge acceleration—awards seek to raise the profile of paradigm-shifting concepts that might otherwise get overlooked.

A collaborative effort by 3 international research teams uncovered new clues about why some people develop type 2 diabetes and others don't. The NIH-funded research relied on a relatively new method, called a genome-wide association study (GWAS), which rapidly and cost effectively analyzes and compares genetic differences between people with and without specific illnesses. The scientists identified 4 new genetic risk factors for type 2 diabetes.

NIH Director Dr. Elias Zerhouni established an NIH-wide working group to address the issues that surround GWAS research, which holds tremendous promise for uncovering new and more effective methods for preventing, diagnosing, and treating disease. Because GWAS science is so new, policies for collecting, storing and using GWAS data have not yet been set. The new working group will gather feedback from the public, examine important issues, and draft an NIH policy.

The International HapMap Consortium, funded in part by NHGRI, published analyses of its second-generation map of human genetic variation. The revised map contains more than 3.1 million genetic variants—3 times the number reported in the initial HapMap of 2005. The improved HapMap will help researchers find DNA variants that influence the risk of disease and other traits.

NIH Director Dr. Elias Zerhouni met with nearly 200 members of the scientific community to hear comments on NIH peer review, the process of evaluating research grant applications. Over the last 60 years, peer review has been examined several times. The current effort to revitalize the process came as federal funding had receded, the number of experienced reviewers had dwindled, and grant application volume had increased in number and complexity.

The Human Microbiome Project, part the NIH's Roadmap for Medical Research, will explore the role of the trillions of microbes that live within or on the human body. The "human microbiome" is the collective genomes of all these organisms. By analyzing these genomes, the scientists hope to discover what microbial communities exist in different parts of the human body and explore how they change in health and disease.

With this year's NIH Director's Pioneer Awards and the inaugural class of NIH Director's New Innovator Awards, the agency made a major investment in the future of science, distributing 5-year grants totaling more than $105 million to 41 investigators. This is the first group of New Innovator Awards and the fourth group of Pioneer Awards. Both programs are part of an NIH Roadmap initiative that tests new approaches to supporting research.

Scientists identified a tiny, unchanging region on an AIDS virus protein that may be the key to neutralizing the virus. A multi-site research team, including scientists from NIAID and NCI, used X-ray crystallography to take detailed 3-D snapshots of an antibody grabbing onto this stable viral region, which HIV uses to latch onto and infect T cells. Discovery of this potential viral weak spot could have a profound impact on development of an AIDS vaccine.

The Clinical and Translational Science Award (CTSA) consortium, funded by NCRR, added 12 more academic health centers to the 12 announced in 2006. When fully implemented in 2012, 60 institutions will be linked together to energize the discipline of clinical and translational science.

In a September 12 ceremony in the U.S. Capitol, NIH and NASA signed a memorandum of understanding that will help American scientists use the International Space Station to answer questions about human health and disease. NIH Director Dr. Elias Zerhouni and NASA Administrator Dr. Michael D. Griffin signed a pact to collaborate on space-related health research.

NIH research was featured in a new TV series, "Tomorrow's Medicine Today." NIH Director Dr. Elias Zerhouni served as guest-co-host of the discussion shows, taped at Montclair State University studios in New Jersey. Each episode featured interviews with NIH Institute or Center directors, who invited extramural scientists to present their research in lay terms for a general audience.

The NIH Council of Councils, a new advisory body to the NIH Director, convened for the first time on November 8. Created by the NIH Reform Act of 2006, the Council oversees Common Fund expenditures, which pay for broad, trans-NIH initiatives that need support no single institute or center could offer. Council members represent the advisory councils of all 27 Institutes and Centers plus 3 ad hoc representatives. Their mission is to advise the NIH Director about which cross-cutting initiatives to support.

NIH's Public Trust Initiative launched its Partners in Research Program, a unique opportunity for scientists to team up with community organizations. Announced in fall 2007 and set to award grants in 2008, the 2-year pilot was fast-tracked. The goals of the partnerships are to better communicate research results and to make sure the health care needs and interests of the community are included in development of research programs.

A draft environmental impact statement for expansion of the National Naval Medical Center (NNMC) to accommodate Walter Reed Army Medical Center's move to Bethesda was released in mid-December 2007, launching a 45-day period for public comments. Between 2,500 and 4,000 workers are expected to be added to the existing NNMC and tenant staff of 7,500, and NNMC outpatient visits are expected to double to about 4,000 per weekday, which is expected to have a major impact on traffic congestion in the area.

2008

Through legislation enacted by Congress, NICHD was renamed the Eunice Kennedy Shriver National Institute of Child Health and Human Development at the institute's 45th anniversary celebration. In the early 1960s, Shriver persuaded her brother, President John F. Kennedy, to include the proposal for an NIH institute focusing on child health and human development in his first health message to Congress. NICHD was then established in 1963.

Two large NIH-funded clinical trials found that taking vitamin E, vitamin C, or selenium does not reduce the risk of prostate cancer or other cancers in older men, as some previous studies had suggested. The results highlight the fact that dietary supplements can sometimes seem beneficial in small observational studies, but large, carefully controlled trials are needed to test whether they really live up to their hoped-for benefits.

NIH began a new process that provides the public with detailed funding information for 215 major areas. Called Research, Condition, and Disease Categorization (RCDC), the new process uses knowledge management and computerized, standardized tools to provide consistent and transparent NIH research funding information.

On May 19, NIH's Office of the Director, Office of Rare Diseases, Clinical Center, and NHGRI launched the Undiagnosed Diseases Program. A trans-NIH initiative, it will focus on the most puzzling medical cases referred to the Clinical Center by physicians across the nation.

NIH-funded scientists identified genetic variations that put people at risk for several common and complex disorders, including breast cancer, gout, lung cancer, schizophrenia, glioblastoma, and blood cholesterol and lipid levels. Their successes relied on genome-wide association studies (GWAS), which scan the genomes of large numbers of people to find genetic variations associated with a particular disease.

On June 2, U.S. Senators Barbara Mikulski (D-MD) and Benjamin Cardin (D-MD), along with NIH Director Dr. Elias Zerhouni, visited NIH's newest research facility, the Biomedical Research Center (BRC) in Baltimore. The approximately 500,000-square-foot, 2-tower BRC is a leased building on the Johns Hopkins Bayview campus, where NIA and NIDA have long conducted intramural research in other facilities.

The NIH Gateway Center—the long-awaited "front door" to the Bethesda campus at Rockville Pike and South Drive near the Medical Center Metro station—opened in July, merging the now-separate pedestrian and vehicle entrances to campus into a single welcoming point.

As of October 1, NIH no longer permitted the use of any tobacco products on the Bethesda campus. The tobacco-free policy replaces smoking regulations that were instituted at NIH in 2002, which restricted smoking to selected outdoor locations. It has long been known that tobacco use has a wide range of negative health consequences.

The Edwin Smith Papyrus, one of the world's earliest known medical documents, has been digitally transformed by NLM into a document that can be perused on a computer screen. The papyrus was written in Egyptian hieratic script around the 17th century BCE, but probably based on material from 1,000 years earlier. The papyrus is a textbook on trauma surgery and discusses anatomical observations and the examination, diagnosis, treatment, and prognosis of numerous injuries in exquisite detail.

Researchers devised a fast new technique for producing human monoclonal antibodies (mAbs) that can roam the bloodstream to target and destroy infectious microbes. Using the new method, NIH-funded scientists created fully human influenza-fighting antibodies in a matter of weeks, rather than the months typically needed to generate mAbs.

The first-ever NIH health disparities summit was held December 16-18, gathering together biomedical scientists and research administrators, public health commissioners, community health care providers, and diplomats from around the world. "NIH Summit: The Science of Eliminating Health Disparities" was coordinated by NIH's National Center on Minority Health and Health Disparities.

A study by NIH-funded scientists identified over 300 human genes that play a role in West Nile virus infection. The findings reveal several potential targets for antiviral therapies.

2009

The American Recovery and Reinvestment Act (ARRA), signed by President Barak Obama on February 17, gave NIH a one-time 34% budget increase of $10.4 billion, a sum meant both to stimulate scientific research and to create jobs. The allotment, part of a $787 billion stimulus bill, must be disbursed withing 2 years, sending NIH's grant-making apparatus into high gear. At NIH, 4 big renovation projects—for the John Edward Porter Neuroscience Research Center, the NIH Clinical Center, Building 3, and NIAID's Rocky Mountain Laboratories Building 7 in Hamilton, Montana—will receive a total of nearly $430 million in building and facilities funds from ARRA.

Three international research teams have detected many tiny and common gene variations that together could account for at least one-third of the genetic risk for schizophrenia. Although none of these variants alone significantly boosts the chances of developing schizophrenia, in combination they seem to exert a powerful effect on disease risk.

NIH released the 565-page *Biennial Report of the Director, National Institutes of Health, Fiscal Years 2006 & 2007*. Mandated in January 2007 by Congress as part of Public Law 109-482, the document shows how NIH's 27 institutes and centers, along with various other NIH components, work together on the nation's largest medical research enterprise.

Rhinoviruses are a major cause of the common cold and may contribute to about half of asthma flare-ups. Researchers have now completed sequencing the genomes of all the known rhinovirus types, setting the stage for the development of medications and vaccines to combat the viruses.

NIH released its final "Guidelines for Human Stem Cell Research" on July 6, after officials spent several weeks reviewing more than 49,000 public comments on the draft guidelines. Comments were received from the scientific community, patient advocacy groups, and medical and religious organizations, as well as from private citizens and many members of Congress.

Although the prostate-specific antigen (PSA) test can spot prostate cancer early, annual tests might not lead to fewer prostate cancer deaths, according to a new report. Of over 76,000 men in an NIH-funded study, half were randomly assigned to annual screening with PSA tests for 6 rounds and digital rectal exams (DRE) for 4 rounds. The other men were assigned to usual care. After up to 10 years of follow-up, the death rate from prostate cancer didn't differ significantly between the 2 groups. Follow-up of participants will continue for several more years.

On July 9, NIH hosted the White House's H1N1 Influenza Preparedness Summit, which assembled about 500 emergency managers, educators, school nurses, and public health officials from around the country to discuss how to investigate, monitor, and slow the spread of the 2009 H1N1 influenza outbreak. NIH launched the first clinical trials of 2009 H1N1 vaccine candidates on July 22.

Regular exercise—with medical supervision—is safe for heart failure patients, improves their quality of life, and may slightly lower their risk of death or hospitalization, according to an NIH-funded study of more than 2,300 patients with heart failure.

On August 17, Dr. Francis Collins was officially sworn in as the 16th director of the National Institutes of Health.

President Barack Obama visited NIH on Sept. 30, 2009, touring a Clinical Research Center laboratory and getting updates on scientific research before delivering a 15-minute speech. He congratulated NIH for distributing the first $5 billion of a $10.4 billion ARRA appropriation by the end of fiscal year 2009.

Dr. Francis Collins said NIH should capitalize on the current supportive environment for global health science. He talked to members of a newly created trans-NIH global health research working group. The high-level group is the result of a 2-year effort by institute and center directors to analyze global health research activities at NIH and explore better ways to coordinate activities, both across NIH and throughout government. The Obama administration has pledged $63 billion to its Global Health Initiative and is seeking input on its approach.

NIH participated in a weeklong series of events comprising the first “Engaging the Public in Research Week,” held October 26-30 on campus. Although NIH has long supported community-based research—2 of the most prominent investigations being the Framingham Heart Study and the Nurses Health Study—renewed efforts seek to merge the research interests of investigators with the health issues that affect communities. The ultimate goal is to improve the health of everyone—both nationwide and abroad.

NICHD began a research program to enhance newborn screening, which can identify serious, often fatal, disorders at birth so that treatment can begin. As directed by Congress, the program was named in honor of National Football League Hall-of-Fame quarterback Jim Kelly. The Hunter Kelly Newborn Screening Research program seeks to support research to increase the number of conditions that can be diagnosed at birth, to understand the long-term effects of living with these conditions, and to foster development of new treatments.

2010

The catastrophic earthquake that struck Haiti's capital city on January 12 dealt a serious blow to NIH research interests there. GHESKIO (a French acronym for the Haitian Group for the Study of Kaposi's Sarcoma and Opportunistic Infections) was established in 1982 as the first institution in the world exclusively dedicated to fighting HIV/AIDS. GHESKIO founder and director Dr. Jean Pape is a longtime NIH grantee. NIH has 27 research projects in Haiti, primarily focused on HIV/AIDS and related conditions.

On February 24, NIH and FDA announced a new partnership—a Joint NIH-FDA Leadership Council—to help ensure that regulatory considerations form an integral part of biomedical research planning and that the latest science is integrated into the regulatory review process. In addition, NIH and FDA will jointly issue a Request for Applications, making $6.75 million available over 3 years for work in regulatory science.

By evaluating the entire genome of a 40-year-old man, scientists pinpointed gene variants linked to cardiovascular disease and several other conditions in the man's

family, as well as diseases not known to be in his family. Some variants predicted the man's likely responses to common medications, including certain heart medications. This NIH-funded study provides a glimpse into how whole-genome sequencing might one day be used in the clinic.

An independent panel convened by the NIH Office of Medical Applications of Research determined there is currently no conclusive evidence that taking any substance or engaging in any activity can prevent or delay Alzheimer's disease or cognitive decline. The state-of-the-science group announced its findings on April 28, after hearing 2 full days of medical experts discuss both disorders.

A pill that's currently used to treat HIV infection can also greatly reduce the risk of acquiring HIV among at-risk men. An NIH-funded study of nearly 2,500 men who have sex with men showed that a daily antiretroviral pill led to a 44% decline in the risk of HIV infection compared to men receiving placebo pills. The finding represents a major advance toward HIV prevention.

NLM released the first version of ReUnite, an iPhone app in the Apple iTunes App Store. The software was downloaded by more than 1,000 users in the first week of its release. ReUnite improves on the capabilities of the iPhone app Found in Haiti that was developed in response to the January earthquake. Both apps have been developed as part of ongoing research in NLM's Lost Person Finder project, which seeks to improve post-disaster family reunification technologies.

NIH-supported scientists developed a technique to regenerate damaged leg joints in rabbits. The researchers created porous scaffolds in the shape of leg bone tips and added a gel to aid cartilage development. By 3 to 4 weeks after surgery, the rabbits could move around almost as well as normal rabbits. Within 4 months, both bone and cartilage had regenerated. The accomplishment could point the way toward joint renewal in humans.

NIH will establish an induced Pluripotent Stem (iPS) Cell Center, capitalizing on the unique resources of the agency's Intramural Research Program. The new NIH iPS Cell Center is 1 of 7 new initiatives supported through the NIH Common Fund during FY 2010.

A computer model of heart disease in U.S. adults suggested that reducing salt intake by 3 grams per day could cut the number of new cases of coronary heart disease each year by as many as 120,000, stroke by 66,000 and heart attack by nearly 100,000. It could also prevent up to 92,000 deaths and save up to $24 billion in health care costs a year, the NIH-funded researchers estimated.

NIH launched a multi-year study to look at potential health effects from the oil spill in the Gulf region. The Gulf Worker Study is a response to the largest oil spill in U.S. history. NIH Director Dr. Francis Collins pledged $10 million in NIH funding for the study's initial phases and asked NIEHS to lead the research project. Oil company BP will contribute an additional $10 million to NIH for this and other health research. NIH will have full autonomy regarding the distribution of the $10 million, with input from external scientific experts in environmental health who are familiar with the Gulf region.

Nearly 40% of the energy consumed by 2- to 18-year-olds comes in the form of "empty" calories, according to a study by NIH scientists. Half of those empty calories come from the solid fats and added sugars in just 6 sources: soda, fruit drinks, dairy desserts, grain desserts, pizza and whole milk. Experts recommend that kids limit their intake of empty calories to 20% or less of their total calories.

NINDS partnered with the University of Virginia to establish a neurosurgical residency program. The 7-year program, which will enroll the first resident in July 2010, is intended to serve as a model for training neurosurgeon clinician-investigators who are capable of performing translational research.

The Patient Protection and Affordable Care Act (P.L. 111-148), also known as the health care reform law signed by President Obama, re-designated the National Center on Minority Health and Health Disparities to an institute. The official re-designation was announced in the Federal Register on September 13. The law authorizes the new institute to plan, coordinate, review, and evaluate all minority health and health disparities research activities conducted and supported by the institutes and centers.

NCI broke ground on September 22 for a new, expanded administrative and program campus to be open by 2013 in the Shady Grove section of Rockville, Maryland. The new campus will accommodate about 2,100 NCI staff now occupying rental facilities.

2011

The NIH Clinical Center received the 2011 Lasker-Bloomberg Public Service Award from the Albert and Mary Lasker Foundation. The award recognized the Center's global reach (149 countries represented), breadth of illnesses under study (575 unique conditions), and record of achievement since it opened almost 60 years ago. As the world's largest clinical research hospital, the NIH Clinical Center has ministered to nearly 450,000 patients since opening.

Treating HIV-positive patients with anti-retroviral therapy early—before their T-cell counts start to drop—can significantly lower the risk of transmitting HIV. In a large NIH-funded clinical trial, researchers selected over 1,700 couples from around the world in which one partner was HIV-positive. Half the HIV-positive patients started anti-retroviral therapy immediately, while the other half received standard clinical treatment. Early therapy reduced the rate of HIV transmission by 96%.

The new NIH Director's Early Independence Awards announced the first 10 grant recipients. The program is designed to accelerate the entry of outstanding junior investigators into independent researcher positions immediately after completing their graduate research degree or clinical residency. The awards were created as part of an NIH-wide effort to empower the biomedical research workforce, particularly through the support of investigators early in their careers.

Avian flu-fighting antibodies rose significantly in adults who received a DNA "primer" vaccine followed by an avian flu shot. In an NIH study, people given the primer, followed 6 months later with an inactivated H5N1 vaccine, had 4 times the amount of antibody of those who received 2 vaccine doses. The technique holds promise for blocking several strains of influenza.

A March 31 symposium marked the launch of the new NIH-Lasker Clinical Research Scholars Program, designed to recreate NIH's heyday of clinical research. NIH-Lasker clinical scholars will spend the first 5 to 7 years as independent investigators in the NIH Intramural Research Program. In the second phase, an additional 5 years of funding will be offered to scholars who successfully complete the first phase.

In a novel approach, researchers used computers and genomic data to find new applications for existing FDA-approved drugs. Computer algorithms correctly paired diseases with their current treatments and also found new disease-drug pairs. Two of these drugs were tested in rodent models and effectively treated the paired disease. This new method represents a major step forward in drug discovery.

On September 16, President Obama announced that NIH will collaborate with the FDA and the Defense Advanced Research Projects Agency to develop a chip to screen for safe and effective drugs far more swiftly and efficiently than current methods, and before they are tested in humans. The effort will bring together the latest advances in engineering, biology, and toxicology to bear on complex problem of drug toxicity.

After its first 2 years of operation, NIH's Undiagnosed Diseases Program published a retrospective analysis of its initial successes in patients whose cases have stumped specialists at leading medical institutions around the country. The report focuses on 160 patients of the total 326 cases accepted into the program. In February, the program also announced its first discovery of a new disease, called ACDC, or arterial calcification due to deficiency of CD73.

A study in the *New England Journal of Medicine* reports that more than 150 new FDA-approved drugs, vaccines, and new indications for existing drugs were discovered through research carried out in Federal laboratories, primarily NIH, and other public sector institutions principally funded by NIH over the last 3 decades. Of these 153 new products, 22 arose from inventions made in the NIH Intramural Research Program, the largest single source of the inventive technologies.

NIH launched the new Medical Research Scholars Program to provide mentored training to creative, research-oriented medical, dental, and veterinary students at the NIH campus. This year-long program blends the elements of 2 former, highly successful programs—the NIH Clinical Research Training Program and the Howard Hughes Medical Institute-NIH Research Scholars Program. It is co-sponsored by NIH and other partners via contributions to the Foundation for the NIH.

NIH awarded $143.8 million to challenge the status quo with innovative ideas that have the potential to propel fields forward and speed the translation of research into improved health. The awards are granted under 3 research programs supported by the NIH Common Fund: the NIH Director's Pioneer, New Innovator, and Transformative Research Projects Awards. The Common Fund, enacted into law by Congress through the 2006 NIH Reform Act, supports trans-NIH programs that emphasize innovation and risk taking.

Establishment of NIH's National Center for Advancing Translational Sciences (NCATS) marks the start of a new era for NIH and translational science. Congress approved NCATS with the FY 2012 spending bill, and the President signed it into law on December 23. NCATS's mission is to develop innovative methods and technologies designed to reduce, remove or bypass bottlenecks in delivering new drugs, diagnostics, and medical devices to patients with a wide range of diseases and conditions.

2012

In February, the Obama administration announced new efforts to fight Alzheimer’s disease, including immediately making an additional $50 million available for cutting-edge Alzheimer’s research. Investments for FY 2012 and 2013 total $130 million in new Alzheimer’s research funding over 2 years—over 25% more than the current annual Alzheimer’s research investment. The additional NIH research funding will support both basic and clinical research.

A landmark NIH-funded study showed that nerve fibers in the brain aren't just a tangle of overlapping wires. Rather, they form a highly structured 3-D grid, with nerve pathways running parallel to each other and crossing each other at right angles. The finding is part of a larger effort called the Human Connectome Project, which is mapping connections between the brain’s 100 billion neurons.

A new online tool called the Genetic Testing Registry (GTR) will make it easier to navigate the rapidly changing landscape of genetic tests. Genetic tests currently exist for about 2,500 diseases, and the field is expanding rapidly. Frequent updates to GTR will include information on the purpose and limitations of each genetic test; whether it's a clinical or research test; and what is measured. GTR will contain no confidential information about people who receive genetic tests.

To spotlight the science of obesity and NIH’s efforts to combat the obesity epidemic, NIH collaborated with HBO and major research and health organizations to develop “The Weight of the Nation,” a documentary series and public education initiative that highlights this urgent public health problem. Segments of the series were screened at events around the country.

NIH-funded research allowed paralyzed patients to reach and grasp objects by controlling a robotic arm with their thoughts. Scientists taught 2 patients who were paralyzed by stroke—a 58-year-old woman and a 66-year-old man—to mentally control a robotic limb. The advance may help restore some independence and improve quality of life for people who've lost use of their limbs.

Nearly 2 years after the Deepwater Horizon oil spill in the Gulf of Mexico, more than 10,000 cleanup workers and volunteers have enrolled in the Gulf Long-term Follow-up (GuLF) study. The study is a national effort by NIEHS to determine if the oil spill led to physical or mental health problems. Recruitment continues, with the goal of reaching 55,000 participants, which would make it the largest health study of its kind.

A worldwide research consortium uncovered the treasure in “junk” DNA, creating a view of the human genome that extends well beyond our genes. The NIH-funded ENCODE project involved over 1,600 sets of experiments on 147 types of tissue. Scientists catalogued many aspects of gene regulation that can affect function. The project's ultimate goal is to identify all functional elements in the human genome, including genes and the DNA in between.

On September 8, NIH hosted a “Celebration of Science,” organized in Washington, D.C., by the Milken Institute and FasterCures. The audience included NIH stakeholders from academia, industry and patient advocacy groups from across the U.S.

Experts recommend that older women have regular bone density tests to screen for osteoporosis. But it had been unclear how often to repeat the tests. An NIH-supported study of nearly 5,000 women reported that patients with healthy bone density on their first test might safely wait 15 years before getting rescreened. These findings can help guide doctors in their bone screening recommendations.

Researchers supported primarily by NIH found that programs to prevent or delay type 2 diabetes make sound economic sense. Despite the money spent on these

interventions, they lower overall medical care costs and improve quality of life. Diabetes currently costs the nation an estimated $174 billion per year, including $116 billion in medical expenses and $58 billion in indirect costs like disability and work loss.

The 26th annual NIH Research Festival, held October 9-12, had the theme: “NIH at 125: Today's Discoveries, Tomorrow's Cures.” As the showcase for NIH’s Intramural Research Program, the festival brings people together, invites speakers and students, and celebrates the research conducted by nearly 6,000 scientists working in NIH’s own laboratories.

The FDA approved a new type of rheumatoid arthritis medication that can trace its origins back to basic research at NIH. The drug (tofacitinib) targets Janus kinases, a family of proteins that includes the JAK3 enzyme discovered by NIAMS scientists in the early 1990s. Collaborations with NHLBI later linked JAK3 defects to severe combined immunodeficiency, leading to the idea that drugs blocking Janus kinases might protect against certain autoimmune diseases, including rheumatoid arthritis.

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National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

The NIH Directors

NIH DIRECTOR FRANCIS S. COLLINS, M.D., PH.D.

Francis S. Collins, M.D., Ph.D., a physician-geneticist noted for his landmark discoveries of disease genes and his leadership of the Human Genome Project, served as Director of the National Human Genome Research Institute (NHGRI) at the National Institutes of Health from 1993-2008. Read Dr. Collins' full biosketch

CHRONOLOGY OF NIH DIRECTORS

Name	In Office from	To
Joseph J. Kinyoun[1]	August 1887	April 30, 1899
Milton J. Rosenau	May 1, 1899	September 30, 1909
John F. Anderson	October 1, 1909	November 19, 1915
George W. McCoy[2]	November 20, 1915 May 26, 1930	May 25, 1930 Jan. 31, 1937
Lewis R. Thompson	February 1, 1937	January 31, 1942
Rolla E. Dyer[3]	February 1, 1942 June 16, 1948	June 15, 1948 September 30, 1950
William H. Sebrell, Jr.	October 1, 1950	July 31, 1955
James A. Shannon	August 1, 1955	August 31, 1968
Robert Q. Marston	September 1, 1968	January 21, 1973
Robert S. Stone	May 29, 1973	January 31, 1975
Donald S. Fredrickson	July 1, 1975	June 30, 1981
James B. Wyngaarden	April 29, 1982	July 31, 1989
Bernadine Healy	April 9, 1991	June 30, 1993
Harold E. Varmus	November 23, 1993	December 31, 1999
Elias A. Zerhouni	May 2, 2002	October 31, 2008
Francis S. Collins	August 17, 2009	Present

[1] Director, Hygienic Laboratory.
[2] Director, National Institute of Health.
[3] Director, National Institutes of Health.

BIOGRAPHICAL SKETCHES

Joseph James Kinyoun, M.D.

Founder and director of the Hygienic Laboratory, Dr. Joseph J. Kinyoun introduced scientific research into the Marine Hospital Service. His

interest in bacteriology and his isolation of the cholera organism laid the groundwork for the present health research program of NIH.

Dr. Kinyoun received his M.D. degree from New York University in 1882 and did postgraduate work in Europe under the German bacteriologist, Robert Koch.

Dr. Kinyoun joined the Marine Hospital Service in 1886. In a one-room laboratory on Staten Island, N.Y., he applied new techniques he had learned in Europe, enabling him to isolate the organism that causes cholera. The Hygienic Laboratory was established in August 1887 and Dr. Kinyoun served as its director until April 30, 1899.

During his government career, Dr. Kinyoun designed the Kinyoun-Francis sterilizer, a shipboard disinfecting apparatus. In 1903 he retired from public service and, after working in private industry and as a professor at the George Washington University, he became a bacteriologist in the District of Columbia Health Department.

Milton Joseph Rosenau, M.D.

As second director of the Hygienic Laboratory, Dr. Milton J. Rosenau was responsible for expanding its scope of investigations.

After receiving his M.D. from the University of Pennsylvania, he did postgraduate work in Europe in the field of sanitation and public health.

In 1890 he received his commission in the Marine Hospital Service. He became director of the Hygienic Laboratory on May 1, 1899.

A pioneer in the study of anaphylaxis, he also conducted research on yellow fever, malaria, typhoid fever, poliomyelitis, disinfectants, and the pasteurization of milk. His *Preventive Medicine and Hygiene* is a standard text for students of public health.

On September 30, 1909, Dr. Rosenau resigned from government service to join the staff of Harvard Medical School. In 1936 he went to the University of North Carolina where he served as director of the Public Health School.

John F. Anderson, M.D.

Dr. John F. Anderson, third director of the Hygienic Laboratory, was among the early scientists who made the Laboratory well-known in scientific circles.

After receiving his M.D. degree at the University of Virginia, he went abroad to study bacteriology. Upon returning in 1898, he joined the Marine Hospital Service and on October 1, 1909, succeeded Dr. Rosenau as director of the Hygienic Laboratory.

Throughout his career in the service, he was actively engaged in research. He studied serum and vaccine therapy, immunology, cholera, typhus, poliomyelitis, and public health and sanitation problems. He worked with Dr. Rosenau on hyper- susceptibility, anaphylaxis, and tuberculosis, and with Dr. Joseph Goldberger on the transmission of measles to monkeys, providing science with an experimental animal for that disease.

Dr. Anderson served as director of the Hygienic Laboratory until November 19, 1915, when he resigned to become director of the Research and Biological Laboratories and later vice president of E. R. Squibb & Sons.

George Walter McCoy, M.D.

Dr. George W. McCoy was, during his lifetime, the Nation's greatest authority on leprosy. For his many contributions to public health, he won the Sedgwick Memorial Medal of the American Public Health Association in 1921.

He entered the Marine Hospital Service in 1900 after graduating from the University of Pennsylvania Medical School.

During his first assignment at the Marine hospital in San Francisco, he became interested in leprosy. While heading the U.S. Plague Laboratory in San Francisco from 1908 to 1911, he discovered that the California ground squirrel was responsible for the spread of the organism causing tularemia.

On November 20, 1915, he became fourth director of the Hygienic Laboratory, renamed "National Institute of Health" in 1930. During this period he conducted important studies in influenza, poliomyelitis, smallpox, tularemia, amoebic dysentery, and pneumonia. Dr. McCoy served as director until January 31, 1937.

After conducting a nationwide survey on leprosy, Dr. McCoy retired from PHS on June 30, 1938, and joined the staff of Louisiana State University in New Orleans.

Lewis Ryers Thompson, M.D.

Dr. Lewis R. Thompson was intensely interested in research on industrial health problems and on problems of stream pollution.

He joined PHS in 1910, having graduated from Louisville Medical College. After becoming chief of the Division of Scientific Research in 1930, he administered field investigations of stream pollution, malaria, cancer, nutritional diseases, child hygiene, milk, dental problems, and industrial hygiene. When the division was merged with NIH, Dr. Thompson became director on February 1, 1937.

Dr. Thompson was largely responsible for securing the present-day site of NIH and for securing appropriations for the construction of the first

six buildings. He served as director until January 31, 1942, and after retiring from PHS in 1947 became a scientific director of the international health division of the Rockefeller Foundation.

Rolla Eugene Dyer, M.D.

Dr. Rolla E. Dyer's major research contributions were in the field of infectious diseases; in particular, endemic typhus. He demonstrated how endemic typhus is spread and helped develop a vaccine to protect against the disease.

Dr. Dyer received his M.D. from the University of Texas and joined PHS in 1916.

His first assignment involved fieldwork on bubonic plague in New Orleans. Five years later he joined the staff of the Hygienic Laboratory, became chief of the Division of Infectious Diseases in 1936, and director of NIH in 1942.

As director, Dr. Dyer organized the Division of Research Grants, assisted in planning the Clinical Center, and helped establish three new institutes: the National Heart Institute, the National Institute of Dental Research, and the National Institute of Mental Health.

After retiring from active duty on September 30, 1950, Dr. Dyer served as a member of the scientific board of directors of the international health division of the Rockefeller Foundation.

William Henry Sebrell, Jr., M.D.

A leading international authority on nutrition, Dr. William H. Sebrell first recognized and described the dietary deficiency disease, ariboflavinosis, and made significant contributions to knowledge of dietary needs and deficiencies.

Dr. Sebrell received his M.D. degree from the University of Virginia and joined PHS in 1926.

He began his research career under Dr. Joseph Goldberger who demonstrated that pellagra is a deficiency disease. During the 1930's, Dr. Sebrell made many important contributions to our knowledge of the anemias and the role of diet in cirrhosis of the liver.

During World War II, Dr. Sebrell was codirector of the National Nutrition Program which coordinated activities of all state agencies working in the field of nutrition. This program aided food production and the maintenance of civilian health during the war years.

In 1948 he became director of the Experimental Biology and Medicine Institute, and on October 1, 1950, was appointed director of NIH. He held this post until his retirement on July 31, 1955.

Dr. Sebrell helped formulate the first international standards of nutrition for the League of Nations, and pioneered the growing acceptance of scientific nutrition as a regular function of modern state and local health departments.

James A. Shannon, M.D.

Dr. James A. Shannon, widely recognized in the scientific world for his original research in kidney function, chemotherapy, and malaria, has throughout his career, been devoted to medical research, teaching, and public service.

He received his M.D. in 1929 and a Ph.D. in physiology in 1935 from New York University.

Following his internship at Bellevue Hospital in New York, Dr. Shannon taught in the department of physiology at New York University College of Medicine from 1931 to 1941, and directed research at the university's Goldwater Memorial Hospital from 1940 to 1945.

During periods of leave, he served as guest investigator at the physiological laboratory, University of Cambridge, England, and as a member of the staff of the Marine Biological Laboratory at Woods Hole, Mass.

During World War II, Dr. Shannon played a prominent part in malaria research activities of the National Research Council and was consultant on tropical diseases to the secretary of war. In recognition of this work, he received the Presidential Medal for Merit, the highest award at that time for civilian service in government.

Before joining PHS in 1949, he was director of the Squibb Institute for Medical Research (1946-49), and special consultant to the PHS Surgeon General.

Dr. Shannon then served as associate director in charge of research in the National Heart Institute until 1952. After holding the post of associate director, NIH, for 3 years, he became its director on August 1, 1955.

Among his many honors were the Public Welfare Medal of the National Academy of Sciences for "eminence in the application of science to the public welfare" (1962), the Rockefeller Public Service Award for Science, Technology, or Engineering (1964), and the Presidential Distinguished Federal Civilian Service Award (1966).

On retiring as NIH director (August 31, 1968), Dr. Shannon joined the NAS as special advisor to the president. In February 1970 he became professor and special assistant to the president, Rockefeller University. He retired from those positions in 1975.

Robert Q. Marston, M.D.

Dr. Robert Quarles Marston became director of NIH on September 1, 1968, after serving for 5 months as administrator of the Health Services

and Mental Health Administration.

He received his B.S. degree in 1943 from the Virginia Military Institute, and his M.D. from the Medical College of Virginia in 1947. As a Rhodes scholar, he worked for the next 2 years with Nobel prizewinner Howard Florey at Oxford University, Oxford, England, earning a B.Sc. from that institution in 1949.

After an internship at Johns Hopkins Hospital and a year's residency at Vanderbilt University Hospital in Nashville, Tenn., he was stationed at NIH from 1951 to 1953 as a member of the Armed Forces Special Weapons Project, conducting research on the role of infection after whole body irradiation. He completed his residency at the Medical College of Virginia in Richmond the following year.

While a Markle fellow, he served as assistant professor of medicine at the Medical College of Virginia from 1954 to 1957, and as assistant professor of bacteriology and immunology at the University of Minnesota in Minneapolis for 1 year. He returned to the Medical College of Virginia in 1959 as associate professor of medicine and assistant dean in charge of student affairs.

In 1961, Dr. Marston became director of the University of Mississippi Medical Center and dean of the School of Medicine in Jackson, Miss., and was appointed vice chancellor there in 1965.

He became an associate director of NIH and director of the newly created Division of Regional Medical Programs on February 1, 1966.

On April 1, 1968, Dr. Marston was named administrator of the Health Services and Mental Health Administration, under a departmental reorganization.

He became acting director of the National Institute of Neurological Diseases and Stroke on January 21, 1973. He left the Federal service in April 1973 to become a scholar-in-residence at the University of Virginia. He also was named the first distinguished fellow of the Institute of Medicine, NAS.

On January 11, 1974, Dr. Marston was named president of the University of Florida at Gainesville, a position he held until 1984, after which he sat on the governing board of Virginia Military Institute while continuing his work with graduate students at the University. He retired in the late 1980's.

Robert S. Stone, M.D.

Dr. Robert S. Stone, former vice president for health services and dean of the school of medicine at the University of New Mexico, became director of NIH on May 29, 1973.

He received his B.A. in 1942 from Brooklyn College and his M.D. from the State University of New York College of Medicine in 1950. Dr. Stone was an instructor in pathology at Columbia University College of Physicians and Surgeons from 1950 to 1952.

Following his 1950-1952 internship and assistant residency in pathology at New York's Presbyterian Hospital, Dr. Stone moved to Los Angeles and joined the faculty of UCLA's School of Medicine, department of pathology.

From 1957 to 1959 as part of his academic duties he was deputy coroner at Los Angeles County, and for several years was pathologist for the Los Angeles Shriners Hospital for Crippled Children.

While on sabbatical as a visiting scientist at the Rockefeller Institute in 1959, he was credited with demonstrating by electron microscopy that the Shope papilloma virus of rabbits could be found in mature skin cells, but was undetectable, although presumed present, in younger growing cells.

Based on his observation of autopsies of atomic bomb victims in Hiroshima, Japan, Dr. Stone was one of the first researchers to suggest that radiation exposure increases the incidence of certain known diseases rather than creating new types. He served as chief of research in pathology for the Atomic Bomb Casualty Commission from 1959 to 1960.

He contributed to the concept of developing a method control population to study the normal incidence of various diseases for comparison, as was subsequently done.

It was as a result of this work and his continuing interest that he was appointed to the NAS Advisory Committee on the Atomic Bomb Casualty Commission.

Dr. Stone joined the University of New Mexico School of Medicine as chairman of the department of pathology in 1963, and became dean of the school in 1968. Prior to his appointment as NIH director, he took a year's leave from the university and was a visiting professor at the Sloan School of Management, MIT.

He became dean of the School of Medicine of the University of Oregon Health Sciences Center and vice president of the Health Sciences Center in August 1975. In August of 1978, he was appointed dean of the College of Medicine at Texas A & M University in August of 1978.

Donald S. Fredrickson, M.D.

Dr. Donald S. Fredrickson, internationally known authority on lipid metabolism and its disorders, became NIH director on July 1, 1975. Immediately prior to this appointment, he had served for 1 year (1974-1975) as president of the Institute of Medicine, NAS.

His association with NIH, however, spanned more than two decades beginning in 1953 when he joined the scientific staff of the then National Heart Institute (renamed the National Heart, Lung, and Blood Institute in 1976) as a clinical associate.

During his research career in the Federal service, Dr. Fredrickson held numerous positions at NIH, several in the heart institute simultaneously.

From 1955 to 1961 he was a member of the Laboratory of Cellular Physiology and Metabolism. He then served as clinical director (1961-1966), while continuing his research as head of the section of molecular diseases, Laboratory of Metabolism (1962-1966). He was appointed institute director in 1966, serving in that capacity until 1968. He combined this executive responsibility with research as chief of the Molecular Diseases Branch (1966-1974), and as director of intramural research (1969-1974).

His earliest research interests centered on the metabolism of sterols. Later he focused on the structure of the plasma lipoproteins, their importance in the transport of fats, and the genetic factors regulating their metabolism and concentration in blood. It was during this period that he discovered two new genetic disorders: Tangier disease (absence of high density lipoproteins) and cholesteryl ester storage disease, a lysosomal enzyme deficiency.

In 1965 he and his coworkers introduced a system for identifying and classifying blood-lipid abnormalities on the basis of plasma lipoprotein patterns. From this work came recognition of new monogenic causes of hyperlipidemia: type 3 and type 5 hyperlipoproteinemia and what is called familial hypertriglyceridemia. The system received prompt acceptance by the WHO and is now used widely by laboratories around the world.

Research findings of Dr. Fredrickson and colleagues have also included the discovery of several previously unknown apolipo-proteins, and new knowledge including descriptions concerning the structure and function of various apoproteins.

He received both his B.S. (1946) and M.D. (1949) from the University of Michigan, and was certified by the American Board of Internal Medicine in 1957. He did postgraduate work at Peter Bent Brigham and Massachusetts General Hospitals and the Harvard Medical School prior to coming to NIH in 1953.

Dr. Fredrickson was a member of numerous professional societies in addition to the NAS and the American Academy of Arts and Sciences.

He resigned as NIH director on June 30, 1981 and returned to the NAS as a visiting scholar. In 1983 he joined the Howard Hughes Medical Institute (HHMI) as vice president, and became president and CEO in 1984. In 1987 he left HHMI and became a scholar at the National Library of Medicine.

James B. Wyngaarden, M.D.

Dr. James B. Wyngaarden, an internationally recognized authority on the regulation of purine biosynthesis and the genetics of gout, and a nationally respected advisor on various aspects of the administration of biomedical research, became the 12th director on April 30, 1982. Immediately prior to his appointment, he was professor and chairman of the department of medicine at Duke University School of Medicine, a position he had held since 1967.

He has had a long association with the NIH. From 1953 to 1954, he was a research associate in the Laboratory of Chemical Pharmacology of the then National Heart Institute, and from 1954 to 1956, he was a clinical associate at the then National Institute of Arthritis and Metabolic Diseases. After leaving in 1956 to become associate professor at the Duke University School of Medicine, he continued an association with NIH. He has held grants from several NIH components.

Dr. Wyngaarden has been active on various NIH study groups, evaluation committees, and review panels over the years, including a term with the board of scientific counselors of the then NIAMD (1971-1974). He also served as a consultant to the NIH as a member of study sections (1958-1960; 1967-1969).

He has also served as advisor to the broader scientific community as a member of the National Academy of Sciences since 1974, and was active from 1975 to 1982 on an NAS committee set up to study the Nation's overall need for biomedical and behavioral researchers; consultant for the President's Office of Science and Technology (1966-1972), a member of the President's Science Advisory Committee (1972-1973), and a member of the U.S. Atomic Energy Commission's Advisory Committee on Biology and Medicine.

Dr. Wyngaarden is the coauthor of *Cecil Textbook of Medicine*. In collaboration with former NIH director, Dr. Fredrickson, and others, he edited *The Metabolic Basis of Inherited Disease*. The original work was published in 1960.

He attended Calvin College there, and Western Michigan University in 1943-1944. In 1948 he graduated first in his class from the University of Michigan Medical School.

Dr. Wyngaarden trained in internal medicine at the Massachusetts General Hospital and did postdoctoral work at the Public Health Research Institute of the City of New York, under the direction of Dr. DeWitt Stetten, Jr., former NIGMS director. After serving as research associate at NIH from 1953 to 1956, he went to Duke and in 1959 became director of the medical research training program there as well as associate professor of medicine and biochemistry. In 1961 he became professor of medicine and associate professor of biochemistry.

In 1963 and 1964, he was a visiting scientist at the Institute de Biologie-Physiocochemique in Paris. Shortly after his return to this country, he left Duke to become professor and chairman of the department of medicine and professor of biochemistry at the University of Pennsylvania. He returned to Duke in 1967.

Dr. Wyngaarden has received many honorary degrees: University of Michigan (D.Sc., 1980), Medical College of Ohio (D.Sc., 1984), University of Illinois at Chicago (D.Sc., 1985), George Washington University (D.Sc., 1986), and Tel Aviv University (Ph.D., 1987).

He is a diplomate of the American Board of Internal Medicine. He has served on editorial boards of numerous professional publications.

Dr. Wyngaarden is a member of a number of professional societies including the NAS Institute of Medicine, the American Academy of Arts and Sciences, the American Society for Clinical Investigation, and is a past president of the Association of American Physicians. He is a fellow of the Royal College of Physicians of London and was elected to the Royal Academy of Sciences of Sweden in 1987.

Bernadine Healy, M.D.

Dr. Bernadine Healy became NIH director in April 1991. Shortly after her appointment, she launched the NIH Women's Health Initiative, a $500 million effort to study the causes, prevention, and cures of diseases that affect women. She also established the Shannon Award, grants designed to foster creative, innovative approaches in biomedical research and keep talented scientists in a competitive system.

Prior to her appointment, she was chairman of the Research Institute of the Cleveland Clinic Foundation, where she directed the research programs of nine departments including efforts in cardiovascular disease, neurobiology, immunology, cancer, artificial organs, and molecular biology. From her appointment in November 1985, she also served as a staff member of the clinic's department of cardiology.

In February 1984, Dr. Healy became deputy director of the Office of Science and Technology Policy at the White House. Her appointment, made by President Reagan and confirmed by the Senate in June of 1984, involved her heavily in life science and regulatory issues at the Federal level. She served as chairman of the White House Cabinet Working Group on Biotechnology, was executive secretary of the White House Science Council's Panel on the Health of Universities, and served as member of several advisory groups, including the councils of the NHLBI, NCI, as well as the White House Working Group on Health Policy and Economics. From June 1976 until February 1984, she was professor of medicine at Johns Hopkins University School of Medicine and Hospital, where she also had clinical responsibilities, directed a program in cardiovascular research, and was director of the coronary care unit. In addition to serving on the medical school faculty, she assumed the role of assistant dean for postdoctoral programs and faculty development.

Among her other professional affiliations, Dr. Healy has served on the board of governors of the American College of Cardiology and has been president of the American Federation of Clinical Research (1983-84) and was chairman of its public policy committee for several years. She was president of the American Heart Association in 1988-1989 and has served as a member of its board of directors since 1983. As AHA president, she initiated a women's minority leadership task force and a women and heart disease program that took hold in affiliates nationwide.

She is a member of the Institute of Medicine of NAS. In 1989 she was elected as a member of the board of overseers of Harvard College and has served on the board of trustees of Vassar College. She has also been chairman of the Ohio Council on Research and Economic Development, and served on several other advisory committees and boards, including the Ohio Board of Regents.

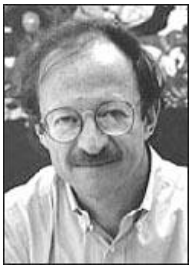
Dr. Healy has been active in several Federal advisory groups. Until her NIH appointment, she was a member of the advisory committee to the NIH director. She has been a member of the White House Science Council and chairman of the advisory panel for new developments in biotechnology of the Office of Technology Assessment of the U.S. Congress and a member of the NASA Life Sciences Strategic Planning Study Committee. In 1990 she was appointed to the President's Council of Advisers on Science and Technology (PCAST) and served as its vice chairman. She also chaired the advisory panel for basic research for the 1990s of the Office of Technology Assessment, and served on the special medical advisory committee of the Department of Veterans Affairs.

She received her bachelor's degree from Vassar College in 1965, and her M.D., cum laude, from Harvard Medical School in June 1970. She completed training in internal medicine and cardiology at Johns Hopkins School of Medicine.

Dr. Healy has written extensively in the areas of cardiovascular research and medicine, and has served on the editorial boards of numerous scientific journals.

She stepped down as director of NIH on June 30, 1993, to return to the Cleveland Clinic in Ohio. Dr. Healy was dean of the Ohio State University Medical School and President and Chief Executive Officer of the American Red Cross.

Harold E. Varmus, M.D.



Dr. Harold E. Varmus became 14th director of NIH on November 23, 1993. Winner of the Nobel Prize in 1989 for his work in cancer research, he came to NIH from the University of California, San Francisco. He is a leader in the study of cancer-causing genes called "oncogenes," and an internationally recognized authority on retroviruses, the viruses that cause AIDS and many cancers in animals.

Prior to his appointment, he was professor of microbiology, biochemistry, and biophysics, and the American Cancer Society professor of molecular virology at UCSF. He has been working at the cutting edge of modern cell and molecular biology, and has had an active relationship with NIH for about 30 years as an intramural scientist, grantee, and public advisor.

Dr. Varmus and his UCSF colleague Dr. J. Michael Bishop shared the 1989 Nobel in Physiology or Medicine for demonstrating that cancer genes (oncogenes) can arise from normal cellular genes, called proto-oncogenes. While investigating a retroviral gene, v-src, responsible for causing tumors in chickens, they discovered a nonviral src gene, very similar to v-src, present in the normal cells of birds and mammals.

In recent years his work has assumed special relevance to AIDS, through a focus on biochemical properties of HIV, and to breast cancer, through investigation of mammary tumors in mice. His research activities included grants from NCI, NIAID, NIGMS, American Cancer Society, and the Melanie Bronfman Award for Breast Cancer.

Dr. Varmus has served as chairman of the board of biology for the National Research Council, an advisor to the Congressional Caucus for Biomedical Research, a member of the joint steering committee for Public Policy of Biomedical Societies, and cochairman of the New Delegation for Biomedical Research, a coalition of leaders in the biomedical community. He directed "Winding Your Way Through DNA," a popular public symposium on recombinant DNA staged by UCSF.

Author or editor of four books and nearly 300 scientific papers, he has been elected to the Institute of Medicine, the National Academy of Sciences, and the American Academy of Arts and Sciences. His most recent book, *Genes and the Biology of Cancer*, intended for a general audience, was coauthored with Robert Weinberg for the Scientific American Library. He as edited several professional journals, and served on a variety of review and advisory boards for government, biotechnology firms, and pharmaceutical companies.

Dr. Varmus was a member of the IOM committee that advised the Department of Defense on the use of $210 million allocated by Congress in 1992 for breast cancer

research. In 1986 he chaired the subcommittee of the International Committee on the Taxonomy of Viruses that gave the AIDS virus its name, HIV.

He attended public schools in Freeport, Long Island; his father practiced family medicine and his mother was a psychiatric social worker. He is a graduate of Amherst College (B.A., 1961), where he majored in English literature and edited the school newspaper; Harvard University (M.A., 1962); and Columbia University (M.D., 1966). While in medical school, he worked for 3 months at a mission hospital in northern India.

After an internship and residency in internal medicine at Columbia-Presbyterian Hospital in New York, he served as a clinical associate for 2 years (1968-70) at the National Institute of Arthritis and Metabolic Diseases, where he did his first scientific work in the area of bacterial genetics with Dr. Ira Pastan, who is now chief of NCI's Laboratory of Molecular Biology. He came to UCSF as a postdoctoral fellow in Bishop's laboratory in 1970, initiating a long-standing collaboration to study tumor viruses, and was appointed to the faculty later that year.

He became a full professor in 1979 and an ACS research professor in 1984. Dr. Varmus left NIH in December 1999 to become the President and Chief Executive Officer of the Memorial Sloan-Kettering Cancer Center.

Elias A. Zerhouni, M.D.

Former NIH Director, Elias A. Zerhouni, M.D., lead the nation's medical research agency and oversaw the NIH's 27 Institutes and Centers with more than 18,000 employees and a fiscal year 2008 budget of $29.5 billion.

The NIH investigates the causes, treatments, and preventive strategies for both common and rare diseases, helping to lead the way toward important medical discoveries that improve people's health and save lives. More than 83% of the NIH's funding is awarded through almost 50,000 competitive grants and awards to more than 325,000 scientists and research support staff at more than 3,000 universities, medical schools, and other research institutions in every state and around the world. About 10% of the NIH's budget supports projects conducted by nearly 6,000 scientists in its own laboratories, most of which are on the NIH campus in Bethesda, Maryland.

Dr. Zerhouni, a world renowned leader in the field of radiology and medicine, has spent his career providing clinical, scientific, and administrative leadership. He is credited with developing imaging methods used for diagnosing cancer and cardiovascular disease. As one of the world's premier experts in magnetic resonance imaging (MRI), he has extended the role of MRI from taking snapshots of gross anatomy to visualizing how the body works at the molecular level. He pioneered magnetic tagging, a non-invasive method of using MRI to track the motions of a heart in three dimensions. He is also renowned for refining an imaging technique called computed tomographic (CT) densitometry that helps discriminate between non-cancerous and cancerous nodules in the lung.

Milestones

Since being named by President George W. Bush to serve as the 15th Director of the National Institutes of Health in May 2002, Dr. Zerhouni has overseen a number of milestones:

Reauthorization demonstrated renewed confidence in NIH
Congress passed and President Bush signed into law the National Institutes of Health Reform Act of 2006. The agency's third reauthorization in history and first since 1993, it signaled renewed confidence in the NIH mission, its employees and its leadership. The new law provides the NIH director expanded authority to manage the agency, encourages NIH Institutes and Centers (ICs) to collaborate on trans-NIH research and reforms the agency's reporting system. Reauthorization will strengthen the links within NIH and between the intramural and extramural research communities. Ultimately, it will help NIH more effectively balance what has traditionally worked in science — freedom of exploration, autonomy, decentralization — with providing opportunities for people to collaborate and cooperate more freely.

Development of a new office to improve trans-NIH initiatives
In 2005, NIH launched the Office of Portfolio Analysis and Strategic Initiatives (OPASI) in the Office of the NIH Director to transform the way NIH finds and funds cutting-edge research, improve our ability to identify public health challenges, and increase trans-NIH dialogue, decision-making and priority-setting. OPASI will build upon the model of the NIH Roadmap for Medical Research and will coordinate with NIH ICs and external stakeholders to identify research priorities that will ultimately improve NIH's ability to be nimble, dynamic, and responsive to emerging scientific opportunities and public health needs.

Although OPASI will not have grant-making authority, it will provide an "incubator space" to jump-start trans-NIH initiatives and support ICs that will take the lead on priority projects on a time-limited basis (5 to 10 years). These OPASI initiatives will be supported by the "Common Fund for Shared Needs," a central funding source built upon the Roadmap budget model. Building from current Roadmap funds, which amount to about 1.6 percent of NIH's total budget in fiscal year 2007, the Fund will increase to up to 5 percent of the total NIH budget depending on NIH budget growth, scientific opportunities and public health needs.

Initiated the NIH Roadmap for Medical Research
Launched in September 2003, the NIH Roadmap for Medical Research, a new research vision to accelerate medical discovery to improve health, focuses the attention of the biomedical research community on new pathways of discovery, research teams for the future and the re-engineering of the clinical research enterprise. It aims to accelerate the pace of discovery and speed the application of new knowledge to the development of new prevention strategies, new diagnostics and new treatments, and, ultimately, to the transfer these innovations to health care providers, and the public.

Established an NIH-wide research initiative to address the obesity epidemic
The Strategic Plan for NIH Obesity Research is a multi-dimensional research agenda that addresses one of the nation's most dramatic health challenges. In the U.S. population, recent figures show that 65 percent of adults—or 130 million people are overweight or obese. The strategic plan enhances both the development of new research in areas of greatest scientific opportunity and the coordination of obesity research across the NIH. The plan calls for interdisciplinary research teams to bridge the study of behavioral and environmental causes of obesity with the study of genetic and biologic causes.

Supported the NIH Neuroscience Blueprint

Mental illness, neurological disorders and a range of behavioral disorders are major causes of human suffering and contribute greatly to the burden of disease. These illnesses exact a cost of $500 billion each year. NIH Directors from 17 Institutes and Centers have developed a model of strategic leadership to address several of the most common causes of death and disability, as well as rare disorders that affect the brain, spinal cord, or nerve cells throughout the body. The blueprint leverages the abilities of the Institutes and Centers to create new resources, tackle common scientific problems, and train the next generation of neuroscientists through collaboration and leadership.

Made health disparities a research priority

"Broadening the collaborative relationships developed through partnerships between NIH and institutions and researchers from all populations," is the focus of Dr. Zerhouni's commitment to eliminating health disparities and disparities in the burden of disease. In 2007, NIH announced the awarding of $66.7 million to support the advancement of health disparities research. This was the most recent in a series of commitments of funds to this research. NIH has made 58 awards under the Centers of Excellence program. NIH as a whole expects to spend $2.8 billion on research funding for health disparities.

Ensured public access to NIH-funded research results

February 3, 2005, Dr. Zerhouni announced an historic public access policy. For the first time, the public will have access to peer-reviewed research publications that resulted from studies funded by NIH. Dr. Zerhouni has urged maximum participation by investigators, encouraging scientists to submit their publications as soon as possible and within twelve months of publication to the archive.

Committed to earn the public's trust

Dr. Zerhouni continues to seek advice from the public through the Council of Public Representatives (COPR), a recent public trust workshop, and, more locally, through community liaison efforts. He is committed as well to producing the most scientifically-accurate, useful and accessible health information through public health campaigns, fact sheets, over the Web and through a full complement of outreach efforts with special attention to cultural competence designed to keep the public informed.

Enhanced the leadership of NIH

Since becoming the NIH Director, Dr. Zerhouni named a new NIH Deputy Director (Raynard S. Kington, M.D., Ph.D.) and directors for nine institutes and three centers: Center for Scientific Review (Antonio Scarpa, M.D., Ph.D.), John E. Fogarty International Center (Roger I. Glass, M.D., Ph.D.), National Cancer Institute (John E. Niederhuber, M.D.), National Center for Research Resources (Barbara Alving, M.D.), National Heart, Lung, and Blood Institute (Elizabeth G. Nabel, M.D.), National Institute of Diabetes and Digestive and Kidney Diseases (Griffin P. Rodgers, M.D.), National Institute of Environmental Health Sciences and the National Toxicology Program (David A. Schwartz, M.D.), National Institute of General Medical Sciences (Jeremy M. Berg, Ph.D.), National Institute of Mental Health (Thomas R. Insel, M.D.), National Institute of Neurological Disorders and Stroke (Story C. Landis, Ph.D.), National Institute on Alcohol Abuse and Alcoholism (Ting-Kai Li, M.D.), National Institute on Drug Abuse (Nora D. Volkow, M.D.), and National Center for Complementary and Alternative Medicine (Josephine Briggs, M.D.).

Prior to joining the NIH, Dr. Zerhouni served as executive vice-dean of Johns Hopkins University School of Medicine, chair of the Russell H. Morgan department of radiology and radiological science, and Martin Donner professor of radiology, and professor of biomedical engineering. Before that, he was vice dean for research at Johns Hopkins.

Dr. Zerhouni's imaging research has led to advances in Computerized Axial Tomography (CAT scanning) and Magnetic Resonance Imaging (MRI). It has earned him a Gold Medal from the American Roentgen Ray Society for CT research and two Paul Lauterbur Awards for MRI research. Dr. Zerhouni has also received the Special Presidential Award of the European Congress of Radiology.

From 1998–2002, he served on the National Cancer Institute's Board of Scientific Advisors. He was a consultant to both the World Health Organization (1988), and to the White House under President Ronald Reagan (1985).

In April 2008, France bestowed its highest honor on Dr. Zerhouni. In a ceremony at Elysée Palace in Paris, French President Nicholas Sarkozy made him a Knight of the Légion d'honneur (French National Order of the Legion of Honor).

He has been a member of the Institute of Medicine since 2000.

Dr. Zerhouni is the author of 212 publications and holds 8 patents.

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

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NIH IMAGE BANK

The NIH Image Bank contains images from the collections of the 27 institutes and centers that comprise the National Institutes of Health. Contents include general biomedical and science-related images, clinicians, computers, patient care-related images, microscopy images, and various exterior images.

PRESIDENTIAL IMAGES

President Franklin D. Roosevelt dedicated the new NIH campus in Bethesda on October 31, 1940. This event was held to celebrate NIH's historic move from one building in Washington, D.C. to its new campus setting in Maryland on 45 acres of land donated by Luke and Helen Wilson.
lo-res | hi-res

On June 22, 1951, President Harry S Truman applied the first trowel of mortar to the NIH Clinical Center cornerstone. To symbolize advances in clinical medicine at the time, the cornerstone included samples of therapeutic aids, drugs, and techniques and devices to represent diagnosis, treatment and prevention of disease.
lo-res | hi-res

President Lyndon B. Johnson stepping off helicopter onto the lawn of the NIH Clinical Center, August 9, 1965. He is being greeted by PHS Surgeon General William H. Stewart, NIH Director Dr. James Shannon, and Dr. Jack Masur, Clinical Center Director.
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President Johnson with PHS Surgeon General William H. Stewart and NIH Director Dr. James Shannon arrived at the NIH on August 9, 1965, to sign into law an extension of the Research Facilities Construction Program. In his remarks, President Johnson noted that "Here on this quiet battleground our Nation today leads a worldwide war on disease."
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Dr. Theodore Cooper, President Gerald Ford, and Dr. Donald S. Fredrickson listening to HEW Secretary Casper Weinberger speak at the July 1, 1975, swearing in ceremonies of Dr. Cooper as the HEW Assistant Secretary for Health, and Dr. Fredrickson as Director of the NIH.
lo-res | hi-res

President Gerald Ford speaking at the July 1, 1975, ceremony swearing in Dr. Donald S. Fredrickson as NIH Director. In his speech, President Ford says of the NIH "Through your accomplishments, NIH has become a symbol of hope, not just for the patients who are here in this or the other buildings, but all people, everywhere."
lo-res | hi-res

President Gerald Ford observes Dr. Donald S. Fredrickson taking his oath of office as Director of the National Institutes of Health on July 1, 1975. HEW Secretary Casper Weinberger administers the oath as Mrs. Fredrickson holds the family Bible.
lo-res | hi-res

President Gerald Ford shakes hands with NIH staff, patients, and guests at the Clinical Center. He was on hand to observe the swearing in of Dr. Donald S. Fredrickson as the Director of the NIH, July 1, 1975.
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First Lady Rosalyn Carter, and Mrs. James Callaghan, wife of the British Prime Minister, are shown speaking with a patient in the Clinical Center's Laminar Flow Room facilities. Mrs. Carter and Mrs. Callaghan visited the Clinical Center on March 11, 1977.
lo-res | hi-res

On March 11, 1977, First Lady Rosalyn Carter, and Mrs. James Callaghan, wife of the British Prime Minister, visited the NIH campus and met with NIH Director Dr. Donald S. Fredrickson for a tour of the Clinical Center.
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On July 23, 1987 President Ronald Reagan visited the NIH Clinical Center to announce his 13-member Commission on the Human Immunodeficiency Virus Epidemic. HHS Secretary Otis R. Bowen and President Ronald Reagan listen as NIH Director James B. Wyngaarden briefed the president on the NIH's efforts in fighting AIDS.
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HHS Secretary Otis R. Bowen and NIH Director James B. Wyngaarden greet President Ronald Reagan during his July 23, 1987 visit to the NIH Clinical Center. President Reagan visited the NIH to announce his 13-member Commission on the Human Immunodeficiency Virus Epidemic.
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President Ronald Reagan, HHS Secretary Otis R. Bowen, Dr. James B. Wyngaarden and members of the Commission on the Human Immunodeficiency Virus Epidemic. In his remarks, the president said, "I hope the commission will help us all put aside our suspicions and work together with common sense against this threat."
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President Bill Clinton speaking with HHS Secretary Donna Shalala and NIH Director Dr. Harold Varmus after the cornerstone dedication ceremony for the Dale and Betty Bumpers Vaccine Research Center on June 9, 1999.
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Mrs. Betty Bumpers, President Bill Clinton, and Sen. Dale Bumpers during the cornerstone dedication ceremony for the Dale and Betty Bumpers Vaccine Research Center on June 9, 1999. In his speech, President Clinton praised the Bumpers by saying "It is entirely fitting that today we dedicate this state-of-the-art facility to them. They are two great Americans."
lo-res | hi-res

On June 9, 1999, HHS Secretary Donna Shalala, President Bill Clinton, Arkansas Sen. Dale Bumpers, and Mrs. Betty Bumpers unveil the cornerstone to the Dale and Betty Bumpers Vaccine Research Center. President Clinton called the NIH "one of America's great citadels of hope, not only for our people, but also for the world."
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President George W. Bush tours the Vaccine Research Center on February 2, 2003. He is accompanied by (from left) NIAID Director Anthony Fauci, NIH Director Elias A. Zerhouni, HHS Secretary Tommy Thompson, and Secretary of the Department of Homeland Security, Tom Ridge.
lo-res

President George W. Bush delivers an address on Project BioShield to a full audience at Natcher Auditorium during his visit to NIH on February 3, 2003.
lo-res

President George W. Bush visits NIH on May 12, 2004 and participates in a panel discussion about reading education and development. Touting his No Child Left Behind legislation and its Reading First initiative, President Bush talks with other panel members, including G. Reid Lyon (l) of NICHD and Alabama kindergarten teacher Cynthia Henderson (r).
lo-res

President George W. Bush visited NIH on November 1, 2005 to announce the government's pandemic influenza preparations and response. At a Natcher Bldg. address of just under half an hour, he outlined a $7.1 billion plan to meet the threat of avian flu. Bush credited NIH for more than a century of work "at the forefront of this country's efforts to prevent, detect and treat disease, and I appreciate the good work you're doing here. This is an important facility, an important complex, and the people who work here are really important to the security of this nation."
lo-res | hi-res

President George W. Bush visits NIH on January 26, 2005 to hold a 40-minute town hall meeting in Masur auditorium called strengthening health care. Greeting him in the lobby of the Clinical Research Center is: NIH director Dr. Elias Zerhouni joined by NCI director Dr. Andrew von Eschenbach (l) and Maryland Gov. Robert L. Ehrlich, Jr.
lo-res

On January 17, 2007, President George W. Bush makes his fifth visit to the NIH campus during his presidency. In his tour of a cancer research laboratory and a roundtable discussion, the president learned about the Cancer Genome Atlas project and other NIH-funded research efforts.
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On Thursday, April 10, 2008, French President Nicolas Sarkozy awarded NIH Director Dr. Elias A. Zerhouni the Légion d'honneur (French National Order of the Legion of Honor), the highest decoration in France. In the United States, Generals of the Army Dwight D. Eisenhower and Douglas MacArthur, are among the Americans who have received the honor. Others include General Wesley Clark, Actor Kirk Douglas, Film Producer and Actor Clint Eastwood, and former Secretary of State Colin Powell.
Photo Credit: Service Photo Elysée A.R. lo-res | hi-res

President Barack Obama (right) gets an update on NIH activities from NIH director Dr. Francis Collins (third from left). Also on hand are (from left) Bill Corr, deputy HHS secretary; HHS Secretary Kathleen Sebelius and Dr. John Holdren, the President's science advisor.
lo-res | hi-res

From left, HHS Secretary Kathleen Sebelius, NIH director Dr. Francis Collins and President Barack Obama tour the Mark O. Hatfield Clinical Research Center at NIH.
lo-res | hi-res

CAMPUS PHOTOS

Building 1, the "Shannon Building," serves as NIH headquarters in the heart of the campus in Bethesda, Maryland.
lo-res | hi-res

Building 10, the "Warren Grant Magnuson Clinical Center," has served as the nation's clinical research hospital since 1953.
lo-res | hi-res

The Mark O. Hatfield Clinical Research Center opened in 2005. The facility houses inpatient units, day hospitals, and research labs and connects to the original Warren Grant Magnuson Clinical Center. Together, the Magnuson and Hatfield buildings form the NIH Clinical Center. The Clinical Center provides patient care and the environment clinical researchers need to advance clinical science. It was named in honor of Senator Mark O. Hatfield of Oregon, who supported medical research throughout his congressional career.
lo-res | hi-res

The Children's Inn at NIH provides pediatric patients and their families a place to stay during treatment at the Clinical Center.
hi-res

The Edmond J. Safra Family Lodge at NIH is the temporary residence for families and loved ones of adult patients receiving care at the Clinical Center.
lo-res | hi-res

Building 16, the "Lawton Chiles International House," is a locus for international activities supported by NIH and the Department of Health and Human Services (HHS).
lo-res | hi-res

The C.W. Bill Young Center (Building 33) is a new laboratory complex constructed for the National Institute of Allergy and Infectious Diseases (NIAID) to expand its research programs for developing new and improved diagnostics, vaccines, and treatments for emerging diseases caused by infectious agents that may occur naturally or be deliberately released into civilian populations.
lo-res | hi-res

Buildings 38 (and 38A—shown in the background) house the National Library of Medicine, the world's largest collection of medical literature, and the Lister Hill National Center for Biomedical Communications, the research component of the NLM.
lo-res | hi-res

Building 40, the "Dale and Betty Bumpers Vaccine Research Center," was established to facilitate research in vaccine development.
lo-res | hi-res

Building 45, the "William H. Natcher Building," is the gateway to the NIH campus. It houses a 1,000-seat auditorium, nine conference rooms, a spacious cafeteria, and underground parking for visitors.
lo-res | hi-res

Building 50, "The Louis Stokes Laboratories," provides 250,000 GSF of state-of-the-art laboratory, office and conference facilities for scientists from nine NIH Institutes.
lo-res | hi-res

This view of the NIH campus looks north past the Natcher Building (right) to the Stokes Labs (center) and beyond to the Clinical Center (upper left). Building 31, the "Claude D. Pepper Building," (upper right) provides office space for most Institute directors and their immediate staff.
lo-res | hi-res

This view of the NIH campus looks south beyond the Stokes Labs and Natcher Building (center) to the reflective façade of the National Library of Medicine (upper right).
lo-res | hi-res

HISTORICAL PHOTOS OF SCIENTISTS

The NIH began in 1887 as a one-room Hygienic Laboratory in this Marine Hospital on Staten Island, New York. The Hygienic Laboratory was located here until 1891, when it was moved to Washington, D.C.
lo-res

This is a photograph of a PHS research laboratory, circa 1899. The staff is shown at workstations with microscopes and laboratory glassware.
lo-res

In 1910, U.S. Public Health Service workers prepared poisons to be used for the extermination of plague-carrying rats.
lo-res

In 1910, researchers worked at a U.S. Public Health Service laboratory equipped with a bunsen burner, microscope, and petri dishes.
lo-res

In 1916, Dr. Ida A. Bengston became the first woman on the professional staff at the U.S. Public Health Service Hygienic Laboratory. Dr. Bengston worked on ways of developing vaccines for spotted fever.
lo-res

In 1929, field laboratory technicians for the Rocky Mountain Laboratory collected research specimens from the north side of Blodgett canyon, Montana.
lo-res

A 1937 NIH laboratory technician surrounded by tools of the trade; a rack of cotton-stoppered test tubes, a microscope and various glass jars.
lo-res

In 1939, laboratory technicians performed tick research at a field laboratory in Boulder, Colorado. The laboratory was equipped with a refrigerator, an autoclave, and a wood-burning stove.
lo-res

In 1946, researchers work at a field laboratory set up in the basement of the Kew Gardens apartments in New York City.
lo-res

In 1953, NIH scientists were seeking the cause of the hypersensitivity that develops during a 10-21 day lapse after infection before the onset of rheumatic fever or nephritis.
lo-res

In 1954, NIH researchers were studying weight and blood changes in rats with folic acid deficiency.
lo-res

In 1975, NIH's central computer facility housed computers to aid in the collection, analysis and display of data from laboratory instruments, such as this mass spectrometer.
lo-res

Dr. Martin Rodbell, former scientific director of NIEHS, won the 1994 Nobel Prize in Physiology or Medicine. Photo courtesy of Andrew M. Rodbell.
lo-res | hi-res

Former NIEHS Director Kenneth Olden (l) with senior members of the NIEHS component of the team that identified the first breast cancer susceptibility gene, BRCA1. Also pictured (left to right) are Dr. J. Carl Barrett, Dr. Roger W. Wiseman, and Dr. Andrew Futreal. Photo by Steven R. McCaw.
lo-res | hi-res

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U.S. Department of Health & Human Services

National Institutes of Health
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Legislative Chronology

1700 | 1800 | 1900 | 1910 | 1920 | 1930 | 1940 | 1950 | 1960 | 1970 | 1980 | 1990 | 2000 | 2010

This legislative chronology is limited to enactments that had a major influence upon the Marine Hospital Service as it evolved into the PHS, to legislation leading to the establishment of the National Institutes of Health, and to specific NIH legislation with the exception of appropriations bills, unless such bills provided significant new authorities for or restrictions on NIH components. To view the actual public law, see the Office of NIH History website http://history.nih.gov/research/sources_legislative_chronology.html.

1700

July 16, 1798—"An Act for the relief of sick and disabled Seamen" established the Marine Hospital Service for merchant seamen. The Marine Hospital Service—forerunner of the present-day PHS—became a component of the Treasury Department. A monthly hospital tax of 20 cents was deducted from the pay of merchant seamen in the first prepaid medical care plan in the United States. (1 Stat. L. 605.)

March 2, 1799—An amending act to the legislation of 1798 extended Marine Hospital Service benefits to officers and men of the U.S. Navy. This arrangement continued until 1818 after which the Navy built its own hospitals. However, the deduction of 20 cents per month from the pay of Navy and Marine Corps personnel continued until June 15, 1943. (1 Stat. L. 729.)

1800

June 29, 1870—A bill to reorganize the Marine Hospital Service and establish a central controlling office in Washington, D.C., was enacted. This act also increased the amount of hospital tax paid by seamen from 20 cents to 40 cents per month, a tax which continued until 1884. (16 Stat. L. 169.) (After the seamen's hospital tax was abolished July 1, 1884, the cost of maintaining Marine hospitals was paid out of a tonnage tax until 1906. Since then medical care for merchant seamen and other beneficiaries of the service has been supported by direct congressional appropriations.)

March 3, 1875—An act was passed authorizing the admission of seamen from the Navy and other government services to Marine hospitals on a reimbursable basis.

The Surgeon General of the Marine Hospital Service was to be appointed by the President, by and with the advice and consent of the Senate. (18 Stat. L. 377.)

April 29, 1878—The first Federal Quarantine Act "to prevent the introduction of contagious or infectious diseases into the United States" was passed. (20 Stat. L. 37.)

March 3, 1879—The National Board of Health was created by law and given quarantine powers; first organized, comprehensive Federal medical research effort. (20 Stat. L. 484.)

January 4, 1889—A bill to establish a commissioned officer corps in the Marine Hospital Service was passed. This law established a mobile corps subject to duty anywhere upon assignment, a policy that had been in effect since Dr. Woodworth assumed leadership of the Marine Hospital Service in 1871. (25 Stat. L. 639.)

March 27, 1890—Congress gave the Marine Hospital Service interstate quarantine authority. (26 Stat. L. 31.)

February 15, 1893—A new Quarantine Act was passed following outbreaks of cholera in Europe, strengthening the inadequate Quarantine Act of 1878 by giving the Federal Government the right of quarantine inspection. The act of March 3, 1879, was repealed. (27 Stat. L. 449.)

March 2, 1899—The Marine Hospital Service was directed by Congress to investigate leprosy in the United States. (30 Stat. L. 976.)

1900

March 3, 1901—An appropriation of $35,000 was made for the Hygienic Laboratory building (first legislative mention of Hygienic Laboratory). Thus "investigations of contagious and infectious diseases and matters pertaining to public health" were given definite status in law. (31 Stat. L. 1086.)

July 1, 1902—A bill to increase the efficiency and change the name of the Marine Hospital Service to Public Health and Marine Hospital Service was enacted. The law authorized the establishment of specified administrative divisions and, for the first time, designated a bureau of the Federal Government as an agency in which public health matters could be coordinated. (32 Stat. L. 712.)

Another law, usually referred to as the Biologics Control Act, authorized the Public Health and Marine Hospital Service to regulate the transportation or sale for human use of viruses, serums, vaccines, antitoxins, and analogous products in interstate traffic or from any foreign country into the United States. (P.L. 57-244, 32 Stat. L. 728.)

1910

August 14, 1912—Under an act, the name Public Health and Marine Hospital Service was changed to Public Health Service. The legislation broadened the PHS research program to include "diseases of man" and contributing factors such as pollution of navigable streams, and information dissemination. (37 Stat. L. 309.)

July 9, 1918—The Chamberlain-Kahn Act provided for the study of venereal diseases by the PHS. (40 Stat. L. 886.)

October 27, 1918—A PHS reserve corps was established. The 1918 influenza pandemic emphasized the need for a reserve corps to meet such emergency situations. (40 Stat. L. 1017.)

1920

January 19, 1929—The Narcotics Control Act provided for construction of two hospitals for the care and treatment of drug addicts, and authorized creation of a Narcotics Division in the PHS Office of the Surgeon General. (P.L. 70-672, 45 Stat. L. 1085.)

1930

April 9, 1930—A law changed the name of the Advisory Board for the Hygienic Laboratory to the National Advisory Health Council. (P.L. 71-106, 46 Stat. L. 152.)

May 26, 1930—The Ransdell Act reorganized, expanded, and redesignated the Hygienic Laboratory as the National Institute of Health. The act authorized $750,000 for the construction of two buildings for NIH and authorized a system of fellowships. (P.L. 71-251, 46 Stat. L. 379.)

June 14, 1930—A law authorized creation of a separate Bureau of Narcotics in the Treasury Department to control trading in narcotic drugs and their use for therapeutic purposes. Also, the legislation redesignated the PHS Narcotics Division to the Division of Mental Hygiene, giving the Surgeon General authority to investigate abuse of narcotics and the causes, treatment, and prevention of mental and nervous diseases. (P.L. 71-357, 46 Stat. L. 585.)

August 14, 1935—The Social Security Act was an event of major importance in the progress of public health in the United States. This act authorized health grants to the states on the principle that the most effective way to prevent the interstate spread of disease is to improve state and local public health programs. With this legislation, the PHS became adviser and practical assistant to state and local health services. (P.L. 74-271, 49 Stat. L. 634.)

August 5, 1937—A law established the National Cancer Institute to conduct and support research relating to the cause, diagnosis, and treatment of cancer. The law authorized the Surgeon General to make grants-in-aid for research in the field of cancer, provide fellowships, train personnel, and assist the states in their efforts toward cancer prevention and control. (P.L. 75-244, 50 Stat. L. 559.)

April 3, 1939—The Reorganization Act of 1939 transferred the PHS from the Treasury Department to the Federal Security Agency. (P.L. 76-19, 53 Stat. L. 561.)

1940

July 1, 1944—The PHS act consolidated and revised laws pertaining to the PHS and divided the service into the Office of the Surgeon General, Bureau of Medical Services, Bureau of State Services, and the National Institute of Health. The act gave the Surgeon General broad powers to conduct and support research into the diseases and disabilities of man, authorized projects and fellowships, and made the National Cancer Institute a division of NIH. The act also empowered the Surgeon General to treat at PHS medical facilities, for purposes of study, persons not otherwise eligible for such treatment. (P.L. 78-410, 58 Stat. L. 682.) Under this provision, the Clinical Center was later established. (Under this act, the Research Grants Office, January 1, 1946; the Experimental Biology and Medicine Institute and the National Microbiological Institute, November 1, 1948; and the Division of Research Services, January 1, 1956, were established.)

July 3, 1946—The National Mental Health Act was designed to improve the mental health of U.S. citizens through research into the causes, diagnosis, and treatment of psychiatric disorders. It authorized the Surgeon General to support research, training, and assistance to state mental health programs. (P.L. 79-487, 60 Stat. L. 421.) (The National Institute of Mental Health was established under the authority of this law on April 15, 1949.)

August 13, 1946—The Hospital Survey and Construction Act (Hill-Burton Act) authorized grants to the states for construction of hospitals and public health centers, for planning construction of additional facilities, and for surveying existing hospitals and other facilities. (P.L. 79-725, 60 Stat. L. 1040.)

July 8, 1947—Under P.L. 80-165, research construction provisions of the Appropriations Act for FY 1948 provided funds "for the acquisition of a site, and the preparation of plans, specifications, and drawings, for additional research buildings and a 600-bed clinical research hospital and necessary accessory buildings related thereto to be used in general medical research...."

June 16, 1948—The National Heart Act authorized the National Heart Institute to conduct, assist, and foster research; provide training; and assist the states in the prevention, diagnosis, and treatment of heart diseases. In addition, the act changed the name of National *Institute* of Health to National *Institutes* of Health. (P.L.

80-655, 62 Stat. L. 464.)

June 24, 1948—The National Dental Research Act authorized the National Institute of Dental Research to conduct, assist, and foster dental research; provide training; and cooperate with the states in the prevention and control of dental diseases. (P.L. 80-755, 62 Stat. L. 598.)

1950

August 15, 1950—The Omnibus Medical Research Act authorized the Surgeon General to establish the National Institute of Neurological Diseases and Blindness, as well as additional institutes, to conduct and support research and research training relating to other diseases and groups of diseases. (P.L. 81-692, 64 Stat. L. 443.) (The National Institute of Arthritis and Metabolic Diseases and the National Institute of Neurological Diseases and Blindness were established under the authority of this act on November 22, 1950. Under this same act, the National Institute of Allergy and Infectious Diseases was established on December 29, 1955, replacing the National Microbiological Institute which was originally established November 1, 1948, under authority of section 202 of the PHS act.)

April 1, 1953—Reorganization plan #1 assigned the PHS to the new Department of Health, Education, and Welfare.

July 28, 1955—The Mental Health Study Act authorized the Surgeon General to award grants to non-governmental organizations for partial support of a nationwide study and reevaluation of the problems of mental illness. Under this act, the Joint Committee on Mental Illness and Health was awarded grant support for 3 years. (P.L. 84-182, 69 Stat. L. 381.)

July 3, 1956—The National Health Survey Act authorized the Surgeon General to survey sickness and disabilities in the United States on a sampling basis. (P.L. 84-652, 70 Stat. L. 489.)

July 28, 1956—The Alaska Mental Health Enabling Act provided for territorial treatment facilities to eliminate the need to transport the mentally ill outside Alaska. It also authorized PHS grants to Alaska for its mental health program. (P.L. 84-830, 70 Stat. L. 709.)

July 30, 1956—The Health Research Facilities Act of 1956 (Title VII of the PHS act) authorized a PHS program of Federal matching grants to public and nonprofit institutions for the construction of health research facilities. (P.L. 84-835, 70 Stat. L. 717.)

August 2, 1956—The Health Amendments Act of 1956 authorized the Surgeon General to assist in increasing the number of adequately trained nurses and professional public health personnel. It also authorized PHS grants to support the development of improved methods of care and treatment of the mentally ill. (P.L. 84-911, 70 Stat. L. 923.)

August 3, 1956—An amendment to Title III of the PHS act, the National Library of Medicine Act, placed the Armed Forces Medical Library under the PHS, and renamed it the National Library of Medicine. (P.L. 84-941.)

June 30, 1958—The Mutual Security Act of 1958 amended P.L. 83-480, authorizing the President to enter into agreements with friendly nations to use foreign currencies accruing under title I for collection, translation, and dissemination of scientific information and to conduct research and support scientific activities overseas. (P.L. 85-477.)

1960

July 12, 1960—Congress passed the International Health Research Act. The law authorized the Surgeon General to establish and make grants for fellowships in the United States and participating foreign countries; make grants or loans of equipment and other materials to participating foreign countries for use by public or nonprofit institutions and agencies; participate in international health meetings, conferences, and other activities; and facilitate the interchange of research scientists and experts between the United States and participating foreign countries. (P.L. 86-610, 74 Stat. L. 364.)

September 15, 1960—A law amended the PHS act to authorize grants-in-aid to universities, hospitals, laboratories, and other public and nonprofit institutions to strengthen their programs of research and research training in the sciences related to health. The act also authorized the use of funds appropriated for research or research training to be set aside by the Surgeon General in a special account for general research support grants. (P.L. 86-798, 74 Stat. L. 1053.)

October 17, 1962—An act authorized the Surgeon General to establish the National Institute of General Medical Sciences and the National Institute of Child Health and Human Development. The latter was authorized to conduct and support research and training relating to maternal health; child health; human development, in particular the special health problems of mothers and children; and the basic sciences relating to the processes of human growth and development. The former was authorized to conduct and support research in the basic medical sciences and related behavioral sciences that have significance for two or more institutes, or which are outside the general area of responsibility of any other institute. (P.L. 87-838, 76 Stat. L. 1072.) (On January 30, 1963, the NICHD and the NIGMS were established under this act.)

September 24, 1963—A law amended the Health Research Facilities Act of 1956 (Title VII to the PHS act) to allow grants for multipurpose facilities that would provide teaching space as well as essential research space. (P.L. 88-129, 77 Stat. L. 164.)

October 24, 1963—The Maternal and Child Health and Mental Retardation Planning Amendments of 1963 amended the Social Security Act of 1935 by authorizing a five-point grant program of $265 million, over a 5-year period. Major provisions designed to prevent mental retardation included increased Federal grants for maternal and child health services and crippled children's service administered by the Children's Bureau; a new 5-year program of grants to the states for health care of expectant mothers who have, or are likely to have, conditions associated with childbearing which may lead to mental retardation; funds for research to improve maternal and child health and crippled children's services; and grants to the states to assist in developing plans for comprehensive state and community programs to combat mental retardation. (P.L. 88-156, 77 Stat. L. 273.)

October 31, 1963—A companion measure to P.L. 88-156 was the Mental Retardation Facilities and Community Mental Health Centers Construction Act of 1963. This act authorized a total of $329 million over 5 years for grants to assist in the construction of mental retardation research centers and community mental health centers, and to train teachers of mentally retarded and other handicapped children. (P.L. 88-164, 77 Stat. L. 282.)

August 18, 1964—The Hospital and Medical Facilities Amendments of 1964 extended the Hospital Survey and Construction Act of 1946 (Hill-Burton Act) for 5 years with a total authorization of $1.4 billion. (P.L. 88-443, 78 Stat. L. 447.)

August 27, 1964—Graduate Public Health Training Amendments of 1964 extended the authorization for public health traineeships and training grants to schools of public health, nursing, and engineering for 5 years, through June 30, 1969. (P.L. 88-497, 78 Stat. L. 613.)

September 19, 1964—The Appropriations Act for 1965 included $10 million for establishment of a virus-leukemia program. (P.L. 88-605.)

August 4, 1965—The Mental Retardation Facilities and Community Mental Health Centers Construction Act Amendments of 1965 provided monies through FY 1972 to help finance initial staffing of community mental health centers which were authorized in the original act; extended and increased appropriations authority for mental retardation education research and demonstration projects; and authorized increased annual funds through FY 1969 for training teachers of the handicapped young. (P.L. 89-105.)

August 9, 1965—The Health Research Facilities Amendments of 1965 extended the program for construction of health research facilities for 3 years with $280 million authorized for that period in lieu of the previous $50 million annual appropriations authorizations. (P.L. 89-115.)

August 31, 1965—A supplemental appropriations act resulting from recommendations of the President's Commission on Heart Disease, Cancer and Stroke provided an additional $20,250,000 (shared by NCI, NHI, NIGMS and NINDB) to intensify and expand support of research in the three major "killer" diseases. (P.L. 89-156.)

October 6, 1965—The Heart Disease, Cancer and Stroke Amendments of 1965 provided for establishment of regional cooperative programs in research, training, continuing education and demonstration activities in patient care among medical schools, clinical research institutions and hospitals so that the latest treatment methods for the three diseases may be more widely available to patients. Under this act, the Division of Regional Medical Programs was created February 1, 1966. (P.L. 89-239.)

October 22, 1965—The Medical Library Assistance Act was passed, authorizing NLM's extramural programs. (P.L. 89-291.)

August 3, 1968—A law authorized the designation of a national center for biomedical communications as the Lister Hill National Center for Biomedical Communications. (P.L. 90-456.)

August 16, 1968—An amendment to the PHS act authorized the secretary to establish a National Eye Institute and to rename NINDB the National Institute of Neurological Diseases. The new institute was formed from NINDB programs to conduct and support research for new treatment and cures, and training relating to blinding eye diseases and visual disorders. (P.L. 90-489.)

The Health Manpower Act of 1968 extended and expanded the following five health laws then in effect: Health Professions Educational Assistance Act of 1963, as amended; Nurse Training Act of 1964, as amended; Allied Health Professions Personnel Training Act of 1966; Health Research Facilities Act of 1956, as amended; and Public Health Service Act of 1944, as amended. The measure provided a 2-year extension, through FY 1971, of the above legislation except for the Allied Health Professions Act, extended only through FY 1970. (P.L. 90-490.)

October 24, 1968—The President signed legislation further amending the name of NIND to National Institute of Neurological Diseases and Stroke. (P.L. 90-639.)

1970

March 12, 1970—An amendment to the PHS act extended and made coterminous through June 30, 1973, the authority to make formula grants to schools of public health, project grants for graduate training in public health, and traineeships for professional public health personnel. (P.L. 91-208, 84 Stat. 52.)

March 13, 1970—The Medical Library Assistance Extension Act of 1970 amended the PHS act to improve and extend the provisions relating to assistance to medical libraries and related instrumentalities for 3 years through June 30, 1973. (P.L. 91-212, 84 Stat. 63.)

October 30, 1970—The PHS act was amended to provide: 1) extension of research contract authority in areas of public health through June 30, 1974; 2) authorization of mission-related clinical training (as well as research training) by the NIGMS; 3) clarification of terms in the regulation of biological products; 4) clarifying and technical directives relating to appointment, compensation and functions of advisory councils and committees, and 5) extension of statutory authority for regional medical programs, comprehensive medical planning, and health services research and development. (P.L. 91-515.)

November 2, 1970—The Health Training Improvement Act of 1970 extended and amended allied health professions training authority (which expired June 30, 1970) and established eligibility of new health professions educational assistance schools for "start-up" grants. (P.L. 91-519.)

December 24, 1970—The Congress enacted the Family Planning Services and Population Research Act of 1970 to expand, improve and better coordinate family planning services and population research activities of the Federal Government. (P.L. 91-572.)

May 22, 1971—Congress passed into law the Supplemental Appropriations Bill, which included $100 million for cancer research. This appropriation was made in response to the President's State of the Union address, in which he called for "an intensive campaign to find a cure for cancer." The appropriation includes authority under grants and contracts, as well as direct construction authority for NCI. (P.L. 92-18.)

July 9, 1971—A law amended the Public Health Service Act to provide for extension of student loan scholarship programs for up to four fiscal years. (P.L. 92-52.)

November 18, 1971—The President signed the Comprehensive Health Manpower Training Act of 1971 to provide increased manpower in the health professions, and the Nurse Training Act of 1971 to provide training for increased numbers of nurses. (P.L. 92-157, P.L. 92-158.)

December 23, 1971—The National Cancer Act of 1971 enlarged the authorities of NCI and NIH in order to advance the national effort against cancer. The authority of the director, NCI, was expanded, a National Cancer Advisory Board was established, and appropriations in excess of $400 million were authorized for 1972, with further increases in subsequent years. (P.L. 92-218.)

May 16, 1972—The National Sickle Cell Anemia Control Act of 1972 became law and established a national program for diagnosis and treatment of, and counseling and research in, sickle cell disease. (P.L. 92-294.)

May 19, 1972—The need for further support of research and training in the field of digestive diseases was emphasized by adding a new section 434 to the PHS act and renaming NIAMD the National Institute of Arthritis, Metabolism, and Digestive Diseases. (P.L. 92-305.)

August 29, 1972—The National Cooley's Anemia Control Act authorized over $9 million for 3 years for research in the diagnosis and treatment of Cooley's anemia, and for counseling and public information programs. (P.L. 92-414.)

September 19, 1972—The National Heart, Blood Vessel, Lung, and Blood Act expanded the authorities of the National Heart and Lung Institute to augment the national effort against heart, lung, and blood diseases. Appropriations of $375 million for 1973 were authorized with further increases in subsequent years. (P.L. 92-423.)

October 25, 1972—The National Advisory Commission on Multiple Sclerosis Act established a commission charged to determine the most productive avenue of researching possible causes and cures of MS, and make specific recommendations for the maximum utilization of national resources directed toward MS. (P.L. 92-563.)

June 18, 1973—The Health Programs Extension Act of 1973 extended the medical library assistance programs of NLM (with the exception of the construction program) for 1 year. Population research and family planning activities were also extended through FY 1974, along with other Federal health programs. (P.L. 93-45.)

November 16, 1973—The Emergency Medical Services System Act of 1973 amended the PHS act to provide assistance and encouragement for the development of comprehensive area emergency medical services systems, including grants and contracts for the support of research in emergency medical techniques, methods, devices, and delivery. (P.L. 93-154.)

April 22, 1974—The Sudden Infant Death Syndrome Act of 1974 amended the PHS act to authorize specific and general research on the sudden infant death syndrome through the NICHD. The collection, analysis, and public dissemination of information and data and the support of counseling programs were also authorized. The act did not authorize specific funds for research, but did authorize appropriations of $9 million over a 3-year period for the other programs. (P.L. 93-270.)

May 31, 1974—The Research on Aging Act of 1974 established a National Institute on Aging. The act authorized the NIA to conduct and support biomedical, social, and behavioral research and training related to the aging process and the diseases and other special problems and needs of the aged. (P.L. 93-296.)

June 22, 1974—The Energy Supply and Coordination Act directed the secretary through NIEHS to study the effects of chronic exposure to sulfur oxides, and authorized $3.5 million for that purpose. (P.L. 93-319.)

July 12, 1974—The National Research Act of 1974 amended the PHS act by repealing existing research training and fellowship authorities and consolidating such authorities in the national research service awards authority. The NRSAs (both individual and institutional grants) are restricted on the basis of subject area shortages and would involve service obligations and payback provisions. The act established a temporary National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research within the department to make a comprehensive investigation of the ethical principles involved in biomedical and behavioral research (including psychosurgery and living fetus research), and to develop ethical guidelines for conducting such research. Also, a permanent National Advisory Council for the Protection of Subjects of Biomedical and Behavioral Research was to be established. (P.L. 93-348.)

July 23, 1974—The National Cancer Act Amendments of 1974 authorized $2.565 billion over a 3-year period to extend and improve the National Cancer Program as well as $210.5 million over 3 years for cancer control programs. The act also: 1) established the President's Biomedical Research Panel to make a comprehensive investigation of Federal biomedical and behavioral research; 2) extended indefinitely the research contract authority of section 301(h) of the PHS act; 3) provided that the director, NIH, shall be appointed by the President by and with the advice of the Senate; and 4) required peer review of NIH and ADAMHA grant applications and contract projects. (P.L. 93-352.)

The Health Services Research, Health Statistics, and Medical Libraries Act of 1974 extended and amended NLM program authorities ($37.5 million over a 2-year period). The act also extended the FIC's authority to engage in international cooperative efforts in health. (P.L. 93-353.)

The National Diabetes Mellitus Research and Education Act provided for regional research and training centers ($40 million authorized over a 3-year period), a long-range plan prepared by a National Commission on Diabetes, expanded research and training programs, a Diabetes Mellitus Coordinating Committee, and an associate director for diabetes in the National Institute of Arthritis, Metabolism, and Digestive Diseases. (P.L. 93-354.)

October 29, 1974—The Federal Fire Prevention and Control Act authorized $5 million and $8 million for fiscal years 1975-76 for establishment of 25 research and treatment centers, 25 burn units, and 90 burn programs by NIH. (P.L. 93-498.)

January 4, 1975—The National Arthritis Act established a National Commission on Arthritis and Related Musculoskeletal Diseases, authorized $2 million to develop a long-range plan involving research, training, services and data systems; established an associate director for arthritis in NIAMDD; and provided 3-year authorizations for arthritis screening, detection, prevention, and referral projects and for arthritis research and demonstration centers. (P.L. 93-640.)

July 29, 1975—A law extended and amended authorities of Title X relating to family planning and population research and made Title X sole authority for all departmental extramural, collaborative, and intramural research in "biomedical, contraceptive development, behavioral, and program implementation fields related to family planning and population;" and created two temporary national commissions for the control of epilepsy and Huntington's disease. (P.L. 94-63.)

April 22, 1976—The Health Research and Health Services Amendments 1) extended authorization through FY 1977 and amended provisions governing the programs of the National Heart and Lung Institute, placed increased emphasis on blood-related research, and changed the institute's name to the National Heart, Lung, and Blood Institute; 2) mandated studies by the President's Biomedical Research Panel and the National Commission for the Protection of Human Subjects of the implications of public disclosure of information contained in grant applications and contract proposals; 3) authorized broad-based genetic diseases research under section 301 of the PHS act, and provided for programs of counseling, testing, and information dissemination about genetically transmitted diseases; and 4) extended authorization through FY 1977 for national research service awards for NIH and ADAMHA. The act prohibited consideration of political affiliation in making appointments to health advisory committees. (P.L. 94-278.)

October 19, 1976—The 1976 Arthritis, Diabetes, and Digestive Diseases Amendments 1) provided for an arthritis data system; 2) emphasized public information and encouragement of proper treatment for arthritis; 3) established a National Arthritis Advisory Board; 4) provided for a National Diabetes Board; and 5) established a National Commission on Digestive Diseases to develop a long-range plan for research. (P.L. 94-562.)

October 21, 1976—The Emergency Medical Services Amendments of 1976 extended the National Commission on Arthritis; extended the Commission for the Protection of Human Subjects of Biomedical and Behavioral Research; and authorized research and demonstration programs on burn injuries under Title XII of the PHS act. (P.L. 94-573.)

August 1, 1977—Health Planning and Health Services Research and Statistics Extension, Biomedical Research Extension, and Health Services Extension Acts of 1977 continued the following programs through September 30, 1978: the Medical Library Assistance Program; cancer research and control programs; heart, blood vessel, lung and blood disease research, prevention and control programs; national research service awards; population research and voluntary family planning programs; and sudden infant death syndrome information and counseling programs. It also extended various health service programs. (P.L. 95-83.)

August 7, 1977—The Clean Air Act Amendments established a coordinating committee to review and comment on plans, execution, and results of research relating to the stratosphere. NCI and NIEHS are members. It also established a Task Force on Environmental Cancer and Heart and Lung Disease, with NCI, NHLBI, and NIEHS among the members. (P.L. 95-95.)

September 29, 1977—The Food and Agriculture Act of 1977 designated the Department of Agriculture as the lead agency of the Federal Government for agricultural research (except with respect to the biomedical aspects of human nutrition concerned with diagnosis or treatment of disease). The act also required establishment of procedures for coordinating nutrition research in areas of mutual interest between DHEW and Department of Agriculture. (P.L. 95-113.)

November 9, 1977—The Federal Mine Safety and Health Amendments of 1977 gave the HEW secretary authority to appoint an advisory committee on coal or other mine health research. One member of this committee is to be the director of the NIH or delegate. (P.L. 95-164.)

November 23, 1977—The Saccharin Study and Labeling Act extended the Commission for the Protection of Human Subjects until November 1, 1978. (P.L. 95-203.)

November 9, 1978—The Family Planning, Population Research and SIDS Amendments authorized a 3-year extension for the aforementioned programs through FY 1981. This was the only authority for population research programs in NICHD, the Center for Population Research. (P.L. 95-613.)

Amendments to the Community Mental Health Centers Act authorized a 3-year extension for NLM programs, and NRSA's expiring September 30, 1981, and a 2-year extension for each of the following: Community Mental Health Centers, NHLBI, and NCI. This legislation also authorized the secretary, HEW, to: 1) conduct studies and tests of substances for carcinogenicity, teratogenicity, mutagenicity and other harmful biological effects; 2) establish and conduct a comprehensive research program on the biological effects of low-level radiation; 3) conduct and support research and studies on human nutrition; and 4) publish an annual report which lists all substances known to be carcinogenic and to which a significant number of Americans are exposed. (P.L. 95-622.)

Other important provisions of this act included the authority given to the director of NIH to appoint 200 experts and consultants for the use of NIH components other than NCI and NHLBI and the establishment of the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research.

The Health Services Research, Health Statistics, and Health Care Technology Act of 1978 (P.L. 95-623) established in the Office of the Assistant Secretary for Health, the National Center for Health Care Technology, and reauthorized for 3 years the National Center for Health Statistics and the National Center for Health Services Research.

The legislation also established the National Council on Health Care Technology on which the director, NIH, serves as an ex officio member. The director, NIH, is required annually to submit to the center a listing of all technologies under development which appear likely to be used in the practice of medicine.

NLM is required to disseminate, publish, and make available all standards, norms, and criteria developed by the council concerning the use of particular health care technologies. (P.L. 95-623.)

October 17, 1979—The Department of Education Organization Act established a Department of Education and renamed the DHEW the Department of Health and Human Services. (P.L. 96-88.)

December 12, 1979—The Emergency Medical Services Systems Amendments and Sudden Infant Death Syndrome Amendments of 1979 required the NICHD to assure that "adequate amounts" of its appropriated dollars are used for research into identification of infants at risk of SIDS and for prevention of SIDS. In addition, the NICHD is required to provide information on expenditure of funds for these purposes, the number of SIDS grant applications received and approved, the latest research findings on SIDS, and estimate of needs for funds in succeeding years. (P.L. 96-142.)

December 29, 1979—P.L. 96-167 extended the tax exemption for NRSA's for 1 year.

P.L. 96-171 required that the NIH Director, in consultation with the secretary of transportation, conduct a study to determine the effect of aging on the ability of individuals to perform the duties of pilots. The report on the study was to be submitted to Congress within 1 year after enactment.

1980

September 26, 1980—P.L. 96-359 requires the HHS secretary to conduct a study to determine the long-term effects of hypochloremic metabolic ankylosis resulting from chloride-deficient formulas. The responsibility for the study was assigned to NICHD.

December 12, 1980—P.L. 96-517 revised the patent and trademark laws and in particular awarded title to the patent rights for inventions made with Federal assistance to nonprofit organizations and small businesses.

The Clinical Center was redesignated as the Warren Grant Magnuson Clinical Center of NIH. (P.L. 96-518.)

December 17, 1980—P.L. 96-538 reauthorized for 2 years programs for NHLBI and NCI; changed the name of the NIAMDD to the National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, extensively revised its authorities, and reauthorized its programs for 3 years; and required the NINCDS to conduct a study and submit a report on spinal cord regeneration and other neurological research.

P.L. 96-541 extended for 1 year the tax exemption on NRSAs.

August 13, 1981—P.L. 97-35, the Omnibus Budget Reconciliation Act of 1981, reauthorized NRSAs for 2 years through FY 1983, reauthorized the Medical Libraries Assistance program for 1 year, and repealed the prohibition in Title X against using other PHS authority to fund population research, thus eliminating the need for reauthorizations for this program located in the NICHD.

July 22, 1982—The Small Business Innovation Development Act of 1982 requires that each Federal agency with an annual research and development budget exceeding $100 million set aside a certain portion of its extramural R&D budget for a Small Business Innovation Research (SBIR) program as follows: 0.2 percent in FY 1983; 0.6 percent in FY 1984; 1.0 percent in FY 1985; and 1.25 percent in FY 1986 and all subsequent years. (P.L. 97-219.)

September 3, 1982—The Tax Equity and Fiscal Responsibility Act of 1982 included among its provisions an extension of the partial exclusion of NRSAs from taxable gross income. This extension will expire at the end of calendar year 1983; during this time, the Treasury Department will complete a study of the taxability of NRSA's and other government educational grants which, like NRSA's, have payback or service requirements. (P.L. 97-248.)

January 4, 1983—The Orphan Drug Act made changes in the law to encourage development and marketing of orphan drugs (drugs for rare diseases or conditions which are not economically feasible for private industry to develop and market). The act included a requirement to prepare radioepidemiological tables relating radiation-related cancer to specific radiation doses, and a report on the risks of thyroid cancer associated with doses of I_{131}. These responsibilities were assigned to NIH and NCI respectively. The act further provided that NHLBI help develop and support not less than 10 comprehensive sickle cell centers. (P.L. 97-414.)

July 30, 1983—The supplemental appropriations for FY 1983 provided funds for PHS AIDS activities, $9.375 million of which was earmarked for NIH. This marked the first time the Congress directly appropriated money for AIDS research for NIH. The supplemental also provided $5.9 million for NLM and development of a Biomedical Information Communication Center in Portland, Oreg. (P.L. 98-63.).

October 1 and November 17, 1983—Continuing resolutions supported unauthorized NIH programs including NRSA and Medical Library Assistance. (P.L. 98-107 and P.L. 98-151.)

May 24, 1984—P.L. 98-297 designated the convent and surrounding land as the Mary Woodard Lasker Center for Health Research and Education.

October 12 and **November 8, 1984**—Appropriations legislation reauthorized NRSAs, provided construction funds for NIH, and medical library funding. (P.L. 98-473, P.L. 98-619.)

October 19, 1984—The National Organ Transplant Act authorized the secretary to establish a Task Force on Organ Procurement and Transplantation to examine relevant issues and report to the Congress within 12 months. Its membership included the director, NIH, ex officio. OMAR will sponsor the required conference on bone marrow transplantation. (P.L. 98-507.)

October 24, 1984—The Veterans' Dioxin and Radiation Exposure Compensation Standards Act required the director, NIH, to conduct a study of devices and techniques for determining previous radiation exposure and submit a report; to enter into an interagency agreement with the VA administrator to identify agencies capable of furnishing such services; and to provide an independent expert who could prepare radiation dose estimates for use by VA administrator in adjudicating claims. (P.L. 98-542.)

October 30, 1984—The Health Promotion and Disease Prevention Amendments of 1984 amended the PHS act to extend provisions relating to health promotion and disease prevention and to establish centers for research and demonstration in those areas. It required that the director, NIH, be consulted as to procedures for peer review of applications; that NCHSR cooperate with NIH in its responsibilities pertaining to health care technologies; and that the director, NIH, serve on the newly established National Advisory Council on Health Care Technology Assessment. (P.L. 98-551.)

The Human Services Reauthorization Act, Title V, ordered the secretary, through NCI, to establish or support at least one facility for cancer screening and research in St. George, Utah, to be affiliated with a health science center and accessible to most residents of the areas that received greatest fallout from Nevada nuclear tests. (P.L. 98-558.)

August 15, 1985—The Orphan Drug Act was amended, establishing a 20-member National Commission on Orphan Diseases, to be appointed by the secretary (including NIH representative), to assess the activities of NIH and other entities in connection with research and dissemination of knowledge related to rare diseases. NIH was required to allocate to the commission $1 million from its FY 1986 appropriation. (P.L. 99-91.)

November 20, 1985—The Health Research Extension Act of 1985 reauthorized NIH programs for 3 years; established the National Institute of Arthritis and Musculoskeletal and Skin Diseases, renaming the remaining component the National Institute of Diabetes and Digestive and Kidney Diseases; created a new National Center for Nursing Research; established positions of associate director for prevention in OD, NCI, NHLBI, and NICHD; and required the development of guidelines for the care and use of laboratory animals. Additional provisions included establishment of committees to develop a plan for research into methods that reduce animal use or animal pain, to study research on lupus erythematosus, to study the NRSA program, to plan and develop Federal initiatives in spinal cord injury research, to study personnel for health needs of the elderly through the year 2020, to review research activities in learning disabilities, and to review the research programs of NIDDK. The act also established NIH and all of its ICD's in law and consolidated and made uniform many authorities and responsibilities of institute directors and advisory councils. (P.L. 99-158.)

December 12, 1985—Under the Balanced Budget and Emergency Deficit Control Act of 1985 (Gramm-Rudman-Hollings), aimed at reducing the Federal deficit to zero within 5 years, starting in FY 1986, budget authority was reduced in accordance with the deficit targets. For NIH this reduction amounted to $236 million. The revised total NIH appropriation after "sequestration" became $5.3 billion, 4.3 percent below the original FY 1986 appropriation. The mandated across-the-board reduction was applied again to the total amount appropriated to each NIH institute, to each research mechanism, and to each identified program, project, or activity. (P.L. 99-177.)

In the FY 1986 Labor-HHS-Education Appropriation bill, the number of new and competing renewal research project grants to be supported by NIH (6,100) was specified in law for the first time. The act, which included $5.498 billion for NIH, provided that $4.5 million of this amount be transferred to the departmental management account for construction of the Mary Babb Randolph Cancer Center in West Virginia and that $70 million for AIDS research be added to the account of the Office of the Director. (P.L . 99-178.)

December 23, 1985—The Food Security Act, title XVII, subtitle F, amended the Animal Welfare Act, requiring the secretary of agriculture to promulgate standards including exercise of dogs and consideration of the psychological well-being of primates, minimization of pain and distress, use of anesthetics, and consideration of alternatives; formation of an institutional animal committee at each research facility; and provision of annual training for those involved in animal care and treatment. An information service was established at the National Agricultural Library, in cooperation with NLM. Title XIV, subtitle B, required an assessment of existing scientific literature relating to dietary cholesterol and calcium to be conducted by the secretaries of agriculture and HHS. (P.L. 99-198.)

December 28, 1985—P.L. 99-231 designated 1986 as the "Sesquicentennial Year of the National Library of Medicine."

July 2, 1986—The Urgent Supplemental Appropriations Act provided an additional $6 million for NCI cancer research and demonstration centers and specified that funds for the Clinical Center should be available for payment of nurses at rates of pay authorized for VA nurses. (P.L. 99-349.)

October 6, 1986—P.L. 99-443 amended the Small Business Act to extend by 5 years the Small Business Innovation Research Program.

October 16, 1986—P.L. 99-489 designated the period from October 1, 1986, through September 30, 1987, as "National Institutes of Health Centennial Year" and requested the President to issue a proclamation calling upon the people of the United States to observe the year with appropriate ceremonies and activities.

October 18, 1986—P.L. 99-500 and P.L. 99-591 (October 31, corrected version), making continuing appropriations for FY 1987, included $6.18 billion for NIH, a requirement to support 6,200 research project grants, funding for 10,700 research trainees and 559 centers; and $247.7 million in AIDS money for components.

October 20, 1986—The Federal Technology Transfer Act amended the Stevenson-Wydler Technology Innovation Act of 1980, authorizing directors of government-operated Federal laboratories to enter into collaborative R&D agreements with other government agencies, universities, and private organizations; established a Federal Laboratory Consortium in the National Bureau of Standards; and mandated that royalties received by a Federal agency be shared with the inventor. (P.L. 99-502.)

November 14, 1986—Title IX, the Alzheimer's Disease and Related Dementias Services Research Act, of P.L. 99-660 established an interagency council and an advisory panel on Alzheimer's disease (AD). It authorized the director, NIA, to make awards for distinguished research on AD, to plan for and conduct research, to establish an AD clearinghouse, to make a grant to or enter into a contract with a national organization representing Alzheimer's patients, to establish an information system and national toll-free telephone line, and to provide information to caregivers of Alzheimer's patients and to safety and transportation personnel. Title III—Vaccine Compensation—named the director, NIH, as an ex officio member of the newly established Advisory Commission on Childhood Vaccines.

July 11, 1987—The FY 1987 Supplemental Appropriations bill, P.L. 100-71, allocated funds to NIA for clinical trials, to NCNR and HRSA for studies related to the nurse shortage and nurse retention, and to OD/NIH for costs associated with pay raises and the new Federal Employees Retirement System.

September 29, 1987—The Balanced Budget and Emergency Deficit Control Reaffirmation Act of 1987 ("Gramm-Rudman-Hollings II") adjusted the original deficit target reduction in FY 1988 appropriations, including Labor-HHS-Education. (P.L. 100-119.)

October 8, 1987—P.L. 100-126 designated October 1, 1987, as "National Medical Research Day," acknowledging 100 years of contributions by NIH and other federally supported research institutions to improving the health and well-being of Americans and all humankind.

November 29, 1987—The Older Americans Act Amendments, Title III—Alzheimer's Disease Research, authorized the director, NIA, to provide for conduct of clinical trials on therapeutic agents for Alzheimer's disease recommended for further analysis by NIA and FDA. It also authorized the President to call a White House Conference on Aging in 1991. (P.L. 100-175.)

December 22, 1987—P.L. 100-202, making further continuing appropriations for the fiscal year ending September 30, 1988, provided $6.667 billion to NIH, including

$448 million to be allocated among the institutes for AIDS. It also restricted forward or multiyear funding, required expeditious testing of experimental drugs for AIDS, and included $3.8 million for a National Center on Biotechnology Information within NLM.

September 20, 1988—The Labor-HHS-Education Appropriations Act, 1989, provided $7,152,207,000 for NIH (which included a 1.2 percent across-the-board reduction and a $6.8 million reduction for procurement reform). Of the amount appropriated for NINCDS, up to $96,100,000 was to go to the new National Institute on Deafness and Other Communication Disorders, following enactment of authorizing legislation. The pay rate for NIH nurses and allied health specialists having direct patient care responsibilities was equated to that of nurses at the Veterans Administration. Fifteen million dollars was appropriated to develop specifications and design for a consolidated office building at NIH, $14 million for the new Building 49, and $5 million for renovation of AIDS facilities. In addition, a biotechnology training program was established, as well as human genome and biotechnology panels.

Funds were authorized to support no less than 13,252 FTEs, including an additional 200 for AIDS and 150 for non-AIDS. Funding was also authorized for new magnetic resonance imaging equipment at the cardiac energetic laboratory and for a National Bone Marrow Registry at NHLBI; $8.7 million was earmarked for AIDS clinical trials.

Building 31 was renamed the Claude Denson Pepper Building. (P.L. 100-436.)

September 22, 1988—The Treasury, Postal Service and General Government Appropriations Act, 1989, provided that no Federal agency could receive funds appropriated for FY 1989 unless it had in place a written policy ensuring that its workplaces were free from illegal use, possession, or distribution of controlled substances. This restriction also applied to grant recipients, contractors, and parties to other agreements. (Subsequent legislation required implementation of this law in January 1989.) (P.L . 100-440.)

September 29, 1988—The National Defense Authorization Act, FY 1989, provided a special pay retention bonus for medical officers below grade O-7 who met certain criteria. Although officers of the commissioned corps were not specifically mentioned, 42 U.S.C. 210(a) states that they shall receive special pay received by commissioned medical and dental officers of the Armed Forces. (P.L. 100-456.)

October 4, 1988—P.L. 100-471 amended the PHS act to authorize the secretary, HHS, to make grants to the states to provide drugs determined to prolong the life of individuals suffering from AIDS; $15 million was authorized to be appropriated through March 31, 1989. (Funds appropriated for FY 1989 were transferred from NIH and other PHS agencies to pay for this program, according to transfer authority contained in P.L. 100-436.)

October 28, 1988—The National Deafness and Other Communication Disorders Act of 1988 established that institute at NIH and renamed NINCDS the National Institute of Neurological Disorders and Stroke. The legislation included a program, a data system and information clearinghouse, centers, and an advisory board, as well as a Deafness and Other Communication Disorders Interagency Coordinating Committee, to be chaired by the director of NIH or designee. (P.L. 100-553.)

November 4, 1988—Title I of the Health Omnibus Programs Extension of 1988 (HOPE), the National Institute on Deafness and Other Communication Disorders and Health Research Extension Act of 1988, established the NIDCD and reauthorized expiring programs of NIH for 2 years. Since the new institute had already been established by P.L. 100-553, the provision in this bill is not valid. (P.L. 100-607)

A National Center for Biotechnology Information was established in the National Library of Medicine; the provision for VA pay for nurses and allied health professionals was reiterated; NCI, NHLBI, and NRSA programs were reauthorized; responsibility for the primary care training program was shifted to HRSA; the Interagency Technical Committee was abolished; the Alzheimer's disease provisions of P.L. 99-660 were shifted to the NIA section of the PHS act; the moratorium on fetal research was extended through November 4, 1990; funds were appropriated for the Biomedical Ethics Advisory Board and a report specified; the secretary was directed to consult with the director, NIH, on establishment of a National Commission on Sleep Disorders, which would include among the ex officio members the directors of NINCDS, NHLBI, NIMH, NIA, and NICHD, with a report and a plan required. Finally, the bill extended confidentiality provisions to subjects of all biomedical, behavioral, clinical, or other research, including research on mental health.

Title II, "Programs with Respect to Acquired Immune Deficiency Syndrome," laid the foundation for a Federal policy on AIDS. In addition to provisions for AIDS research, the bill included provisions for information dissemination, education, prevention, anonymous testing, and establishment of a National Commission on AIDS. The review process for AIDS-related grants was expedited, provision was made for priority requests for personnel and administrative support, a clinical research review committee was established within NIAID, the AIDS outpatient capacity at the Clinical Center was doubled, community-based clinical trials were mandated, awards for international clinical research were authorized, research centers were supported, and information services were expanded. An Office of AIDS Research was established within OD. Title VI, the Health Professions Reauthorization Act of 1988, established a loan repayment program for scientists who agree to conduct AIDS research while employed at NIH. (P.L. 100-607.)

November 21, 1989—Departments of Labor, Health and Human Services, and Education, and Related Agencies Appropriations Act, 1990, provided for the purchase of an advanced design supercomputer and named four NIH buildings for members of Congress. (P. L. 101-166)

November 29, 1989—An act to provide for the construction of biomedical facilities in order to ensure a continued supply of specialized strains of mice essential to biomedical research in the United States, and for other purposes, provided authority to make construction grants for this purpose. (P.L. 100-190)

1990

August 18, 1990—Ryan White Comprehensive AIDS Resources Emergency Act of 1990, authorized NIH to make demonstration grants to community health centers and other entities providing primary health care and servicing a significant number of pediatric patients and pregnant women with HIV disease. Awardees were to provide clinical data to NIH for evaluation. (P.L. 101-381)

November 5, 1990—Omnibus Budget Reconciliation Act of Response, Compensation, and Liability Act of 1980 (under which NIEHS operates some programs) and called on the secretary, with NCI, to review periodically the appropriate frequency for performing screening mammography.

Treasury, Postal Service and General Government Appropriations Act, 1991, established the PHS senior biomedical research service. (P.L. 101-509)

Departments of Labor, Health and Human Services, and Education, and Related Agencies Appropriations Act, 1991, provided for the first time, a 1 percent NIH director's transfer authority for high-priority activities and capped the NIH contribution for salaries for individuals receiving extramural funding. (P.L. 101-517)

November 15, 1990—Clean Air Act Amendments of 1990, required NIEHS to conduct a study of mercury exposure; to be available, with NCI, for membership on a panel for the Mickey Leland Urban Air Toxics Research Center and an inter-agency task force on air pollution; and authorized an NIEHS program of basic research on human health risks from air pollutants. (P.L. 101-549)

Home Health Care and Alzheimer's Disease Amendments of 1990, broadened the authority for Alzheimer's disease research centers and authorized Claude D. Pepper Older Americans Independence Centers grants. (P.L. 101-557)

November 16, 1990—The NIH Amendments of 1990, had two purposes: it authorized a nonprofit organization the National Foundation for Biomedical Research (membership amended by P.L. 102-170) and created NICHD's National Center for Medical Rehabilitation Research. (P.L. 101-613)

Hazardous Materials Transportation Uniform Safety Act of 1990, authorized NIEHS to provide grants for the training and education of workers who are or may be engaged in activities related to hazardous waste removal, containment or emergency response. (P.L. 101-615)

Transplant Amendments of 1990, reauthorized and amended the PHS act as it concerns the National Bone Marrow Donor Registry in the NHLBI and called for the establishment of national standards and procedures. (P.L. 101-616)

August 14, 1991—Terry Beirn Community Based AIDS Research Initiative Act of 1991, authorized this initiative in the PHS act and NIAID. (P.L. 102-96)

November 26, 1991—Departments of Labor, Health and Human Services, and Education, and Related Agencies Appropriations Act, 1992, established NCI's Matsunaga-Conte Prostate Cancer Research Center, a women's health study, and provided authority to transfer funds to emergency activities. (P.L. 102-170)

December 9, 1991—The High Performance Computing Act of 1991, authorized Federal agencies such as NIH to allow recipients of research grant funds to pay for computer networking expenses. (P.L. 102-194)

February 4, 1992—The American Technology Preeminence Act of 1991 gave authority to the directors of Federal laboratories (NIH) to give research equipment that is excess to the needs of the laboratory to an educational institution or nonprofit organization for the conduct of technical and scientific education and research activities (P.L. 102-245)

July 10, 1992—The Alcohol, Drug Abuse, and Mental Health (ADAMHA) Reorganization Act, amended by the PHS act to provide for the incorporation of the three ADAMHA research institutes —NIMH, NIAAA, and NIDA—into the NIH as of October 1, 1992. A new PHS act section 409 was added and defined "health services research" as research endeavors that study the impact of organization, financing, and management of health services of the quality, cost, access to and outcomes of care. This is an entirely new programmatic undertaking for NIH and these three new institutes. Of particular interest are provisions that authorize a bypass budget for these three institutes for FY 1994 and 1995. (P.L. 102-321)

October 13, 1992—The DES Education and Research Amendments of 1992, require the director, NIH, to establish a program for the conduct and support of research and training, dissemination of health information, and other programs with respect to the diagnosis and treatment of conditions associated with exposure to DES. (P.L. 102-409)

The Agency for Health Care Policy and Research Reauthorization Act of 1992, requires that the NLM establish an information center on health service research, and on selected technology assessments and clinical practice guidelines produced by AHCPR and other public and private sources. The AHCPR administrator, in consultation with the NLM director, is required to develop and publish criteria for the inclusion of practice guidelines and technology assessments in the information center database. (P.L. 102-410)

October 24, 1992—The Cancer Registries Act requires the establishment of a national program of cancer registries, with the overall goal being the assurance of minimal standards for quality and completeness of (cancer) case information. Provisions also require the DHHS secretary, acting through the NCI director, to conduct a study for the purpose of determining the factors contributing to the fact that breast cancer mortality rates in 9 states and the District of Columbia are elevated compared to rates in the other 43 states. (P.L. 102-515)

The Energy Policy Act of 1992 authorizes electric and magnetic fields research and public information activities by the NIEHS director. (P.L. 102-486)

October 26, 1992—The Preventive Health Amendments of 1992 provide authorities regarding the coordination of Federal programs related to preventable cases of infertility arising as a result of sexually transmitted diseases; also delineates coordination between the director, CDC, and director, NIH. (P.L. 102-531)

October 28, 1992—The Small Business Innovation Research and Development and Enhancement Act of 1992 reauthorizes the SBIR program through September 30, 2000, and increases set aside percentages for each Federal agency with an extramural budget for research and development in excess of $100 million in FY 1992 (1.25 percent) upward to 2.5 percent by 1997 and onward. Legislation also requires enhancement of agency outreach efforts to increase participation of women-owned and socially and economically disadvantaged small business concerns, and tracking of awards to document their participation in the program. (P.L. 102-564)

The Housing and Community Development Act of 1992 requires the secretary, HHS, acting through the director, CDC, and director, NIEHS, to jointly conduct a study of the sources of lead exposure in children who have elevated blood lead levels (or other indicators of elevated lead body burden) as defined by the director, CDC. (P.L. 102-550)

November 4, 1992—The National Aeronautics and Space Administration (NASA) Authorization Act includes provisions offered as an amendment requiring NIH and NASA to jointly establish a working group, with equal representation from NASA and NIH, to coordinate biomedical research activities in areas where microgravity environment may contribute to significant progress in the understanding and treatment of diseases and other medical conditions; establishment of a joint program of biomedical research grants in the above described areas, where such research requires access to a microgravity environment, and annual issuance of joint research opportunity announcements; creation of a joint program of graduate research fellowships in biomedical research; and establishment and submission of a plan for the "conduct of joint biomedical research activities by the republics of the former Soviet Union and the United States." (P.L. 102-588)

June 10, 1993—The NIH Revitalization Act of 1993 reauthorized certain expiring authorities of the NIH; mandated establishment of the Office of Research Integrity in DHHS; lifted the moratorium on human fetal tissue transplantation research; mandated inclusion of women and minorities in clinical research protocols; created in statute the Office of Alternative Medicine, the Office of Research on Women's Health, the Office of Research on Minority Health, the Office of Biobehavioral and Social Sciences Research, and the National Center for Human Genome Research; mandated establishment of an intramural laboratory and clinical research program on obstetrics and gynecology within NICHD and the National Center on Sleep Disorders Research in NHLBI; codified in statute the establishment of the Office of AIDS Research, and strengthened and expanded its authorities, including authorizing OAR receipt of all appropriated AIDS funds for distribution to the ICs; authorized the establishment of an NIH director's discretionary fund; provided the director, NIH, with extramural construction authority; required from extramural construction funds a $5 million set aside for Centers of Excellence; mandated establishment of the IDeA program; required the NCI to conduct the Long Island breast cancer study; authorized establishment of scholarship and loan repayment programs for individuals from disadvantaged backgrounds; changed the designation from center to institute for NINR and from division to center for the Division of Blood Resources, NHLBI; and provided other new NIH authorities and directives. (P.L. 103-43)

August 3, 1993—The Government Performance and Results Act of 1993 seeks to curb fraud waste and mismanagement in the operation of the Federal Government by establishing performance standards. (P.L. 103-62)

December 14, 1993—The Preventive Health Amendments of 1993 required the director, NIAID, to conduct or support research and research training regarding the cause, early detection, prevention and treatment of tuberculosis, and authorized to be appropriated $50 million for FY 1994 and such sums as necessary for FYs 1995-98. (P.L. 103-183)

September 30, 1994—The Department of Labor, HHS, and Education Appropriations Act, 1995, provided for the first time a consolidated appropriation for NIH AIDS research to the Office of AIDS Research. (P.L. 103-333)

October 25, 1994—The Dietary Supplement Health and Education Act of 1993 mandated establishment of an Office of Dietary Supplements within NIH to conduct and coordinate NIH research relating to dietary supplements and the extent to which their use reduces the risk of certain diseases. (P.L. 103-417)

May 22, 1995—The Paperwork Reduction Act of 1995 amends the U.S. Code to reduce by 5 percent the Federal paperwork burdens imposed on individuals, small businesses, state and local governments, education and nonprofit institutions and Federal contractors; also had the effect of establishing in statute the NIH Office of Information Resources Management. (P.L. 104-13)

December 21, 1995—The Federal Reports Elimination and Sunset Act of 1995 provides for improvement of the efficiency of agency operations by reducing staff time and resources spent on producing "unnecessary" reports to Congress. (P.L. 104-66)

November 1, 1995—The Biotechnology Process Patents Protection Act of 1995 strengthens patent protection and clarifies the circumstances under which a patent using biotechnological processes can be issued; allows U.S. researchers to enforce their patents claiming a certain starting material against the unfair importation of products made overseas using such material; and stops international theft of intellectual property; and makes U.S. patent law consistent with that of the Europeans and the Japanese. (P.L. 104-41)

January 26, 1996—The Balanced Budget Downpayment Act I, a continuing resolution, contained an amendment prohibiting the use of NIH funds for human embryo research; and cited NIH's FY 1996 funding in P.L. 104-91, such that the prohibition would continue for the duration of the FY 1996 funding year. (P.L. 104-99)

March 7, 1996—The National Technology Transfer and Advancement act of 1995 amended the Stevenson-Wydler Technology Innovation Act of 1980 with respect to reinvention made under Cooperative Research and Development Agreements; addressed the assignment of intellectual property rights and the use and deregulation of royalty income. (P.L. 104-113)

April 24, 1996—The Antiterrorism and Effective Death Penalty Act of 1996 required that the Secretary, HHS, establish safety procedures for use of biological agents, training in handling and proper laboratory containment, safeguards to prevent their use for criminal purposes, and procedures to protect the public safety. The act provided, however, that the Secretary must ensure availability of biological agents for research purposes. (P.L. 104-132)

May 20, 1996—The Ryan White CARE Reauthorization Act revised and extended authorization of the 1990 act, which provided for care and services for persons living with HIV/AIDS. Title IV provisions require the administrator, HRSA, to consult with the director, NIH, in carrying out a grants program to provide health care and opportunities for women, infants, children, and youth to participate as voluntary subjects of clinical research on HIV disease that is of potential benefit to them. (P.L. 104-146)

July 29, 1996—The Traumatic Brain Injury Act amended the PHS Act to provide for the conduct of expanded studies and establishment of innovative programs with respect to traumatic brain injury. The act authorizes the Secretary, acting through the director, NIH, to award grants or contracts for the conduct of basic and applied research regarding traumatic brain injury. (P.L. 104-166)

August 6, 1996—The Safe Drinking Water Act amendments reauthorized the Safe Drinking Water Act, toughened standards and required the Environmental Protection Agency to consult with NIH and the CDC in announcing an interim national primary drinking water regulation for a contaminant in the case of an urgent threat to public health. (P.L. 104-182)

October 2, 1996—The Electronic Freedom of Information Act established the right of the public to obtain access to Agency records, including electronically stored documents, and requires Federal agencies to make available certain Agency information to the public for inspection and copying. (P.L. 104-231)

October 18, 1996—The General Accounting Office Management Reform Act amended the PHS Act to limit the amount NIH may obligate for administrative expenses each fiscal year and repealed a requirement that the U.S. Comptroller General conduct, audit, and report to the Congress regarding the National Foundation for Biomedical Research. (P.L. 104-316)

September 30, 1996—The FY 1997 Labor, HHS, and Education Appropriations Act continued the prohibition on use of NIH funds for human embryo research. The act provided for construction of the new Mark O. Hatfield Clinical Research Center. (P.L. 104-208)

J**uly 3, 1997**—Section 2118 of the Energy Policy Act of 1992 was amended to extend the Electric and Magnetic Fields Research and Public Information Dissemination Program, a joint U.S. Department of Energy and NIEHS venture, for 1 year. (P.L. 105-23)

August 5, 1997—The Balanced Budget Act authorized a $150 million increase for research on the prevention and care of type-1 diabetes. (P.L.105-33)

November 21, 1997—The Food and Drug Administration Regulatory Modernization Act of 1997 directed NIH, in coordination with the CDC, to develop and maintain a database and information service that provides centralized information on research, treatment, detection, and prevention activities related to serious or life-threatening diseases. The act also directed NIH, the FDA, and medical and scientific societies to identify published and unpublished studies by clinicians and researchers that may support a supplemental application for a licensed product and to encourage manufacturers to submit a supplemental application or to conduct further research to support a supplemental application. (P.L. 105-115)

December 2, 1997—The Small Business Reauthorization Act, reauthorized the Small Business Technology Transfer (STTR) program for 4 years and required that the STTR program information be submitted as a part of Federal agency performance plans and be made available to the Congress. (P.L. 105-135)

December 17, 1997—The Federal Advisory Committee Act Amendment included provisions that permit the public to attend taxpayer-funded advisory committee meetings and receive minutes and other documents prepared for or by such committees. (P.L. 105-153)

June 23, 1998—The Agricultural Research, Extension, and Education Reform Act of 1998 required the Secretary, U.S. Department of Agriculture, to establish a Food Safety Research Information Office whose activities are carried out in cooperation with the NIH, the FDA, CDC, and public and private institutions. (P.L. 105-185)

July 16, 1998—The National Marrow Donor Program was reauthorized. (P.L. 105-196)

August 7, 1998—The Workforce Investment Partnership Act of 1997 is omnibus legislation that created in statute an Interagency Committee on Disability Research whose membership includes the directors of NIH and NIMH. (P.L. 105-220)

October 9, 1998—The Mammography Quality Standards Reauthorization Act reauthorized through FY 2002 such sums as may be necessary for the award of grants for breast cancer screening surveillance research. (P.L. 105-248)

October 19, 1998—The Federal Employees Health Care Protection Act of 1998 contained a provision to raise the cap from $20,000 to $30,000 for the Physician's Comparability Allowance (PCA). The PCA is subject to "applicable limitations," including aggregate compensation limitation. (P.L. 105-266)

October 21, 1998—The Appropriations for the Department of Veterans Affairs and Housing and Urban Development for FY 1999 provided appropriations for the NIEHS Superfund Worker Training Program and for the NIEHS Superfund Research Program. (P.L. 105-276)

October 21, 1998—FY 1999 Treasury and General Government Appropriations prohibited interagency financing of commissions, councils, committees, or similar groups. Section 622 prohibited Federal agencies from purchasing information technology that is not Year 2000 compliant unless the agency's chief information officer determines that noncompliance would be necessary to the function and operation of the agency.

October 21, 1998—The Omnibus Consolidated and Emergency Supplemental Appropriations Act, 1999, created in statute at NIH the National Center for Complementary and Alternative Medicine; renamed the NIDR as the National Institute of Dental and Craniofacial Research; and named two new NIH buildings after retiring members of Congress: 1) the Louis Stokes Laboratories and 2) the Dale and Betty Bumpers Vaccine Research Facility.

The act continued human embryo research prohibition, the NIH director's transfer authorities, and third-party payment authority for the NIH Clinical Center. In addition, permanent authority was provided to NIH for transit subsidies for non-full-time equivalent bearing positions, including visiting fellows, trainees, and volunteers. General provisions were provided for prohibition on the use of funds for programs for sterile needle distribution; and a prohibition on the use of funds for promoting legalization of controlled substances, except where there is evidence of therapeutic advantage or that federally sponsored clinical trials are being conducted to determine advantage.

This act authorized NICHD to be represented on a peer review panel established by the Secretary of Education to review applications from the states for scientifically based reading research activities.

Provisions included amendment of OMB Circular A-110, requiring Federal funding agencies to ensure that all data produced under an award will be made available to the public through the procedures established under the Freedom of Information Act.

The director of the Office of National Drug Control Policy was directed to consult with the directors of appropriate NIH institutes to establish criteria for evaluation of substance abuse treatment and prevention programs.

The conference report included the following:

- Directive language for the NCI on prostate cancer research.
- The NIDDK and other ICs were urged to expand funding for juvenile diabetes.
- The NIEHS and ORMH would enhance support for environmental health effects/minority health centers; NIEHS is to work with NIOSH on the national occupational research agenda (NORA).
- NIA is to launch a full-scale prevention initiative for Alzheimer's disease and is to work with NIOSH on NORA.
- The NIAMS is to expand research on Osteogenesis Imperfecta.
- The Office of Rare Diseases is to develop an information program on biological samples and human cell and tissue banks available for research purposes.
- The Office of Behavioral and Social Sciences Research is urged to establish two to five mind/body centers.
- NIH is to focus resources on the cause and treatment for Parkinson's disease.
- NIH is to enhance research on Multiple Sclerosis and other autoimmune disorders. (P.L. 105-78)

October 28, 1998—The Next Generation Internet Research Act of 1998 amended the High-Performance Computing Act of 1991 to authorize Government-funded research into high-capacity, high-speed computer networks. (P.L. 105-305)

October 31, 1998—The Women's Health Research and Prevention Amendments of 1998 extended and/or amended various NIH authorities related to women's health research, including: the drug DES (diethylstilbestrol); osteoporosis, Paget's disease and related disorders; breast, ovarian and related cancers; heart attack, stroke, and other cardiovascular diseases; aging processes; and the Office of Research on Women's Health. (P.L. 105-340)

November 10, 1998—The Federal Reports Elimination Act of 1998 provided for the elimination of the following reports of particular interest to NIH: Report of the Council on Alzheimer's Disease; Report on the U.S.-Japan Cooperative Medical Science Program; Report of the Interagency Coordinating Committee on Arthritis and Musculoskeletal and Skin Diseases; Report on Family Planning and Population Research; Report of the NICHD Associate Director for Prevention; Report on Health Services Research; Annual Reports of the National Diabetes Advisory Board, National Digestive Diseases Advisory Board, and National Kidney and Urologic Diseases Advisory Board; Public Health Service Report; Annual Report on Disease Prevention; and Annual Report on Administrative Expenses. (P.L. 105-362)

November 13, 1998—The Health Professions Education Partnership Act reauthorized and consolidated health professions, nursing, and minority and disadvantaged health education programs within the Department of Health and Human Services. The act provided additional research training and Title 38 appointment authorities for the NIH director; reauthorized the NIH AIDS loan repayment program (LRP); and increased the maximum annual loan repayment from $20,000 to $35,000 for this and other NIH LRPs; authorized tax relief benefits for participants in the NIH Clinical Researchers from Disadvantaged Backgrounds LRP; and made discretionary the National Center for Research Resources director's authority for construction awards to the regional primate research centers and reduced the amount that may be reserved from $5.0 million to $2.5 million. (P.L. 105-392)

November 20, 1999—Federal Financial Assistance Management Improvement Act of 1999 required agencies to develop plans to streamline grant administration activities. OMB was directed to 1) develop a common application, or set of common applications, for applying for Federal assistance; 2) develop a common system, including electronic processes, for grant administration activities; and 3) develop uniform administrative rules for Federal financial assistance programs across different agencies. (P.L. 106-107)

November 29, 1999—Omnibus Appropriations for NIH, Fiscal Year 2000, provided NIH with an increase of $2.3 billion over FY 1999. This legislation also included the Newborn and Infant Screening and Intervention Act which directed the National Institute on Deafness and Other Communication Disorders (NIDCD) to carry out a program of research on the efficacy of new screening techniques and technology, including clinical trials of screening methods, studies on the efficacy of intervention, and related basic and applied research on hearing loss in newborns. (P.L. 106-113)

December 6, 1999—Healthcare Research and Quality Act reauthorized and renamed the Agency for Health Care Policy and Research as the Agency for Healthcare Research and Quality (AHRQ). Provisions required the AHRQ Director, to promote innovation in evidence-based clinical practice and healthcare technologies to consult with the NIH Director and work with the National Library of Medicine to develop an electronic clearinghouse of currently available assessments and those in progress. The NIH Director will serve on the AHRQ Advisory Council as an ex oficio member. (P.L. 106-129)

2000

June 30, 2000—The Electronic Signatures in Global and National Commerce Act mandated that electronic contracts with electronic signatures have the same legal force as paper contracts. (P.L. 106-229).

July 10, 2000—The Radiation Exposure Compensation Act (RECA) Amendments of 2000 amended the Public Health Service Act to establish a grant program to States for education, prevention, and early detection of radiogenic cancers and diseases. Entities eligible to receive such grants include National Cancer Institute-designated cancer centers. The competitive grants would be made by the Secretary of Health and Human Services, acting through the Administrator of the Health Resources and Services Administration, in consultation with the Directors of the National Institutes of Health and Indian Health Service. (P.L. 106-245)

July 13, 2000—The Emergency Supplemental Act, Fiscal Year 2000, repealed Section 216 of P.L. 106-113, the Omnibus Consolidated Appropriations Act, which funded the NIH for fiscal year (FY) 2000. Section 216 of that Act specified that $3 billion of the funds appropriated for NIH were not available for obligation until September 29, 2000, and would not be available for obligation until October 15, 2000. This provision was repealed, thus releasing the funds for use prior to September 29, 2000. (P.L. 106-246)

July 28, 2000—The Semipostal Authorization Act amended the Postal Service Reorganization Act to extend the authority to issue semipostal stamps for breast cancer research until July 29, 2002. Seventy percent of the profits of this stamp go to the NIH to fund breast cancer research and thirty percent go to the U.S. Department of Defense for its breast cancer research program. Appropriations to NIH was not affected by any proceeds received from the sale of semipostal stamps.

(P.L. 106-253)

October 17, 2000—The Children's Health Act of 2000 authorized Federal programs for research and other activities related to autism, Fragile X, juvenile arthritis, juvenile diabetes, asthma, hearing loss, epilepsy, traumatic brain injuries, childhood skeletal malignancies, muscular dystrophy, autoimmune diseases, birth defects and genetic mental impairment, among other conditions. The bill also required an NIH pediatric research initiative within the Office of the Director, NIH, with provisions addressing loan repayment for pediatric researchers and pediatric research human subject protections. (P.L. 106-310)

October 17, 2000—The American Competitiveness in the 21st Century Act of 2000 increased the cap on the number of H1-B visas from 115,000 to 195,000 each year for the next 3 years. The legislation eliminated the cap on H1-B visas for government, academic, non-profit and affiliated workers. (P.L. 106-313)

October 20, 2000—The Ryan White CARE Act Amendments of 2000 provisions required an NIH review of the distribution and availability of ongoing and appropriate HIV/AIDS research projects to existing Ryan White sites for the purpose of enhancing and expanding voluntary access to HIV-related research, particularly in communities underserved by such projects. In addition, the NIH is required to conduct research on development of rapid diagnostic test kits. (P.L. 106-345)

November 1, 2000—The Technology Transfer Commercialization Act of 1999 is intended to "improve the ability of Federal agencies to license Federally-owned inventions." (P.L. 106-404)

November 6, 2000—The Needlestick Safety and Prevention Act required changes in the blood-borne pathogens standards in effect under the Occupational Safety and Health Act of 1970 to protect workers whose occupations expose them to pathogens such as HIV. Employers are required to use needles and other medical devices that have built-in safety mechanisms to reduce accidental punctures and to keep a log of needlestick injuries that would protect confidentiality of injured employees. (P.L. 106-430)

November 13, 2000—The Older Americans Act of 2000 required a White House Conference on Aging to be convened no later than December 31, 2005, to make fundamental policy recommendations regarding programs that are important to older individuals, and to the families and communities of such individuals. The Conference is to be planned and conducted under the direction of the Secretary, in cooperation with other federal agencies, including the Director of the National Institute on Aging. H.R. 782 will now proceed to the Senate for consideration. The legislation reauthorizes and amends the Older American's Act of 1965 and the Older Americans Act Amendments of 1987. (P.L. 106-501)

November 13, 2000—The Public Health Improvement Act of 2000 is a compilation of bills which amended the Public Health Service Act and provided new authorities to NIH and other Public Health Service agencies, or placed in statute ongoing activities or programs. This law provided the following: 1) established in statute the National Center for Research Resources (NCRR's) general clinical research centers, the NIH Career Awards in Patient-Oriented Research, which include the Mentored Patient-Oriented Research Career Development Award (K23), the Mid-Career Investigator Award in Patient-Oriented Research (K24), and the Clinical Research Curriculum Award (K30); 2) required the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) to expand and intensify research and related activities regarding lupus; 3) substantially increased the authorization for NIH extramural facilities construction and authorized $100 million to allow the continued operation of NCRR's Shared Instrumentation Grant Program; 4) established in statute an extramural clinical loan repayment program for qualified health professionals who agree to conduct clinical research; 5) created in statute the Alzheimer's Disease Clinical Research and Training program within the National Institute on Aging (NIA); 6) extended the current authority to conduct basic and clinical research in combating prostate cancer research at the National Cancer Institute; 7) directed NIH to evaluate the effectiveness of screening strategies; and 8) included a technical amendment to the Children's Health Act of 2000 (Public Law 106-310) which corrects an inaccurate citation to a provision in the Code of Federal Regulations. (P.L. 106-505)

November 22, 2000—The Minority Health and Health Disparities Research and Education Act of 2000 created in statute a National Center on Minority Health and Health Disparities at the NIH to coordinate: 1) health disparities research performed or supported by NIH, 2) a grant program through the new Center to further biomedical and behavioral research education and training, 3) an endowment program to facilitate minority and other health disparities research at centers of excellence, and 4) a loan repayment program to train members of minority or other health disparities populations as biomedical research professionals. (P.L. 106-525)

December 19, 2000—The Interagency Coordinating Committee on the Validation of Alternative Methods (ICCVAM) Authorization Act of 2000 codifies the existing ICCVAM as a permanent standing committee to be administered by the National Institute on Environmental Health Sciences. The statute requires the ICCVAM to establish, wherever feasible, guidelines, recommendations, and regulations that promote the regulatory acceptance of new or revised scientifically valid toxicological tests that protect human and animal health and the environment while reducing animal tests and ensuring human safety and product effectiveness. (P.L. 106-545)

December 20, 2000—The Chimpanzee Health Improvement, Maintenance, and Protection Act requires NIH to enter into a contract with a nonprofit private entity for the purpose of operating a sanctuary system for the long-term care of chimpanzees that are no longer needed in research conducted or supported by the NIH, the Food and Drug Administration, and other Federal agencies. The law provides for standards for permanent retirement of chimpanzees into the system, including prohibiting using sanctuary chimpanzees for research except in specified circumstances. (P.L. 106-551)

December 21, 2000—The Consolidated Appropriations Act, 2001, provides funding for the U.S. Departments of Labor, Health and Human Services (HHS) and Education; the legislative branch; and the Treasury and Postal Service, and H.R. 5667, the Small Business Reauthorization Act. For the NIH this law provides an appropriation of a $2.523 billion, or 14 percent increase over fiscal year 2000. Specific provisions of the law: 1) provides $47.3 million within Buildings and Facilities for the National Neuroscience Research Center, to be named the John Edward Porter Neurosciences Research Center; 2) permits the Director of NIH to enter into and administer a longterm lease for facilities for the purpose of providing laboratory, office and other space for biomedical and behavioral research at the Bayview Campus in Baltimore, Maryland; 3) expands the intramural loan repayment program for clinical researchers from disadvantaged backgrounds to the extramural community; and 4) raises the salary cap for extramural investigators to Executive Level I from Level II. (P.L. 106-554)

December 28, 2000—The Federal Physicians Comparability Allowance Amendments of 2000 makes physician comparability allowances a permanent authority and requires the allowances to be treated as part of basic pay for retirement purposes. (P.L. 106-571)

December 29, 2000—The National Institute of Biomedical Imaging and Bioengineering Establishment Act amends the Public Health Service Act to create at NIH the National Institute of Biomedical Imaging and Bioengineering. The statute authorizes an amount equal to (plus inflation) the amount currently spent by NIH Institutes for imaging and engineering programs. In establishing the Institute, the Director of NIH is authorized to transfer personnel, use appropriate facilities to house the new Institute, and obtain administrative support from other agencies of NIH. The Institute is required to have a 12-member advisory council, and prepare a plan to address the consolidation and coordination of NIH biomedical imaging and engineering programs, as well as related activities of other Federal agencies. (P.L. 106-580)

May 24, 2001—The Animal Disease Risk Assessment, Prevention and Control Act of 2001 mandates that the Secretary of Agriculture submit a final report to Congress on plans by Federal agencies (including the National Institutes of Health and the Agriculture Research Service and Cooperative State Research, Education, and Extension Service of the U.S. Department of Agriculture) to carry out in partnership with the private sector 1) research programs into the causes and mechanisms of transmission of foot and mouth disease and bovine spongiform encephalopathy (BSE), variant Creutzfeldt-Jacob disease, and related disease, and 2) diagnostic tools and preventive and therapeutic agents needed for foot and mouth disease, BSE, variant Creutzfeldt-Jacob disease, and related diseases. In addition, this legislation mandates that the final report to Congress contain plans by Federal agencies (including the Centers for Disease Control and Prevention) 1) to monitor the incidence and prevalence of the transmission of foot and mouth disease, BSE, variant Creutzfeldt-Jacob disease, and related diseases in the United States; and 2) to assess the effectiveness of efforts to prevent and control the spread of foot and mouth disease, BSE, variant Creutzfeldt-Jacob disease, and related diseases in the United States. (P.L. 107-9)

July 24, 2001—The 2001 Supplemental Appropriations Act included 1) provisions to permit the transfer of funds from the National Library of Medicine (NLM) to the National Institutes of Health (NIH) Buildings and Facilities account to complete the design phase of a new NLM facility, 2) report language to permit the new National Institute of Biomedical Imaging and Bioengineering (NIBIB) to use funds appropriated to the NIH Office of the Director (OD) for start up of the new Institute, and 3) language directing that information requested from the Committee on Appropriations was to be transmitted "uncensored and without delay." (P.L. 107-20)

October 26, 2001—The Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism (PATRIOT) Act of 2001 amends a number of titles of the United States Code in an effort to expand the Nation's ability to intercept and thwart terrorist threats. Of particular interest are amendments to Title 18 regarding possession, use, and transport of biological agents. These amendments seek to ensure that only those persons who have a lawful purpose for possessing, using, and/or transporting such agents are permitted to work with these agents, and that penalties are established for certain "restricted" individuals who are in possession of such agents. The Act also enhances the powers of the Attorney General, law enforcement officials, and the courts regarding wire, oral, and electronic communications. (P.L. 107-56)

December 18, 2001—The Muscular Dystrophy Community Assistance Research and Education Amendments of 2001 (MD-CARE Act) amends the Public Health Service Act. Of particular interest to NIH this legislation mandates that the Director of the National Institutes of Health, in coordination with the Directors of the National Institute of Neurological Disorders and Stroke, National Institute of Arthritis and Musculoskeletal and Skin Diseases, National Institute of Child Health and Human Development, and other national research institutes, as appropriate, expand and intensify programs with respect to research and related activities concerning Duchenne, myotonic, facioscapulohumeral, and other forms of muscular dystrophy (MD). In addition, the legislation 1) requires the establishment of Muscular Dystrophy Centers of Excellence, 2) requires the Secretary of Health and Human Services (HHS) to contract with the Institute of Medicine to study centers at NIH and make recommendations when their establishment is appropriate, 3) creates a Muscular Dystrophy Interagency Coordinating Committee that is required to develop a plan for conducting and supporting research and education on MD through the national research institutes and submits a biennial report to Congress describing research activities; 4) establishes a program in which samples of tissues and genetic materials that are of use in research on MD are donated, collected, preserved, and made available for such research; 5) requires the Secretary of HHS to provide a means of public input on existing and planned MD research activities; 6) requires the Centers for Disease Control and Prevention to carry out activities with respect to Duchenne MD epidemiology. (P.L. 107-84)

January 4, 2002—The Best Pharmaceuticals for Children Act reauthorizes the pediatric studies provision of the Food and Drug Administration Modernization and Accountability Act of 1997 to improve the safety and efficacy of pharmaceuticals for children. It continues to encourage pharmaceutical companies to conduct pediatric studies of on-patent drugs that are used in pediatric populations, but are not labeled for such use, by extending their market exclusivity. In addition, this legislation authorizes studies for "off-patent" drugs by the Federal Government or other entities with the expertise to conduct pediatric clinical trials. (P.L. 107-109)

January 10, 2002—The Department of Defense Appropriations Act, 2002 provides funding for NIH for bioterrorism under the Emergency Supplemental Act, 2002 (which is part of this legislation). The "conferees encourage the National Institute of Allergy and Infectious Diseases (NIAID) to conduct research on safer alternatives to the existing smallpox vaccine, such as an inactivated smallpox virus." In addition, funds are provided for the construction of a level-4 biosafety laboratory and related infrastructure costs at NIAID and for improving laboratory security at CDC and NIH. The bill also includes funds for the National Institute of Environmental Health Sciences (NIEHS) "for carrying out under current authorities, worker training, research, and education activities" in response to the September 11 terrorist attacks. (P.L. 107-117)

May 14, 2002—The Hematological Cancer Research Investment and Education Act, amends the Public Health Service Act to require 1) the Director of the National Institutes of Health, through the National Cancer Institute, to expand and coordinate blood cancer research programs, particularly with respect to leukemia, lymphoma, and multiple myeloma (the Joe Moakley Research Excellence Program); and 2) the Secretary of Health and Human Services to establish a related education program for patients and the general public (the Geraldine Ferraro Cancer Education Program). (P.L. 107-172)

June 12, 2002—The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 amends Section 319 of the Public Health Service Act to strengthen protections related to public health. The Act requires the Secretary of Health and Human Services (HHS), in coordination with appropriate Federal department and agency officials, to establish a joint interdepartmental working group on preparedness for acts of bioterrorism. Among its activities, this group is charged with providing consultations on, assistance in, and recommendations regarding provision of appropriate safety and health training; coordination and prioritization of countermeasures to treat, prevent, or identify exposures to biological agents; and research on pathogens likely to be used in a biological threat or attack on the civilian population. (P.L. 107-188)

August 2, 2002—The Supplemental Appropriations for FY 2002 bill names in statute the National Research Service Awards (NRSA) the Ruth L. Kirschstein National Research Service Awards. (P.L. 107-206)

October 26, 2002—The Medical Device User Fee and Modernization Act of 2002 amends Section 215 of the Public Health Service Act to authorize the Director of NIH to conduct or support research to examine the long-term health implications of gel and saline-filled breast implants. This authorization includes studies to 1) develop and examine techniques to measure concentrations of silicone in body fluids and tissues, and 2) track silicone breast implant recipients. Within 6 months of enactment, the Director of NIH is required to submit a report to Congress describing the status of research on breast implants being conducted or supported by the Agency. (P.L. 107-250)

October 26, 2002—The Health Care Safety Net Amendments, repeals the requirement for the Health Resources and Services Administration loan repayment program (LRP) reporting requirements, which also repeals the National Institutes of Health LRP reporting requirements, which were mandated under the National Health Service (NHS) authorities. Specifically, this repeals Section 338B(i) of the Public Health Service Act, which required an annual report to Congress on the NHS Corps Loan Repayment Program. (P.L. 107-251)

November 2, 2002—The 21st Century Department of Justice Appropriations Authorization Act contains a provision that amends Section 464N of the Public Health Service Act addressing drug abuse and addiction research. The law provides that the Director of NIDA may make grants or enter into cooperative agreements to expand the current and ongoing interdisciplinary research and clinical trials with treatment centers of the National Drug Abuse Treatment Clinical Trials Network that relate to drug abuse and addiction, including related biomedical, behavioral, and social issues. The law mandates that the Director of NIDA shall promptly disseminate research results to Federal, State, and local entities involved in combating drug abuse and addiction. The law also requires NIDA to conduct a study of methamphetamine treatment. (P.L. 107-273)

November 6, 2002—The Rare Diseases Act provides statutory authorization for the existing NIH Office of Rare Diseases (ORD). The measure requires the Director of the Office of Rare Diseases to recommend an agenda for research on rare diseases, promote coordination and cooperation among NIH Institutes and Centers, promote sufficient allocation of NIH resources related to rare diseases, promote the establishment of a centralized rare diseases information clearinghouse, prepare a biennial report of rare disease research activities and opportunities, prepare the annual report of the Director of NIH to Congress on rare disease research, and serve as the principal advisor on orphan diseases to the Director of NIH. In addition, the legislation establishes regional Centers of Excellence on Rare Diseases. (P.L. 107-280)

November 25, 2002—The Homeland Security Act of 2002 establishes a new Executive Branch agency known as the U.S. Department of Homeland Security (DHS). Among its research provisions, the Act: 1) establishes within DHS a Directorate of Science and Technology, to conduct basic and applied research, development, demonstration, testing, and evaluation activities that are relevant to any or all elements of DHS with the exception of human health-related research and development activities; 2) requires the Secretary of HHS to set priorities, goals, objectives, and policies and to develop a coordinated strategy for these activities in collaboration with the Secretary of Homeland Security; and 3) authorizes the Secretary of Homeland Security to draw upon the expertise of any Federally-supported laboratory, and to establish a headquarters laboratory and additional laboratory units for the Department at any laboratory or site. The Act also includes provisions regarding Federal agency information security protections; acquisitions and procurement improvements; permanent extension, revision, and expansion of authorities for use of voluntary separation incentive pay and voluntary early retirement; and other authorities relevant to human resources management. (P.L. 107-296)

December 18, 2002—The Public Health Service Amendment on Diabetes amends Section 319 of the Public Health Service Act to renew funding for the special diabetes programs for Type 1 diabetes research, and also the parallel services program for diabetes in Native Americans, at $150 million for each of the FYs 2004 through 2008. This measure provides additional funding separate from the regular appropriations process for the special diabetes programs for Type 1 diabetes research at NIH. (P.L. 107-360)

May 27, 2003—The United States Leadership Against HIV/AIDS, Tuberculosis, and Malaria Act of 2003 has the following provisions: 1) requires the President to establish a comprehensive, integrated 5-year strategy to combat global HIV/AIDS, including specific objectives, approaches and strategies; 2) assigns priorities for relevant executive branch agencies; 3) improves coordination among such agencies; and 4) projects general levels of resources needed to achieve the stated goals. This legislation also requires the President to establish a position of HIV/AIDS Response Coordinator at the U.S. Department of State, who would have primary responsibility for oversight and coordination of all U.S. international activities to combat the HIV/AIDS pandemic. (P.L. 108-25)

August 15, 2003—The Mosquito Abatement for Safety and Health Act authorizes grants through the Centers for Disease Control and Prevention for mosquito control programs to prevent mosquito-borne diseases. This legislation requires the Director of the National Institute of Environmental Health Sciences to conduct or support research on methods of controlling the population of insects and vermin that transmit dangerous, diseases to humans. (P.L. 108-75)

December 8, 2003 —The Medicare Prescription Drug, Improvement, and Modernization Act of 2003 requires NIDDK to conduct a clinical investigation of pancreatic islet cell transplantation. (P.L. 108-173)

January 23, 2004 —The Omnibus Appropriations for FY 2004, contains the following two provisions: 1) provides flexible research authority for the NIH Director to enter into transactions (other than contracts, cooperative agreements, or grants) to carry out research in support of the NIH Roadmap Initiative of the Director on a pilot basis; and 2) designates the NIH Muscular Dystrophy Centers as the Senator Paul D. Wellstone Muscular Dystrophy Cooperative Research Centers. (P.L. 108-199)

July 21, 2004 —The Project Bioshield Act of 2004 authorizes NIAID to award grants or contracts to public and nonprofit private entities to expand, remodel, renovate, or alter existing research facilities or construct new research facilities. (P.L. 108-276)

August 2, 2004—The Minor Use and Minor Species Animal Health Act of 2004 requires NIH to convene an ad hoc panel of nationally known experts in the fields of allergy and immunology to review current basic and clinical research activities related to food allergies. The panel is to make recommendations to the Secretary regarding the enhancement and coordination of food allergies research not later than 1 year after the date of enactment of the Act. (P.L. 108-282)

October 25, 2004—The Pancreatic Islet Cell Transplantation Act of 2004 requires the Diabetes Mellitus Interagency Coordinating Committee to include in its annual report an assessment of the Federal activities and programs related to pancreatic islet cell transplantation, which shall address: 1) the adequacy of funding; 2) policies and regulations affecting the supply of pancreata; 3) the effect of xenotransplantation; 4) the effect of the United Network for Organ Sharing policies; 5) the existing mechanisms to collect and coordinate outcome data from trials; 6) implementation of multi-agency clinical investigations; and 7) recommendations for legislation and administrative actions to increase the supply of pancreata. (P.L. 108-362)

November 30, 2004—The Research Review Act of 2004 requires the NIH to submit an NIH Roadmap for Medical Research progress report to Congress no later than February 1, 2005. The bill also incorporated a component of an earlier bill, the Christopher Reeve Paralysis Act, requiring NIH to prepare a report describing NIH Roadmap efforts with respect to spinal cord injury and paralysis research. (P.L. 108-427)

December 8, 2004—The Consolidated Appropriations Act, 2005, provided that "The Center for Biodefense and Emerging Infectious Diseases (Building 33) at the National Institutes of Health is hereby named the C.W. Bill Young Center for Biodefense and Emerging Infectious Diseases." (P.L. 108-447)

November 11, 2005—The Breast Cancer Research Stamp Reauthorization Act reauthorized the issuance of semipostal stamps for breast cancer research, from which NIH receives seventy percent of the profits and the Department of Defense receives 30 percent for their respective breast cancer research activities. These funds are in addition to annual appropriations received. (P.L. 109-100)

December 5, 2005—The Departments of Labor, Health and Human Services, and Education, and Related Agencies Appropriations Act, 2006, provided new language permitting the Office of AIDS Research to use its funding in this Act to make grants for the construction or renovation of facilities in order to expand a breeding colony that will serve as a new national resource to breed nonhuman primates for AIDS research; and a general provision stating that "None of the funds made available in this Act may be used to request that a candidate for appointment to a Federal scientific advisory committee disclose the political affiliation or voting history of the candidate or the position that the candidate holds with respect to political issues not directly related to and necessary for the work of the committee involved." These provisions carry a time limitation relevant to FY 2006 activities only. (P.L. 109-149)

December 19, 2006—The Combating Autism Act of 2006 requires the Director of the National Institutes of Health (NIH) to expand, intensify, and coordinate autism spectrum disorders (ASD)-related research. Specifically, the Act sets forth a nonexhaustive list of research areas to be included in NIH's ASD initiatives, including research into possible environmental causes of autism. It expands the scope of autism research under NIH and the Centers of Excellence in such research to address the entire scope of ASD, rather than only autism. The new law also authorizes the Director to consolidate program activities to improve efficiencies and outcomes. (P.L. 109-416)

December 20, 2006—The Sober Truth on Preventing Underage Drinking Act requires the Secretary of Health and Human Services to formally establish and enhance the efforts of the interagency coordinating committee that began operating in 2004, focusing on underage drinking. The Director of the National Institute on Alcohol Abuse and Alcoholism, and such other Federal officials as the Secretary of Health and Human Services determines to be appropriate will serve as members of this interagency coordinating committee. (P.L. 109-422)

January 15, 2007—The NIH Reform Act revises Title IV of the PHS Act and creates the Division of Program Coordination, Planning, and Strategic Initiatives, to be supported by a Common Fund. There is no growth formula for the Fund and a review is required when the Fund reaches five percent of the total NIH budget. In addition, provisions establish a Council of Councils to advise on research proposals that would be funded by the Common Fund; establish a Scientific Management Review Board (SMRB) to conduct periodic organizational reviews of NIH every seven years, and make recommendations on the use of NIH organizational authorities; and require a public process for reorganizing NIH programs. Provisions authorize (but do not appropriate) for NIH $30,331,309,000 for FY 2007, $32,831,309,000 for FY 2008 and such sums as may be necessary for FY 2009. Provisions also authorize the NIH Director to award grants for demonstration projects for research bridging the biological sciences with the physical, chemical, mathematical, and computational sciences; and authorize the establishment of demonstration programs that award grants, contracts, or engage in other transactions, for high-impact, cutting-edge research demonstration programs. (P.L. 109-482)

May 25, 2007—Supplemental Appropriations for FY 2007 (Rescission for NIH) transferred a total of $99 million from the FY 2007 NIH appropriation to the Assistant Secretary for Preparedness and Response for advanced development of medical biodefense countermeasures. This work is to be conducted by the Assistant Secretary, consistent with the authority provided in the “Pandemic and All-Hazards Preparedness Act.” The transfer consists of $49.5 million from NIAID and $49.5 million from the NIH Office of the Director. (P.L. 110-28)

September 27, 2007—The Food and Drug Administration Amendments Act of 2007, although primarily affecting authorities of the FDA, requires (1) NIH to identify a point of contact to help innovators and physicians identify sources of funding for the development of such devices; (2) the HHS Secretary, acting through FDA and NIH, to create a research plan to expand research on pediatric medical devices; (3) NIH to develop a list of those areas of medicine that require additional testing involving children; (4) NIH to conduct pediatric studies in cases in which a drug is no longer under patent or the manufacturer of a patented drug has declined to conduct a requested study and other funds are not available; and (5) NIH to expand ClinicalTrials.gov to include information on a broader scope of trials and ultimately to include certain information regarding the results of those trials. (P.L. 110-85)

December 13, 2007—The Breast Cancer Research Stamp Reauthorization Act reauthorizes the Breast Cancer Research stamp through December 31, 2011, and requires an annual report to Congress describing how the funds generated by the stamp are used. (P.L. 110-150)

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December 26, 2007—The Consolidated Appropriations Act of 2008 provides in Division D $29.456 billion for NIH; this includes $150 million for Type 1 diabetes. The Act includes a transfer of $295 million within NIH for the Global AIDS Fund; $111 million for the National Children’s Study; $504,420,000 for the Common Fund; $96,030,090 for research on chemical, radiological and nuclear countermeasures; $10,000,000 for the Director's Discretionary Fund; and $25,000,000 for the flexible research authority. (P.L. 110-161)

December 29, 2007—The Medicare, Medicaid, and SCHIP Extension Act of 2007 includes a provision that amends Section 319 of the PHS Act to extend the funding for the special program for Type 1 diabetes at the current funding level of $150 million through FY 2011. This program, which was set to expire in FY 2008, provides additional funding for the special program for Type 1 diabetes research at NIH that is separate from the regular appropriations process. (P.L. 110-173)

April 28, 2008—Traumatic Brain Injury (TBI) Act of 2008 authorizes (1) funding for trauma-related research, treatment, surveillance, and education activities by CDC, HRSA, and NIH trauma research program and provided authorizations for FYs 2009–2012; (2) requires that CDC and NIH report to the relevant congressional committees on activities and procedures that can be implemented by CDC, the U.S. Department of Defense, and the U.S. Department of Veterans Affairs to improve the collection and dissemination of compatible epidemiological studies on the incidence and prevalence of TBI in the military and veterans populations. (P.L.

110-206)

June 30, 2008—The Supplemental Appropriations Act, 2008, provides $150 million for the NIH, which shall be transferred to its Institutes and Centers and to the Common Fund established under section 402A(c)(1) of the PHS Act in proportion to the appropriations otherwise made to such Institutes, Centers, and Common Fund for FY 2008; provisions also set forth the conditions under which these funds may be utilized. Although specific to the Department of Defense, provisions include $75,000,000 appropriated to the "Defense Health Program" for operation and maintenance for psychological health and TBI, to remain available until September 30, 2009. Note: Report language accompanying the Act explains that within that amount is $70,000,000 to increase investigators and research capabilities in TBI and regenerative medicine across the Armed Forces involving an intramural start-up for the study of blast injury to the brain and post traumatic stress by studying actual combat casualties cared for at Walter Reed Army Medical Center and the National Naval Medical Center and using sophisticated neuroimaging technology at the NIH Clinical Center. (P.L. 110-252)

July 29, 2008—The Carolyn Pryce Walker Conquer Childhood Cancer Act amends Title IV of the PHS Act to require the HHS secretary, in collaboration with the NIH director and other Federal agencies with an interest in the prevention and treatment of pediatric cancer, to continue to enhance, expand, and intensify pediatric cancer research. The Act authorizes the HHS secretary to award grants for public awareness of pediatric cancers and available treatments and research and requires the secretary, acting through the director of the CDC, to award a grant to enhance and expand the infrastructure to track the epidemiology of pediatric cancer into a comprehensive nationwide registry. (P.L. 110-285)

October 8, 2008—The Breast Cancer and the Environment Act requires the HHS secretary to establish an Interagency Breast Cancer and Environmental Research Coordinating Committee on which representatives from 7 Federal agencies will serve, including the NIH, as well as 12 additional non-Federal members. The Interagency Breast Cancer and Environmental Research Coordinating Committee will share and coordinate information on existing research activities and make recommendations to NIH and other Federal agencies regarding improving existing research programs related to breast cancer research; develop a comprehensive strategy; and advise NIH and other Federal agencies in the solicitation of proposals for collaborative, multidisciplinary research. (P.L. 110-354)

October 8, 2008—The Paul D. Wellstone Muscular Dystrophy Community Assistance, Research, and Education Amendments Act, 2008, creates in statute the Muscular Dystrophy Centers of Excellence as the Paul D. Wellstone Muscular Dystrophy Cooperative Research Centers; names NHLBI as a member of the Muscular Dystrophy Coordinating Committee (MDCC); and authorizes MDCC to give special consideration to enhancing the clinical research infrastructure to test emerging therapies for the various forms of muscular dystrophy. (P.L. 110-361)

October 8, 2008—The Prenatally and Postnatally Diagnosed Conditions Awareness Act provides that the HHS secretary may, acting through the director of NIH, the director of CDC, or administrator of HRSA, oversee activities such as the awarding of grants and contracts in order to accomplish the goals of providing information and coordination of available support networks to parents of children diagnosed with Down syndrome or other prenatally or postnatally diagnosed conditions. Grant awardees are required to provide "up to date, evidence based, written information concerning the range of outcomes for individuals living with the diagnosed condition, including physical, developmental, educational, and psychosocial outcomes." (P.L. 110-374)

October 13, 2008—The Comprehensive Tuberculosis Elimination Act of 2008 amends the PHS Act to authorize the NIH director to expand, intensify, and coordinate tuberculosis research and development and related activities of the national research institutes with the goal of eliminating the disease. These activities may include enhancing basic and clinical research on TB, including drug-resistant TB; expanding research on the relationship between TB and HIV; and developing new tools for the elimination of TB, including public health interventions and methods to enhance the detection of and responses to outbreaks of TB and its drug-resistant forms. (P.L. 110-392)

February 17, 2009—The American Recovery and Reinvestment Act of 2009 included $10 billion for NIH, which is available until September 30, 2010 (plus $400 million from AHRQ. Funds for NIH were specified as follows:

$1.3 billion for NCRR, of which $1 billion is for competitive awards for the construction and renovation of extramural research facilities and $300 million for the acquisition of shared instrumentation and other capital research equipment.

$8.2 billion for the NIH Office of the Director, of which $7.4 billion is designated for transfer to Institutes and Centers and to the Common Fund, with the remaining $800 million to be retained in the OD to be used for purposes that can be completed within 2 years; priority is to be placed on short-term grants that focus on specific scientific challenges, new research that expands the scope of ongoing projects, and research on public and international health priorities. Bill language is included to permit the NIH director to use $400 million for the flexible research authority authorized in section 215 of Division G of P .L. 110-161. The funds available to NIH can be used to enhance central research support activities. Bill language also indicates that the funds provided in this Act to NIH are not subject to Small Business Innovation Research (SBIR) and Small Business Technology Transfer (SBTT) set-aside requirements.

$500 million for NIH Buildings and Facilities, for construction as well as renovation.

For purposes of this stimulus funding, there are some requirements regarding "Buy American" pertaining to American iron, steel and manufactured goods. (P.L. 111-5)

March 11, 2009—The FY 2009 Omnibus Appropriations Act includes $30.3 billion for the 26 accounts that comprise the NIH total appropriation; continues the allocation to NIH of $8,200,000 in program evaluation set-aside funding, consistent with the budget request; transfers $1,000,000 from the Office of the Secretary to be provided to NIMH for the Interagency Autism Coordinating Committee; modifies a general provision requiring NIH-funded authors to deposit final manuscripts in the NLM's PubMed Central by making the provision permanent; and includes a general provision requiring the HHS secretary to issue an advanced notice of proposed rulemaking regarding conflicts of interest among extramural NIH investigators.

The Interior portion of the law includes $78 million for NIEHS worker training and research programs. The Financial Services and General Government portion contains a moratorium on A-76 studies and competitions for FY 2009. (P.L. 111-8)

March 30, 2009—Omnibus Public Land Management Act of 2009 included provisions of the Christopher and Dana Reeve Paralysis Act, which authorized NIH to develop mechanisms to coordinate the paralysis research and rehabilitation activities of its Institutes and Centers in order to further advance such activities and avoid duplication; establish research consortia, to be designated the Christopher and Dana Reeve Paralysis Research Consortium; and the NIH director to award grants for multicenter networks of clinical sites that will collaborate to design clinical rehabilitation intervention protocols and measures of outcomes on different forms of paralysis. (P.L. 111-11)

September 30, 2009—The Small Business Act and Small Business Investment Act of 1958, Extension, provided a 1-month temporary extension of programs authorized under the 2 Acts, including the SBIR and STRR programs of NIH, through October 30, 2009. (P.L. 111-66)

October 28, 2009—The National Defense Authorization Act for FY 2010 required the Department of Defense "to provide" for chiropractic clinical trials to be conducted by NIH or an independent academic institution. (P.L. 111-84)

October 30, 2009—The Small Business Act and Small Business Investment Act of 1958, Extension, provided a 1-month temporary extension of programs authorized under the 2 Acts, including the SBIR and STTR programs of NIH through January 31, 2010. (P.L. 111-89)

December 16, 2009—The Consolidated Appropriations Act, 2010, provides $31 billion for NIH. Provisions of note in Section IV (Labor, HHS, and Education include the following:

Provides up to $193.8 million for continuation of the National Children's Study.

Changes the current needle or syringe exchange prohibition such that the use of funds to distribute any needle or syringe to prevent the spread of blood-borne pathogens would be prohibited in areas that local public health or law enforcement agencies determine to be inappropriate—thus allowing the use of funds in areas that are deemed appropriate. Continues provisions that bar the use of funds for the creation of human embryos for research or research in which embryos are destroyed. (P.L. 111-117)

2010

January 29, 2010—A bill to provide for an additional temporary extension of programs under the Small Business Act and the Small Business Investment Act of 1958. Extends the SBIR and STTR programs through April 30, 2010. (P.L. 111-136).

March 23, 2010—The Patient Protection and Affordable Care Act establishes the Cures Acceleration Network within the Office of the NIH director, names the NIH director (or his designee) as a member of the Patient-Centered Outcomes Research Institute (comparative effectiveness research) Board of Governors, and re-designates the National Center for Minority Health and Health Disparities as an institute. In addition, the Act requires the HHS secretary to contract with the Institute of Medicine to hold a conference on pain and to establish an Interagency Pain Research Coordinating Committee; the Secretary delegated these responsibilities to NIH. The Cures Acceleration Network provides 2 unique authorities: the ability to use "other transactions authority" and the authority to require matching funds from funding recipients. (P.L. 111-148)

April 30, 2010—A bill to provide for an additional temporary extension of programs under the Small Business Act and the Small Business Investment Act of 1958. Extends the SBIR and STTR programs through July 31, 2010. (P.L. 111-162)

July 30, 2010—A bill to provide for an additional temporary extension of programs under the Small Business Act and the Small Business Investment Act of 1958. Extends the SBIR and STTR programs through September 30, 2010. (P.L. 111-214)

September 30, 2010—A bill to provide for an additional temporary extension of programs under the Small Business Act and the Small Business Investment Act of 1958. Extends the SBIR and STTR programs through January 31, 2011. (P.L. 111-251)

December 15, 2010—The Medicare and Medicaid Extenders Act extended funding for the special diabetes program for type 1 diabetes under section 330B(b)(2)(c) of the Public Health Service Act through FY 2013 at $150 million. (P.L. 111-309)

December 18, 2010—The Charles "Pete" Conrad Astronomy Awards Act re-codifies the following existing law to a new Title 51, USC: The bill requires NASA and NIH to establish a working group to coordinate biomedical research activities in areas where microgravity environment may contribute to significant progress in the understanding and treatment of diseases and other medical conditions; requires NASA and NIH to establish a joint biomedical research grant program; and requires NASA and NIH to establish a joint graduate research fellowship program. (P.L. 111-314)

December 22, 2010—The Early Hearing Detection and Intervention Act reauthorizes, through FY 2015, section 399M(b)(2) of the Public Health Service Act, which requires the National Institute on Deafness and Other Communication Disorders to "continue a program of research and development on the efficacy of new screening techniques and technology, including clinical studies of screening methods, studies on efficacy of intervention, and related research." (P.L. 111-337)

January 4, 2011—The America COMPETES Reauthorization Act, section 105 permits any agency head to "carry out a program to award prizes competitively to stimulate innovation that has the potential to advance the mission of the respective agency." (P.L. 111-358)

January 31, 2011—A bill to provide for an additional temporary extension of programs under the Small Business Act and the Small Business Investment Act. Extends the SBIR/STTR program through May 31, 2011. (P.L. 112-1)

June 1, 2011—The Small Business Additional Temporary Extension Act extends the SBIR/STTR program through September 30, 2011. (P.L. 112-17)

September 30, 2011—The Combating Autism Reauthorization Act reauthorizes autism activities and the interagency autism coordinating committee through FY 2014. The Act requires a progress report due 2 years after enactment. (P.L. 112-32)

September 30, 2011—The Continuing Appropriations Act, 2012, extends the SBIR/STTR program through October 4, 2011. (P.L. 112-33)

October 5, 2011—The Continuing Appropriations Act, 2012, extends the SBIR/STTR program until November 18, 2011. (P.L. 112-36)

November 18, 2011—The Consolidated and Further Continuing Appropriations Act of 2012 extends the SBIR/STTR program until December 16, 2011. (P.L. 112-55)

December 16, 2011—A bill making further continuing appropriations for FY 2012 and for other purposes, extends the SBIR/STTR program until December 17, 2011. (P.L. 112-67)

December 17, 2011—A bill making further continuing appropriations for FY 2012 and for other purposes, extends the SBIR/STTR program until December 23, 2011. (P.L. 112-68)

December 23, 2011—The Consolidated Appropriations Act, FY 2012, includes funding for the Departments of Labor, Health and Human Services, and Education, and for NIH in the amount of $30.689 billion. This measure also creates the NIH National Center for Advancing Translational Sciences (NCATS) and abolishes the National Center for Research Resources (NCRR). The Cures Acceleration Network authority established in the Patient Protection and Affordable Care Act was relocated to the NCATS authority and several conforming changes were made. Several NCRR authorities were moved to other parts of the statute. (P.L. 112-74)

December 23, 2011——The Breast Cancer Stamp Reauthorization Act reauthorizes the breast cancer stamp through December 2015. Seventy percent of the proceeds from the stamp would be provided to NIH and the remainder to support breast cancer research funded by the Department of Defense. (P.L. 112-80)

December 31, 2011—The National Defense Authorization Act for FY 2012 reauthorizes the SBIR/STTR programs for 6 years and increases SBIR/STTR awards to $150,000 for phase I and $1 million for phase II awards. Provisions of particular interest to NIH would increase the SBIR set aside to 3.2% over 6 years and increase the STTR set aside to 0.45% over 6 years; allow small business concerns majority-owned and controlled by venture capital firms to be eligible for up to 25% of the SBIR funds; allow agencies to apply for waivers to exceed the hard cap on awards under the guidelines for phase I and phase II awards; and grant NIH a 1-year exception to the rule shortening the time span for final decisions to not more than 90 days after the date a solicitation closes. (P.L. 112-81)

July 9, 2012—The Food and Drug Administration Safety and Innovation Act reauthorizes user fees for the FDA. Directly related to NIH is a provision that reauthorizes section 409I(e)(1) of the PHS Act for the Program for Pediatric Studies of Drugs at $25 million for each of FYs 2013 to 2017. (P.L. 112-144)

January 2, 2013—The National Defense Authorization Act for FY 2013 includes the Recalcitrant Cancer Research Act, which requires the NCI director to develop scientific frameworks for the study of pancreatic cancer and lung cancer. NCI is authorized to develop additional frameworks. (P.L. 112-239)

January 2, 2013—The American Taxpayer Relief Act includes a provision to extend the special diabetes program for type 1 diabetes at its current rate of $150 million through 2014; delays the sequestration for 2 months; and reduces the total automatic cut for FY 2013. (P.L. 112-240)

March 26, 2013—The Consolidated and Further Continuing Appropriations Act of 2013 is an omnibus continuing resolution to fund the agencies of the federal government through September 30, 2013. The bill continues funding for the NIH under the same terms and conditions as for FY 2012 and includes the requirement for the sequester. For NIH, this is approximately 5%. The bill generally funds other government departments and agencies for FY 2013 at their FY 2012 enacted levels. Almost all FY 2013 funding provided by the measure subsequently would be reduced across the board as required by the sequestration ordered by the President on March 1; the Office of Management and Budget estimates that nondefense discretionary accounts subject to sequestration will be reduced by 5%. For NIH, the final bill includes an increase of about $70 million (before sequester), along with language requiring the director of NIH to contract with the Institute of Medicine to study the methodology underlying the National Children's Study. The bill continues the federal employee pay freeze through the remainder of calendar year 2013. It also provides government-wide restriction on conferences: "None of the funds made available in this or any other appropriations Act may be used for travel and conference activities that are not in compliance with Office of Management and Budget Memorandum M-12-12 dated May 11, 2012." The NIH program level after sequester is $29,151,462,000.

For more information on legislation affecting NIH, go to http://olpa.od.nih.gov.

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Deputy Directors

Lawrence Tabak, Principal Deputy Director, NIH
Kathy Hudson, Deputy Director for Science, Outreach, and Policy
Michael Gottesman, Deputy Director for Intramural Research
Sally J. Rockey, Deputy Director for Extramural Research
Colleen Barros, Deputy Director for Management and Chief Financial Officer
James M. Anderson, Deputy Director for Program Coordination, Planning, and Strategic Initiatives

CHRONOLOGY OF DEPUTY DIRECTORS

Name	In Office from	To
C. J. Van Slyke	December 3, 1958	December 1, 1959
David E. Price	July 1, 1960	June 30, 1962
Stuart M. Sessoms	August 1, 1962	July 31, 1968
G. Burroughs Mider[1]	July 1, 1960	May 19, 1968
John. F. Sherman	November 1, 1968	March 16, 1974
Robert W. Berliner[2]	February 23, 1969	September 1, 1973
Carl M. Leventhal[1,2]	September 1973	February 1974
DeWitt Stetten, Jr.[2]	March 17, 1974	September 11, 1979
Ronald W. Lamont-Havers	August 4, 1974	September 25, 1976
Thomas E. Malone	March 24, 1977	Aug. 1, 1986
Robert Goldberger[2]	September 11, 1979	June 26, 1981
Joseph E. Rall[3]	July 2, 1981	June 6, 1982
Philip S. Chen, Jr.[3]	June 7, 1982	March 18, 1983
William F. Raub[4]	April 3, 1983	November 1991
Joseph E. Rall[5]	June 1983	May 13, 1991
Katherine Bick[4]	May 19, 1987	March 1990
John Diggs[4]	August 1990	June 14, 1993
Lance Liotta[5]	July 6, 1992	August 1993
Jay Moskowitz[6]	March 1993	October 1993
John D. Mahoney	March 21, 1993	February 19, 1995
Ruth L. Kirschstein	November 1993 May 2002	December 1999 February 8, 2003
Michael Gottesman[5]	November 1993	Present
Wendy Baldwin[4]	February 1994	December 2002
Anthony Itteilag	January 7, 1996	October 2001
Yvonne Maddox (Acting)	January 1, 2000	May 18, 2002
Charles E. Leasure, Jr.[7]	October 7, 2001	February 3, 2004
Raynard S. Kington	February 9, 2003 August 17, 2009	October 2008 August 20, 2010

Norka Ruiz Bravo[4]	October 30, 2003	October 31, 2008
Colleen Barros[8]	May 30, 2004	Present
Alan Krensky[9]	July 8, 2007	October 31, 2008
Sally J. Rockey[4]	August 15, 2010	Present
Lawrence A. Tabak	August 23, 2010	Present
Kathy Hudson	October 24, 2010	Present
James M. Anderson	September 27, 2010	Present

[1] Held title Director of Laboratories and Clinics.
[2] For Science.
[3] For Science, Acting.
[4] For Extramural Research.
[5] For Intramural Research.
[6] Named by NIH director as NIH principal deputy director and NIH deputy director for Science Policy and Technology Transfer.
[7] For Management.
[8] For Management and Chief Financial Officer.
[9] For Portfolio Analysis and Strategic Initiatives.

BIOGRAPHICAL SKETCHES

Cassius James Van Slyke, M.D.

Dr. Van Slyke, first deputy director of NIH, served in that position from December 3, 1958, until his retirement on December 1, 1959. He received his M.D. in 1928 from the University of Minnesota and entered the PHS reserve corps that same year.

In 1932 he was commissioned in the regular corps and from 1936 to 1944 pursued a distinguished research career at the PHS Venereal Disease Research Laboratory in Staten Island, N.Y. In 1944, he was made assistant chief, Venereal Disease Division, Washington, D.C.

Dr. Van Slyke joined NIH in 1946 as chief of the newly established Research Grants Office, later renamed the Division of Research Grants, serving there until he was named director of the National Heart Institute (NHI) on August 1, 1948. He left NHI on November 30, 1952, to serve as associate director of NIH, a post he held until he was named NIH deputy director.

David E. Price, M.D.

Dr. Price earned his medical degree at the University of California School of Medicine at Berkeley in 1940, and served his internship at the PHS Hospital in San Francisco. In 1946, he received his doctorate in public health at Johns Hopkins University School of Hygiene and Public Health.

Following a tour of duty in the Venereal Disease Division, PHS, he was assigned first to the DRG as assistant to the chief (1946-47) and then to the NCI as chief of the Research Grants Branch (1947-48). He returned to DRG in 1948 as chief, a post he held until he was named NIH associate director for extramural affairs (1950-52).

After a series of key appointments in the Office of the Surgeon General, the Bureau of Medical Services and the Bureau of State Services, Dr. Price was named deputy director of NIH on July 1, 1960. Two years later, he was appointed deputy surgeon general, PHS.

He retired from the service in 1965. After his retirement, he was associated with the Ford Foundation and the American Public Health Association.

Dr. Price was director of planning of the medical institutions, the Johns Hopkins Medical Institution, Baltimore, MD, until his retirement on July 1, 1980.

Stuart M. Sessoms, M.D.

Dr. Sessoms came to NIH in 1953 as a member of the NCI staff. From 1955 to 1957 he was assistant director of the Clinical Center. He was appointed assistant director, NCI, on January 1, 1958, prior to his appointment in November 1958 as chief of NCI's Cancer Chemotherapy National Service Center.

During this period, Dr. Sessoms also served as NCI associate director (1960), and associate director for collaborative research (1961) with responsibility for the institute's Virology Research Resources Branch, in addition to his duties at the Cancer Chemotherapy National Service Center.

He became the third NIH deputy director on August 1, 1962, serving in that capacity until his retirement July 31, 1968. On retirement, he held the rank of assistant surgeon general (rear admiral) in the PHS.

During his career at NIH, Dr. Sessoms was the recipient of two Meritorious Service Awards for his accomplishments as head of the Cancer Chemotherapy National Service Center, and for "outstanding ability and achievements in the development, operation and staffing" of the Regional Medical Programs.

He received his B.S. in pharmacy at the University of North Carolina in 1943 and his M.D. from the Medical College of Virginia in 1946.

On retiring after 25 years of government service, Dr. Sessoms joined Duke University.

On Jan. 1, 1976, he was named president of Blue Cross and Blue Shield of North Carolina.

G. Burroughs Mider, M.D.

Dr. Mider, whose career at NIH reaches back to 1939, is well-known on the campus. Just prior to transferring to the National Library of Medicine, an NIH component, in 1968, Dr. Mider had served for 8 years as NIH director of laboratories and clinics (1960-68), in which he functioned as deputy director as well.

He first came to NIH as a research fellow, NCI, in 1939. On completing the fellowship, he became an instructor in pathology and assistant professor of pathology (1941-44) at Cornell Medical College. Concurrently, he was an assistant pathologist at New York Hospital.

Then came assignments as associate professor of pathology, University of Virginia School of Medicine (1944-45) and research associate in surgery and professor of cancer research, University of Rochester School of Medicine and Dentistry (1945-52).

On returning to NIH in 1952, he became NCI associate director in charge of research. In 1960 he was appointed NIH director of laboratories and clinics. In May 1968, Dr. Mider transferred to the NLM as special assistant to the director for medical program development and evaluation. The following year he was named acting deputy director, and in 1970 became NLM deputy director.

In 1960, he was the recipient of a DHEW Distinguished Service Award. Dr. Mider retired from the Library on June 30, 1972, to become executive officer for the Universities Associated for Research and Education in Pathology, Inc., and the American Society of Experimental Pathology.

John F. Sherman, Ph.D.

Dr. Sherman was appointed deputy director of NIH on November 1, 1968, after a long career in research and research grants administration. He was designated by HEW Secretary Richardson as acting director of NIH on January 21, 1973, and served until a new director was appointed on May 29, 1973. He then returned to the position of deputy director.

He came to NIH in January 1953 as a research pharmacologist in the Laboratory of Tropical Diseases, National Microbiological Institute, which became the NIAID in 1955.

In July 1956, Dr. Sherman joined the staff of the NIAMD as assistant to the chief of extramural programs. He became assistant chief of the institute's extramural programs in August 1957, and deputy chief in October 1958.

On July 1, 1961, he was appointed associate director for extramural programs, NINDB. He rejoined the NIAMD in 1962 as associate director for extramural programs, serving in that capacity until January 1, 1964, when he was named NIH associate director for extramural programs.

Dr. Sherman received his B.S. in 1949 from Union University College of Pharmacy in Albany, N.Y., and his Ph.D. in pharmacology in 1953 from Yale University.

He is the author of numerous scientific papers and articles in his field of research. In 1971, he received a DHEW Distinguished Service Award.

Dr. Sherman left NIH in 1974 to become vice president of the Association of American Medical Colleges and director of the association's department of planning and policy development.

Robert W. Berliner, M.D.

Dr. Berliner, the first NIH deputy director for science, is an internationally renowned renal physiologist whose research in the field has contributed to understanding of the control of the excretion of sodium and potassium salts.

For 12 years (1950-62), he was chief of the Laboratory of Kidney and Electroyte Metabolism, NHI, and from 1954 to 1968 served as the institute's director of intramural research.

In 1968, he was appointed director of laboratories and clinics, NIH. He was named to the newly created post of deputy director for science in 1969.

Prior to joining NIH in 1950, Dr. Berliner was assistant professor of medicine at Columbia University, and research associate with the New York City department of hospitals.

He received his B.S. from Yale University and his M.D. from Columbia University in 1939. He served his internship and residency at the Presbyterian Hospital and Goldwater Memorial Hospital, respectively, both in New York.

He was elected to the National Academy of Sciences in 1968. Other honors include the PHS Distinguished Service Award (1962), the Homer W. Smith Award (1965), the Modern Medicine Award for Distinguished Achievement (1969), and the American Heart Association's Research Achievement Award (1970).

Dr. Berliner left NIH to accept appointment as dean of the Yale University Medical School in September 1973.

DeWitt Stetten, Jr., M.D., Ph.D.

Dr. Stetten, an eminent medical educator and researcher in metabolic diseases, was named NIH deputy director for science on March 17, 1974.

He received his A.B. degree from Harvard College in 1930, and his M.D. and Ph.D. from Columbia University in 1934 and 1940, respectively. From 1934 to 1937, he

took his internship and residency at Bellevue Hospital in New York. Dr. Stetten then joined the staff at Columbia University for 9 years, serving successively as assistant instructor and assistant professor of biochemistry. In 1947, he was appointed assistant professor in biological chemistry at the Harvard Medical School. From 1948 to 1954, he was chief of the division of nutrition and physiology for the Public Health Research Institute of New York City.

Dr. Stetten first came to NIH in 1954 as director of the intramural research program of the National Institute of Arthritis and Metabolic Diseases. In that capacity, he directed institute programs on basic and clinical research in diabetes, vitamin deficiencies, and disorders of the blood, bone, and liver. He left NIH in 1962 to become the first dean of the Rutgers Medical School, a position he held until his return to NIH on October 1, 1970, as director of the National Institute of General Medical Sciences.

The American Diabetes Association awarded Dr. Stetten the Banting Medal in 1957. In 1963, he delivered the 22nd annual NIH Lecture on the "History and Natural History of Gout."

Among his many honors were the DHEW Superior Service Honor Award (1973) and the DHEW Distinguished Service Award (1977). He also received honorary D.Sc. degrees from Washington University (1974), and from the College of Medicine and Dentistry of New Jersey (1976).

Author of more than 100 original papers in his field of research, and coauthor of the early editions of the textbook, *Principles of Biochemistry,* Dr. Stetten served on the editorial boards of numerous scientific and medical journals. He was president of the Foundation for Advanced Education in the Sciences (1972-74), and was a member of the National Academy of Sciences and the NAS Council. He was president of the Society for Experimental Biology and Medicine, 1977-79.

Dr. Stetten was named senior scientific advisor to the NIH director in September 1979.

Ronald W. Lamont-Havers, M.D.

Dr. Lamont-Havers, internationally known rheumatologist, was appointed deputy director of NIH on August 4, 1974, after serving in an acting capacity since May 20.

Prior to this appointment, he had been deputy director of the National Institute of Arthritis, Metabolism, and Digestive Diseases (1972-74), and NIH associate director for extramural research and training for 4 years (1968-72).

He received his B.A. in 1942 from the University of British Columbia, Canada, and M.D. in 1946 from the University of Toronto. He took staff and residency training (1946-48) at the Vancouver General Hospital, and residency in internal medicine (1949-51) at the Queen Mary Veterans Hospital in Montreal. From 1951 to 1953, he was a fellow of the Canadian Arthritis and Rheumatism Society at Columbia Presbyterian Hospital, College of Physicians and Surgeons, Columbia University. He also received a diploma in internal medicine in 1953 from McGill University.

He came to NIH in 1964 as associate director for extramural programs, NIAMD. From 1955 to 1964 he was national medical director of the Arthritis Foundation and an instructor in medicine, College of Physicians and Surgeons, Columbia University. Previously, he served as medical director of the Canadian Arthritis and Rheumatism Society, British Columbia division, Vancouver, from 1953 to 1955, and as associate medical director, Student Health Service, University of British Columbia (1948-49).

Dr. Lamont-Havers, author or coauthor of numerous papers on arthritis and rheumatism, was honored in June 1973 with a DHEW Superior Service Award.

He left NIH in September 1976 to become deputy for research policy and administration to the general director, Massachusetts General Hospital, Boston.

Thomas E. Malone, Ph.D.

Dr. Malone, whose career at the NIH began in 1962, was named the sixth deputy director of NIH in March 1977.

He earned his B.S. and M.S. degrees from North Carolina Central University in 1948 and 1949 respectively, and his Ph.D. from Harvard University in 1952. During the period 1950-52 he held a teaching fellowship at Harvard University.

Dr. Malone was professor of zoology at N.C. Central University in Durham from 1952 to 1958. He left that position to accept a postdoctoral fellowship of the NAS National Research Council, serving as a resident research associate at Argonne National Laboratory from 1958 to 1959. He subsequently served on the faculty at Loyola University in Chicago until joining the NIH staff in 1962.

He came to NIH as a member of the Grants Associates Program. After completing a year's training, he joined the staff of the National Institute of Dental Research in 1963, serving in several capacities - from 1963 to 1964 he was assistant chief of the research grants section; 1964 to 1966, deputy chief, extramural programs; and 1966 to 1967, chief, periodontal diseases and soft tissue studies, extramural programs.

In 1967 Dr. Malone accepted a position as professor and chairman of the department of biology at the American University of Beirut, Lebanon. He returned to NIDR in 1969, where he was associate director for extramural programs until 1972 when he was appointed NIH associate director for extramural research and training, a position which he held until his appointment as deputy director of NIH.

He is a member of the Institute of Medicine and of numerous other professional organizations in health research and administration.

In June of 1971 Dr. Malone received the DHEW Superior Service Award and was honored in April 1974 with the DHEW Distinguished Service Award. In October 1975 the American College of Dentists presented him with a Certificate of Merit. He received a Senior Executive Service Presidential Merit Award in 1980 and a Senior Executive Service Presidential Distinguished Executive Rank Award in 1983.

He served as a member of the U.S. Delegation to the 31st through 35th World Health Assemblies and has participated in numerous other international health activities.

Upon the resignation of Dr. Fredrickson, Dr. Malone was named acting NIH director until the appointment of Dr. Wyngaarden.

Robert Goldberger, M.D.

A highly regarded scientist in biomedical research, Dr. Goldberger became NIH deputy director for science in September 1979.

After receiving his A.B. degree from Harvard College in 1954, he attended the New York University Medical School, where he obtained an M.D. in 1958. He interned at Mt. Sinai Hospital in New York, and then spent 2 years as a post- doctoral fellow at the University of Wisconsin's Institute for Enzyme Research. He came to the NIH as a research associate in the National Heart Institute in 1961, working with Dr. C. B. Anfinsen on the mechanism by which newly synthesized polypeptide chains attain three-dimensional structures characteristic of native proteins. In 1963 he was a visiting scientist at the Weizmann Institute of Science.

Dr. Goldberger served as a biochemist in the Laboratory of Chemical Biology, NIAMD, from 1963 to 1966, when he became chief of that laboratory's Biosynthesis and Control Section. He worked on regulation of gene expression in bacteria.

In 1973 he moved to the NCI's Division of Cancer Biology and Diagnosis, where, as chief of the cellular regulation section, he worked on hormonal regulation of gene expression in avian liver.

Dr. Goldberger has written one book on biochemistry and has edited a multivolume treatise on biological regulation. From 1970 to 1971 he served as president of NIH's Inter-Assembly Council of the Assemblies of Scientists. He received the Superior Service Award, DHEW, in 1973 and the Meritorious Service Medal, USPHS, in 1977.

At the end of June 1981, he left NIH to accept a dual position as provost of Columbia University and vice president for health sciences, and as a professor of chemistry.

William F. Raub, Ph.D.

Dr. Raub was appointed deputy director in August 1986. Since June 1983, he had served as deputy director for extramural research and training coordinating the development and implementation of policies affecting extramural programs.

Upon the resignation of Dr. Wyngaarden, July 31, 1989, Dr. Raub was named acting NIH director.

He was NIH associate director for extramural research and training previous to this appointment. He has served as associate director, National Eye Institute (1975-78), and chief, Biotechnology Resources Branch, Division of Research Resources (1969-75). He joined NIH in 1966.

Dr. Raub led the effort to develop the PROPHET system, a national computer resource for pharmacologists and others who study chemical/biological interactions. PROPHET is the most nearly comprehensive set of information-handling tools for this area of science ever to be presented in a unified system, and offered as a service to the biomedical community.

A graduate of Wilkes College in Wilkes-Barre, Pa., in 1961, he received his Ph.D. in 1965 from the University of Pennsylvania.

Joseph E. Rall, M.D., Ph.D.

Dr. Rall was appointed deputy director for intramural research in June 1983. He advised the NIH director on general scientific matters and intramural research policies and coordinated the intramural research program.

With NIH since 1955, he was director of the division of intramural research at the National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases for more than 20 years.

Dr. Rall received his M.D. from Northwestern University School of Medicine (1945) and Ph.D. from the University of Minnesota (1952). He received honorary degrees from North Central College, (1966), the Free University of Brussels (1975), and the University of Naples (1985). He was elected to the NAS in 1980 and to the American Academy of Arts and Sciences in 1985. In 1988 he was invited to become a member of the scientific advisory committee for the International Human Frontier Science Program.

A member of many organizations and the coauthor of more than 160 scientific articles, his research involves thyroid hormones, iodine metabolism, and thyroid diseases.

In addition to the Van Meter Prize (1950) and the Robert Williams Distinguished Leadership Award of the Endocrine Society (1983), Dr. Rall has received the Arthur S. Flemming Award (1959), the DHHS Superior Service Award (1965), and the Distinguished Service Award (1968).

Katherine L. Bick, Ph.D.

Dr. Bick was named NIH deputy director for extramural research in April 1987. As a principal advisor to the NIH director, she coordinated the development and implementation of policies affecting NIH extramural programs.

She joined NIH in 1976 as a scientist administrator in the Neurological Disorders Program, NINCDS. In September 1983 she was appointed NINCDS deputy director, after serving in an acting capacity since February 1981. While in this position she received a PHS Special Achievement Award for sustained superior work performance.

Dr. Bick received her undergraduate degree from Acadia University, Nova Scotia, and earned her Ph.D. from Brown University. She has held academic positions at Georgetown University and California State University, Northridge, and research positions at the UCLA School of Medicine and the University of Western Ontario.

Among her many honors are the PHS Superior Service Award (1986), Senior Executive Service Bonus Award for Performance (1984-88), and the NIH Director's Award (1977). In 1989 she received a Presidential Senior Rank Award.

Dr. Bick left NIH in April 1990.

John W. Diggs, Ph.D.

Dr. Diggs was appointed NIH deputy director for extramural research on July 29, 1990. He had been director of the NIAID Division of Extramural Activities since 1982.

A biology major at Lane College in Jackson, Tenn., he earned his M.S. (1969) and Ph.D. (1972) in physiology from Howard University. His postdoctoral work included serving as a senior research physiologist at Walter Reed Army Institute of Research.

Dr. Diggs joined NINDS in 1974 as a health scientist administrator and received the institute's Special Achievement Award in 1979. He received the NIH Director's Award in 1985, the Presidential Meritorious Executive Rank Award in 1987, and the PHS Superior Service Award in 1990.

Included in his other honors are the Super Achiever in Science Award of Lane College National Alumni (1989), Merit Award of the District of Columbia General Hospital (1989), Outstanding Service Award of Montgomery Count Department of Health (1989), Outstanding Service Award of Maryland Congress of Parents and Teachers, Inc. (1989), the Distinguished Senior Professional Award from the Inter- national Professional Management Association (1986), and Howard's Distinguished Alumni Award (1979).

He served the NIH until 1993.

Lance A. Liotta, Ph.D., M.D.

Dr. Liotta was named NIH deputy director for intramural research and training on July 6, 1992. He joined the Office of the Director after simultaneously serving since 1982 in three NCI Laboratory of Pathology positions: chief, tumor invasion and metastases section; lab chief; and codirector, Anatomic Pathology Residency Program.

He earned his A.B. degree in general science and biology from Hiram College in Ohio, followed by his Ph.D. in biomedical engineering and biomathematics from Case Western Reserve University. In 1976 he earned his M.D. from Case Western and joined NIH as a PHS resident physician in the NCI Laboratory of Pathology.

Dr. Liotta has devoted his career to the study of cancer invasion and metastasis, the major cause of cancer treatment failure. He was one of the first scientists to investigate this process at the molecular level. In 1975 he proposed that tumor cell attachment and degradation of the basement membrane (a collagenous sheath that surrounds epithelial ducts, blood vessels and nerves, and separates tissue compartments) was crucial to invasion and metastasis.

He found that disruption of the basement membrane is the general hallmark of the transition from in situ to invasive cancer for all human epithelial cancers. He discovered metallo-proteinases produced by tumor cells that degrade the metastasis; TIMP-2 (Dr. William Stetler-Stevenson), a new protein that inhibits invasion and angiogenesis; laminin-binding proteins (Dr. Mark Sobel) that mediate tumor cell attachment; and autotaxin (Dr. Mary Stracke), a protein that profoundly stimulates motility.

Dr. Liotta's group also developed the first synthetic compound (CAI) (Dr. Elise Kohn) that blocks cancer metastasis growth by inhibiting selected signal transduction pathways. CAI has now entered clinical phase I trials under support from the Division of Cancer Treatment.

He is a member of the International Metastasis Research Society, American Association for Cancer Research, American Association of Pathologists, American Society of Cell Biology, American Society for Clinical Investigation, and the International Academy of Pathology.

Dr. Liotta has received numerous awards including three PHS Commissioned Corps Medals, the Arthur S. Flemming Award, the Warner Lambert/Parke Davis Award, the Josef Steiner Prize, and the Lil Gruber Research Award. He holds more than 30 patents for his work.

Jay Moskowitz, Ph.D.

Dr. Moskowitz was named by the NIH director as NIH principal deputy director and NIH deputy director for science policy and technology transfer in March 1993. He voluntarily resigned in October 1993.

In October 1993, Dr. Moskowitz became deputy director of the National Institute on Deafness and Other Communication Disorders (NIDCD) and acting director of NIDCD's Division of Intramural Research. He earlier served as founding and acting director of NIDCD, which was established in 1988.

Dr. Moskowitz joined NIH in 1969 as a postdoctoral pharmacology research associate with the National Institute of General Medical Sciences. In 1971 he became a grants associate with the Division of Research Grants.

From 1972 to 1986, Dr. Moskowitz held several administrative positions with the National Heart, Lung, and Blood Institute (NHLBI). As acting chief of the Special Programs and Resources Branch, NHLBI, he was responsible for planning and developing the Young Investigator Pulmonary Research Grant Program.

From 1986 to 1987, Dr. Moskowitz was NIH associate director for program planning and evaluation and executive director of the NIH Centennial Observance. From 1987 to 1993, Dr. Moskowitz was NIH associate director for science policy and legislation.

A graduate of Queens College, City University of New York, Dr. Moskowitz received his Ph.D. in 1969 from Brown University. He is the recipient of numerous honors and awards, including the NIH Director's Award in 1987, the PHS Superior Service Award in 1980, the Senior Executive Service Meritorious Executive Rank Award in 1989, and the DHHS Distinguished Service Award in 1991.

Dr. Moskowitz left NIH in 1995. He became senior associate dean (science and technology) and professor of public health sciences at the Wake Forest University School of Medicine in Winston-Salem, North Carolina, and in 2002 was appointed associate vice president for health sciences research and professor of health policy and administration and vice dean for research and professor of medicine at Penn State College of Medicine.

John D. Mahoney

Mr. Mahoney was named NIH deputy director for management on March 21, 1993. He became senior advisor to the NIH director on August 7, 1994.

Mr. Mahoney began his career in the U.S. Public Health Service in 1970 as a budget analyst for the National Institute of Mental Health. From 1972 to 1979, he held several positions in financial and budget management with the Alcohol, Drug Abuse and Mental Health Administration. From 1979 to 1984, he was chief of the Budget Branch in the Office of the Assistant Secretary for Health. In this position he was responsible for planning and coordinating budget estimates for programs of the agencies of the U.S. Public Health Service, including NIH.

From 1984 to 1986, Mr. Mahoney was director of the Office of Financial Management and Administrative Systems for the Health Care Financing Administration.

In 1986, Mr. Mahoney was named NIH associate director for administration, responsible for advising the NIH director on administrative matters and for developing and implementing administrative policies in support of NIH's research mission. He held that position until 1993. Mr. Mahoney was also acting deputy assistant secretary for health operations from 1990 to 1991.

Mr. Mahoney earned a B.A. and M.B.A. from the University of Maryland. He has received numerous awards including the Presidential Rank Award for Meritorious Service in 1990 and 1996; the General Services Administration, Excellence in Administration, Certificate of Merit in 1992; the Department's Distinguished Service Award and the PHS Special Achievement Award in 1990; the Secretary's Award for Exceptional Achievement in 1983; and the PHS Superior Service Award in 1982.

Mr. Mahoney became the deputy administrator, Health Resources and Services Administration, on February 19, 1995, and retired from federal service on December 31, 1996. Since that time he has been an independent consultant to various agencies of the Department of Health and Human Services and nonprofit organizations.

Ruth Kirschstein, M.D.

Dr. Ruth L. Kirschstein served as the NIH Deputy Director until February 8, 2003. She also served as NIH Deputy Director between November 1993 and December 1999. On January 1, 2002, Dr. Kirschstein was named Acting Director, NIH, and continued to serve in that role (technically called Principal Deputy Director) until May 20, 2002. She also served as Acting Director, NIH between July 1993 and November 1993.

Dr. Kirschstein received a B.A. degree magna cum laude in 1947 from Long Island University. She went on to earn her M.D. in 1951 from Tulane University School of Medicine in New Orleans, LA. She interned in medicine and surgery at Kings County Hospital, Brooklyn, and did residencies in pathology at Providence Hospital, Detroit; Tulane University School of Medicine; and the Warren G. Magnuson Clinical Center, NIH.

From 1957 to 1972, Dr. Kirschstein performed research in experimental pathology at the Division of Biologics Standards (now the Center for Biologics Evaluation and Research, FDA). During that time, she helped develop and refine tests to assure the safety of viral vaccines for such diseases as polio, measles, and rubella. Her work on polio led to selection of the Sabin vaccine for public use. For her role, she received the DHEW Superior Service Award in 1971.

In 1972, Dr. Kirschstein became Assistant Director of the Division of Biologics Standards. That same year, when the division was transferred to the FDA as a bureau, she was appointed Deputy Director. She subsequently served as Deputy Associate Commissioner for Science, FDA.

In 1974, Dr. Kirschstein was named Director of the National Institute of General Medical Sciences, NIH. She held that position for over nineteen years. From September 1990 to September 1991, she also served as Acting Associate Director of the NIH for research on women's health.

Dr. Kirschstein has twice taken part in World Health Organization deliberations in Geneva, Switzerland, in 1965 as a member of the WHO Expert Group on International Requirements for Biological Substances, and in 1967 as a consultant on problems related to the use of live poliovirus oral vaccine.

Dr. Kirschstein has received many honors and awards, including the PHS Superior Service Award, 1978; the Presidential Meritorious Executive Rank Award, 1980; election to the Institute of Medicine, 1982; the Public Health Service Equal Opportunity Achievement Award, 1983; a doctor of science, honoris causa, degree from Mt. Sinai School of Medicine, 1984; the PHS Special Recognition Award, 1985; the Presidential Distinguished Executive Rank Award, 1985; the Distinguished Executive Service Award of the Senior Executive Association, 1985; an honorary doctor of laws degree from Atlanta University, 1985; an honorary doctor of science degree from the Medical College of Ohio, 1986; the Harvey Wiley FDA Commissioner's Special Citation, 1987; selection by the Office of Personnel Management as 1 of 10 outstanding executives and organizations for its first group of "Profiles in Excellence," 1989; the Dr. Nathan Davis Award from the AMA, 1990; an honorary doctor of humane letters from Long Island University in 1991; election as a fellow of the American Academy of Arts and Sciences, 1992; and the Public Service Award from the Federation of American Societies for Experimental Biology in 1993.

In 2000, Dr. Kirschstein received the Albert B. Sabin Heroes of Science Award from the Americans for Medical Progress Education Foundation. The following year, she received honorary degrees from Spelman College in Atlanta, GA, and from Georgetown University Medical School in Washington, DC. She was also recognized by the Anti-Defamation League, which bestowed her with their Women of Achievement Award.

Michael Gottesman, M.D.

A well-known and respected basic cancer researcher who has focused on multidrug resistance in human cancer cells, Dr. Gottesman was appointed NIH deputy director for intramural research (DDIR) in November 1993. He had been acting DDIR for the previous year and was acting director of the National Center for Human Genome Research from 1992 to 1993. He continues as chief of NCI's Laboratory of Cell Biology.

He received his B.A. degree from Harvard College in 1966 and earned his M.D. at Harvard Medical School in 1970. He did a medical internship and residency at the Peter Bent Brigham Hospital at the Harvard Medical School.

In 1971 Dr. Gottesman came to NIH as a research associate in the National Institute of Arthritis, Metabolism, and Digestive Diseases (now NIDDK), where he worked for 3 years. He spent a year as an assistant professor at Harvard Medical School and, together with his wife, joined the permanent staff of NCI in 1976. He became chief of the molecular cell genetics section, Laboratory of Molecular Biology, NCI, in 1980 and chief of the Laboratory of Cell Biology, NCI, in 1990.

At NIH, his research interests have ranged from how DNA is replicated in bacteria to how cancer cells elude chemotherapy. In the past several years—collaborating with Dr. Ira Pastan, chief of NCI's Laboratory of Molecular Biology, and others—Dr. Gottesman has identified the human gene responsible for resistance of cancer cells to many of the most common anticancer drugs and has shown that this gene encodes a protein that acts to pump anticancer drugs out of drug-resistant human cancers.

This evidence supports the proposal, now widely accepted, that P-glycoprotein (P-gp), the product of the MDR1 gene, is an energy-dependent pump, ferrying toxins or drugs out of the cell. For several years, Dr. Gottesman has been examining clinical applications of his P-gp findings using transporter reversing agents to fight multidrug resistance and agents that specifically kill P-gp expression cells. Recently, his lab has extended studies of multidrug resistance in cancer to the 47 other known ABC transporters, and drug uptake transporters, and to mechanisms of resistance to the anti-cancer drug cisplatin.

His research has earned him many awards, including the Milken Family Foundation Award for Cancer Research, 1990; C.E. Alken Prize, 1991; the Rosenthal Foundation Award, 1992; and the American Society for Pharmacology and Experimental Therapeutics (ASPET) award, 1997. He was elected a fellow in the American Association for the Advancement of Science in 1988, elected to the Institute of Medicine of the National Academies in 2003, elected to the Association of American Physicians in 2006, and elected to the American Academy of Arts and Sciences in 2010. He received the Public Health Service Commendation, Outstanding Service and Distinguished Service awards, the NIH Director's award in 2002, and the HHS Secretary's Award for Distinguished Service in 2005.

Dr. Gottesman is also a member of the American Association for Cancer Research, the American Society for Biochemistry and Molecular Biology, the Genetics Society of America, the American Society for Pharmacology and Experimental Therapeutics, and the American Society for Cell Biology. He has served on several editorial boards including the Journal of Cell Biology, Journal of Biological Chemistry, Molecular Pharmacology, Molecular Biology of the Cell, Cancer Research, and Human Gene Therapy. He has also been involved in initiating several training and mentoring initiatives at NIH for high school, undergraduate, graduate, medical, post-baccalaureate, and postdoctoral students.

As DDIR, Dr. Gottesman has created the NIH Academy (supporting post-baccalaureate students in the study of health disparities); the Graduate Partnerships Program (which permits graduate students to conduct thesis research at NIH); and loan repayment programs for biomedical researchers supported by NIH. He has institutionalized an intramural tenure-track, new career tracks for clinical investigators, new fellows' training programs, the NIH Intramural Database (providing online information about all researchers and research at NIH), and other career development programs to help prepare biomedical research leaders of tomorrow.

Wendy Baldwin, Ph.D.

Dr. Baldwin was appointed NIH deputy director for extramural research in February 1994, after serving in an acting capacity since June 1993. She was responsible for guiding the NIH institutes and centers in the development of policies for their extramural research and research training programs. She also managed—for NIH and PHS—programs aimed at protection of human subjects in research and the proper care and use of laboratory animals in scientific studies.

She has made significant scientific contributions, primarily in adolescent fertility, contraceptive practice, childbearing patterns, AIDS risk behaviors, and infant mortality. She has published widely and has served on many NIH panels and committees, including the panel on NIH research on antisocial, aggressive, and violence-related behaviors, as well as the NIH advisory committee on women's health issues.

Dr. Baldwin joined NIH in 1973 as a health scientist administrator with NICHD. In 1979 she became chief of NICHD's Demographic and Behavioral Sciences Branch in the Center for Population Research. She was named deputy director of NICHD in 1991, a post she held until her appointment as NIH deputy director for extramural research.

She earned her Ph.D. in demography in 1973 and her M.A. in 1970 from the University of Kentucky. She received her B.A. from Stetson University in 1967.

Among her professional activities, she served as a temporary advisor to the WHO task force for social science research on reproductive health, on a National Academy of Sciences panel on adolescent pregnancy, and on a scientific advisory committee for demographic and health sciences. She is a past member of several editorial boards.

Dr. Baldwin has received many professional awards from PHS, NIH, and outside organizations.

Anthony L. Itteilag

Mr. Itteilag was NIH deputy director for management and chief financial officer, NIH, from January 1996 to October 2001.

Mr. Itteilag began his Federal career as a management intern in the Navy Department in 1964. After positions at Navy and at ACTION, in 1975 he became Chief of the Budget Branch in the U.S. Public Health Service (PHS). In 1978 he became the Director of the Division of Budget Policy and Management for the Department of Health and Human Services (DHHS).

From 1980 to 1984, he was Deputy Assistant Secretary for Budget, DHHS, and from 1984 to 1990 he was Director of Budget at the Department of the Interior.

In 1991 Mr. Itteilag became the Deputy Assistant Secretary for Health (Management and Budget), PHS, DHHS. He held that position through 1995.

Mr. Itteilag has a B.A. (summa cum laude) from the University of Rhode Island. He is the recipient of numerous awards including the Clifford R. Gross Award for Federal Public Service, American Society for Public Administration, (Maryland Chapter) in 2001; the Presidential Rank Award (Distinguished Senior Executive) in 1983 and 1992 and (Meritorious Senior Executive) in 1982 and 1988; the Department of the Interior Distinguished Service Award in 1991; the HHS Distinguished Service Award in 1981, 1997 (group) and 2001 (group); and the Public Health Service Exemplary Service Award in 1976. In 1980 he was corecipient of the Secretary's Exceptional Achievement Award, HHS.

He also is a member of the American Society for Public Administration, the American Association for Budget and Program Analysis, the American Political Science Association, the Federal Executive Institute Alumni Association, and the Senior Executives Association.

Mr. Itteilag has been a Senior Advisor to the NIH Director since October 2001.

Yvonne Thompson Maddox, Ph.D.

Dr. Yvonne Thompson Maddox was named Acting Deputy Director, NIH in January 2000 and continued to serve in that role until May 20, 2002. In this position, she guided the organizations and programs within the Office of the Director, NIH and was a chief advisor to the Acting Director, NIH. In addition, Dr. Maddox is the Deputy Director of the National Institute of Child Health and Human Development (NICHD), a position she has held since 1995.

Dr. Maddox received her B.S. in biology from Virginia Union University, Richmond and a Ph.D. in Physiology from Georgetown University. Following completion of the Ph.D., she served as a National Research Service Award (NRSA) Post Doctoral Fellow and as an Assistant Professor of Physiology in the Department of Physiology and Biophysics at Georgetown. She studied as a Visiting Scientist at the French Atomic Energy Commission, Saclay, France, and is a graduate of the Senior Managers in Government Program of the Kennedy School of Government, Harvard University.

Dr. Maddox came to NIH in November 1985 as a health scientist administrator in the National Institute of General Medical Sciences (NIGMS), where she managed the Congressionally mandated clinical and basic research grants program in trauma and burn injury. Following her initial appointment, she served NIGMS in various capacities: Acting Director, Minority Access to Research Careers (MARC) Program; Chief, Pharmacology and Physiological Sciences Section; and Deputy Director, Biophysics and Physiological Sciences Program.

In January 1995, Dr. Maddox joined NICHD as its Deputy Director. At the NICHD, Dr. Maddox manages the institute's diverse extramural program that supports research on population issues, reproductive biology, contraception, pregnancy, child development, nutrition, developmental biology, AIDS, mental retardation, and medical rehabilitation.

During her career at NIH, Dr. Maddox has received numerous honors and awards, including the Presidential Meritorious Executive Rank Award, the Public Health Service Special Recognition Award and the NIH Director's Award. She is a member of the American Physiological Society and serves on several public service and academic boards, including the Center for Development and Population Activities Advisory Board and the Robert Woods Johnson Health Policy Fellowship Advisory Board.

Dr. Maddox is author or coauthor of a number of scientific articles, book chapters and conference proceedings, including the often-cited paper on a method she developed to extract peritoneal macrophages from peritoneal dialysate, "A routine clinical source of peritoneal macrophages and their release of prostaglandins *in vitro*," which was published in 1984. She has delivered more than 100 lectures.

Charles E. Leasure, Jr.

Mr. Leasure was named NIH deputy director for management on October 7, 2001. He also served as NIH's chief financial officer and was acting executive officer for the Office of the Director, NIH, from 2000 to 2004.

Mr. Leasure began his career at NIH in 1965 as an employee management relations specialist in the Office of the Director. From 1966 to 1974 he held various administrative positions with the National Cancer Institute.

In 1974, Mr. Leasure became the associate director for administration at the National Institute of Allergy and Infectious Diseases. In 1984, he was named associate director for management at the National Institute of Environmental Health Sciences. He left that position in 1998 to become the associate director for management at the National Human Genome Research Institute.

Mr. Leasure has served as chair of the Administrative Training Committee that oversees the Presidential Management Intern Program, and as a member of the NIH-wide Leadership Development Committee. He has mentored NIH employees in several programs, including the Management Cadre Program, the Presidential Management Intern Program, and the Leadership Development Program.

Mr. Leasure has a B.A. from Georgetown University. He is also the recipient of the NIH Director's Award in 1996 and 2000 for his "outstanding efforts to improve the quality of life for NIH employees." He received the Presidential Meritorious Rank Award in 1994.

Raynard S. Kington, M.D.

Dr. Kington served as the Principal Deputy Director of NIH from February 9 2003, to October 2008 and again from August 2009 to August 2010. He served as Acting NIH Director from October 31, 2008, until the appointment of Dr. Francis S. Collins on August 17, 2009. During his tenure as Acting NIH Director, Dr. Kington led the agency through the development of NIH's plan for the use of the $10.4 billion American Recovery and Reinvestment Act resources designed to accelerate biomedical

science and the economy. In July 2009, NIH published the final "NIH Guidelines for Human Stem Cell Research" under his directorship. Dr. Kington resumed his role as Principal Deputy Director on August 17, 2009. Prior to his present appointment, Dr. Kington was Director of the Office of Behavioral and Social Sciences Research (2000-2003). In addition to this role, from January 2002 to November 2002, he served as Acting Director of the National Institute on Alcohol Abuse and Alcoholism.

Before coming to NIH, Dr. Kington was Director of the Division of Health Examination Statistics at the National Center for Health Statistics (NCHS) of the Centers for Disease Control and Prevention (CDC). As Division Director, he also served as Director of the National Health and Nutrition Examination Survey (NHANES), one of the nation's largest studies to assess the health of the American people. Prior to coming to NCHS, he was a Senior Scientist in the Health Program at the RAND Corporation. While at RAND, Dr.Kington was a Co-Director of the Drew/RAND Center on Health and Aging, a National Institute on Aging Exploratory Minority Aging Center.

Dr. Kington attended the University of Michigan, where he received his B.S. with distinction and his M.D. He subsequently completed his residency in Internal Medicine at Michael Reese Medical Center in Chicago. He was then appointed a Robert Wood Johnson Clinical Scholar at the University of Pennsylvania. While at the University of Pennsylvania, he completed his M.B.A. with distinction and his Ph.D. with a concentration in Health Policy and Economics at the Wharton School and was awarded a Fontaine Fellowship. He is board-certified in Internal Medicine and Public Health and Preventive Medicine. In 2006, Dr. Kington was elected to membership in the Institute of Medicine of the National Academy of Sciences.

Dr. Kington's research has focused on the role of social factors, especially socioeconomic status, as determinants of health. His research has included studies of the health and socioeconomic status of black immigrants, demographic correlates of the willingness to participate in genetic research, the relationship between wealth and health status, the health status of U.S. Hispanic populations, and the determinants of health care services utilization.

Norka Ruiz Bravo, Ph.D.

Dr. Ruiz Bravo began her tenure as NIH deputy director for extramural research on November 16, 2003, after her appointment was announced by the Director of NIH on October 30, 2003. She oversees the NIH external grants and awards program—a portfolio totaling approximately 83% of the NIH budget—providing trans-NIH coordination and directing the development of policies, standards, guidelines, and staff training for extramural research.

A biologist by training, Dr. Ruiz Bravo earned her Ph.D. degree in 1983 from Yale University. Her postdoctoral tour included completion of an NSRA Fellowship that began at the Johns Hopkins University and ended at the University of Texas M.D. Anderson Cancer Research Center in the fields of biochemistry and molecular biology. She then held a research faculty position at the M.D. Anderson Cancer Research Center and a tenure-track faculty position at Baylor College of Medicine.

In 1990, Dr. Ruiz Bravo joined the NIH as a scientific review administrator in the National Institute of General Medical Sciences (NIGMS) Office of Review Activities. During the years that followed, she actively pursued and was appointed to numerous special assignments. Some of these included: acting deputy director, NIGMS Division of Minority Opportunities in Research; special assistant, NIGMS Office of Extramural Activities; and, scientific review administrator at the National Center for Human Genome Research. She was concurrently a program director in the Division of Genetics and Developmental Biology, where she managed an active portfolio of grants in the field of transcriptional mechanisms.

In early 1997, Dr. Ruiz Bravo transferred her scientific, managerial, and administrative expertise to the National Cancer Institute (NCI), where she served as deputy director and then acting director for the Division of Cancer Biology.

She returned to the NIGMS in late 1999 as deputy associate director for extramural activities, and in 2000 was appointed associate director for extramural activities. In this role, Dr. Ruiz Bravo oversaw the $1.7 billion (FY2003) NIGMS budget for research, and research training grant programs supporting basic biomedicine. She was a principal advisor to the NIGMS director, providing counsel for strategic planning, development, and management of Institute grant activities.

Involved in leadership activities trans-NIH, Dr. Ruiz Bravo currently chairs the Extramural Program Management Committee, co-chairs the Extramural Activities Working Group, and is a member of the Information Technology Working Group. The Working Groups are subcommittees of the NIH Director's Steering Committee, the NIH's governance body. Formerly, she participated in a variety of service committees, chaired the Office of Research Services Advisory Committee, was the chair and co-founder of the Extramural Information Systems Advisory Group at NCI and chaired the Staff Training in Extramural Programs Committee. In addition to her trans-NIH leadership activities, Dr. Ruiz Bravo co-chairs the National Science and Technology Council's (NSTC) Subcommittee on Research Business Models, a trans-agency group tasked with facilitating research by harmonizing policies and regulations across the government. She is a former member of the NSTC's Working Group on Aligning Mechanisms with Scientific Opportunity. Dr. Ruiz Bravo is a member of the American Association for the Advancement of Science, the American Society for Cell Biology, and the Society for Developmental Biology.

Colleen Barros, M.A.

Ms. Barros received her M.A. in Public Administration from American University and has served in a variety of Federal administrative positions with special expertise in managing technical and scientific information systems and in R&D management. She began her career with NIH in 1979 as a Budget Analyst and served as Senior Administrative Officer in the NIH Office of the Director. In that position she was responsible for directing the efforts in establishing several new offices such as the Office of AIDS Research, the Office of Human Genome Research, the Office of Research on Minority Health, and the Office of Alternative Medicine.

In 1995, Ms. Barros was selected as the Associate Director for Administration in the National Institute on Aging where she received several awards for her outstanding contributions toward improving the administrative operations of both the NIH and the NIA. In addition, she participated in several trans-NIH committees and projects including serving on the NIH Information Technology Central Committee responsible for advising the NIH Director on NIH information technology issues and as the NBRSS Project Leader responsible for the development and implementation of NIH's new business system.

In February of 2004, Ms. Barros joined the Office of the Director again as she took on the role of Acting Deputy Director for Management until May 30th, when she was appointed Deputy Director for Management.

Her honors include the 2008 Presidential Rank of Distinguished Executive Award, the 2003 Presidential Rank of Meritorious Executive Award, and 4 NIH Director's Awards.

Alan Krensky, M.D.

Dr. Krensky is the first Director of the Office of Portfolio Analysis and Strategic Initiatives (OPASI) and a Deputy Director of the National Institutes of Health. For the past 23 years, he was at Stanford University where he served as the Shelagh Galligan Professor of Pediatrics, Associate Dean for Children's Health, Associate Chair for Research, Chief of the Division of Immunology and Transplantation Biology and Executive Director of the Children's Health Initiative. A medical graduate of the University of Pennsylvania in 1977, he trained in pediatrics and nephrology at Boston Children's Hospital and immunology with Steven Burakoff at the Dana-Farber Cancer Institute. After one year on the faculty at Harvard, he moved to Stanford as Assistant Professor of Pediatrics in 1984. He was appointed Shelagh Galligan Professor in 1995 and has been at NIH since July 8, 2007.

Dr. Krensky is a member of the American Society of Clinical Investigation, Association of American Physicians, Society for Pediatric Research, American Pediatric Society, American Society of Nephrology, American Society of Pediatric Nephrology, American Association of Immunologists and Transplantation Society. He has served as Councilor and President of the Society for Pediatric Research and Councilor and Secretary-Treasurer of the American Society of Nephrology. He has served on several Scientific Advisory Boards and holds nine patents. Dr. Krensky is a past recipient of the Society for Pediatric Research Young Investigator Award, American Society for Histocompatibility and Immunogenetics Young Investigator Award, American Society of Nephrology Young Investigator Award, American Academy of Pediatrics Award for Excellence in Pediatric Research, E. Mead Johnson Award for Research in Pediatrics, and Novartis Established Investigator Award of the American Society of Transplantation. He presented the David Cornfeld Lecture at Children's Hospital of Philadelphia, the David Hume Lecture at the American Society of Transplant Surgeons, the Roche Visiting Professorship at Harvard Medical School, the Robert Haslam Lecture at the Hospital for Sick Children, and the John Capp Clark lecture at the University of Pennsylvania. He has been supported by the American Heart Association Clinician-Scientist and Established Investigator Awards, the Medical Foundation Fellowship, the Joseph A. Shankman Award of the National Kidney Foundation of Massachusetts, Basil O'Connor Award of the March of Dimes, Mellon Foundation Fellowship, Burroughs Wellcome Scholar in Experimental Therapeutics and a MERIT Award from the National Institutes of Health.

As Executive Director of the Children's Health Initiative and Associate Dean for Children's Health at Stanford, Dr. Krensky planned and implemented a $500 million investment in preeminence and sustainability of the Lucile Packard Children's Hospital at Stanford. He helped develop six centers of excellence, five multidisciplinary cores, and the recruitment of more than forty faculty. In this role, he chaired the CHI Executive Committee, was involved in fund raising and served as a liaison between the Lucile Packard Foundation for Children's Health, Lucile Packard Children's Hospital and Stanford University School of Medicine. During his tenure, the endowment of the Packard Children's Hospital increased 500%.

Dr. Krensky's research program was continuously funded by the National Institutes of Health from 1984 to his assumption of the NIH post. He has made important contributions to understanding the role of human T lymphocytes in human disease and applying this information to the development of new diagnostic and therapeutic approaches to disease. He first identified the human lymphocyte function-associated antigens (1-3), the chemokine RANTES, the host defense molecule Granulysin, and the transcription factor KLF-13 (RFLAT-1). He has published more than 250 scientific articles and reviews and has served on the editorial boards of the Journal of Immunology (Associate Editor), Current Opinion in Pediatrics (Section Editor), Pediatric Nephrology (Assistant Editor), Journal of the American Society of Nephrology (Associate Editor), Pediatric Transplantation, Graft, and Annual Review of Medicine. Dr. Krensky has trained more than 46 graduate students and post-doctoral fellows in his laboratory and has a special interest in training undergraduate and high school students.

Dr. Krensky has enjoyed long service with several organizations, serving as Chairman of the Experimental Immunology Study Section at the National Institutes of Health, American Heart Association National Peer Review Group, American Cancer Society Institutional Review Group, Medical Advisory Board of the National Kidney Foundation of Northern California, the Burroughs Wellcome Fund Translational Research Advisory Committee, and the Steering Committee of the Immune Tolerance Network (NIH-JDRF).

Sally J. Rockey, Ph.D.

Dr. Rockey is the Deputy Director for Extramural Research, leading extramural research activities at NIH. The Office of Extramural Research (OER), which she also serves as Director, is the focal point for policies and guidelines for extramural research administration within NIH and in partnership with the biomedical research community.

Dr. Rockey received her Ph.D. in Entomology from Ohio State University, and has spent the majority of her career in the area of extramural research administration and information technology. She leads or is active on a number of Federal committees related to science, research administration, and electronic government and collaborates closely with academic and scientific communities.

In 1986 she joined the U.S. Department of Agriculture's Extramural Research arm, where she quickly rose to the post of Deputy Administrator for the Competitive Research Grants and Award Management Unit of the Cooperative State Research, Education, and Extension Service, overseeing the extramural grants process and portfolio. In 2002, she became Chief Information Officer, applying her breadth of government knowledge to IT, aligning state-of-the-art information technologies with the department's goals and objectives. In 2005, Dr. Rockey was appointed to the position of Deputy Director of OER within the Office of the Director at NIH to bring her extensive experience in research administration and federal assistance to the biomedical research community. She assumed the role of Acting NIH Deputy Director for Extramural Research on October 31, 2008, and became permanent in that position on August 15, 2010.

Dr. Rockey is a skilled public speaker, giving countless presentations on extramural research priorities and policies, grantsmanship, the competitive peer review process, scientific integrity, and IT.

Along with her many professional accomplishments, such as receiving the Presidential Rank Award in 2004, Dr. Rockey is an active member of the community and has numerous outside interests. She encouraged the science education of young children by giving presentations on insects to local elementary schools, where she was known as the "Bug Doctor."

Lawrence A. Tabak, D.D.S., Ph.D.

Dr. Tabak is the principal deputy director of the National Institutes of Health (NIH). He previously served as the acting principal deputy director of NIH (2009), and prior to that as director of the National Institute of Dental and Craniofacial Research from 2000-10.

Dr. Tabak has provided leadership for several trans-NIH activities, including the NIH Roadmap effort to support team science, the NIH Director's initiative to enhance peer-review, and the NIH's implementation of the American Recovery and Reinvestment Act. Most recently, he co-chaired working groups of the Advisory Committee to the Director of NIH on the Diversity of the Biomedical Research Workforce and Information Technology and Informatics.

Prior to joining NIH, Dr. Tabak was the senior associate dean for research and professor of dentistry and biochemistry & biophysics in the School of Medicine and Dentistry at the University of Rochester in New York. A former NIH MERIT recipient, Dr. Tabak's major research focus has been on the structure, biosynthesis and function of glycoproteins. He continues work in this area, maintaining an active research laboratory within the NIH intramural program in addition to his administrative duties.

Dr. Tabak is an elected member the Institute of Medicine of the National Academies. He received his undergraduate degree from City College of New York, his D.D.S. from Columbia University, and a Ph.D. from the University of Buffalo.

Kathy Hudson, Ph.D.

Dr. Kathy Hudson was appointed as the Deputy Director for Science, Outreach, and Policy (DDSOP) in April 2010. She currently serves as an *ex-officio* member of the NIH Advisory Council's Working Group for Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative. This working group is part of a broader government, foundation, and industry neuroscience initiative to understand and map the human brain.

Dr. Hudson works closely with and oversees the activities of the Associate Directors for Communications and Public Liaison, for Legislative Policy and Analysis, and for Science Policy. Dr. Hudson works closely with the NIH leadership to develop and implement new strategic and scientific initiatives; and she represents the NIH–and the NIH Director–in high-level collaborations and negotiations with the Department of Health and Human Services (HHS) and its components, with other Federal agencies, and with the White House Office of Science and Technology Policy. She works with congressional members and their staff to establish collaborative efforts for implementing new NIH initiatives. Equally important are the partnerships she forms with private research institutions, patient advocacy organizations, and professional societies in order to advance the NIH mission to enhance public health.

In September 2012, Dr. Hudson conceptualized and brought to fruition a Celebration of Science event. This day-long event, held at the NIH campus, brought together researchers and patients to highlight advances in biomedical research and how that progress directly affects patients.

From December 2011 through December 2012, Dr. Hudson served as the Acting Deputy Director of the National Center for Advancing Translational Sciences (NCATS). The NCATS mandate is to streamline the way translational research is done. She lead the many activities of bringing the Center into being and getting its programs underway. During her tenure, NCATS created two new research programs that rely on cross-sector partnerships to develop new tools that would enable others to bring safe and effective diagnostics, devices and therapeutics to the public. Dr. Hudson hosted a series of webinars to keep stakeholders updated on NCATS, and she coordinated a workshop that engaged stakeholders to discuss how policy research and analysis can inform translational research.

Dr. Hudson's professional experience includes serving as the NIH Chief of Staff; the Assistant Director of the National Human Genome Research Institute, NIH; and the founder and Director of the Genetics and Public Policy Center, John Hopkins University (JHU). Also at JHU, Dr. Hudson was an Associate Professor in the Berman Institute of Bioethics, Institute of Genetic Medicine, Department of Pediatrics.

Dr. Hudson holds a Ph.D. in Molecular Biology from the University of California at Berkeley, an M.S. in Microbiology from the University of Chicago, and a B.A. in Biology from Carleton College.

James M. Anderson, M.D., Ph.D.

Dr. James Anderson was appointed as the Deputy Director for Program Coordination, Planning, and Strategic Initiatives, and Director of the Division of Program Coordination, Planning, and Strategic Initiatives, on September 27, 2010. Prior to joining NIH, Dr. Anderson was Professor and Chair of the Department of Cell and Molecular Physiology in the School of Medicine at the University of North Carolina at Chapel Hill, a position he held since 2002. Before his appointment at Chapel Hill, he was Professor of Medicine and Cell Biology and Chief, Section of Digestive Diseases, at the Yale School of Medicine. Dr. Anderson has extensive clinical experience in both Internal Medicine and Hepatology, and he is considered among the top authorities in the world in his primary research field of tight junctions and paracellular transport. Dr. Anderson will continue his research of the paracellular barrier in a laboratory located in the intramural research program of the National Heart, Lung, and Blood Institute. He has been a principal investigator on NIH grants for almost twenty years. With experience in clinical medicine, in academic research, and in administration, Dr. Anderson has a broad understanding of the biomedical research spectrum that will inform his work with the NIH community in evaluating, prioritizing, and coordinating a wide range of trans-NIH research opportunities. Dr. Anderson graduated from Yale University in 1974, received his Ph.D. in Biology from Harvard University in 1979, and his M.D. from Harvard Medical School in 1983.

This page last reviewed on August 1, 2013

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Associate Directors

Diane Frasier, Associate Director for Administration
Jack E. Whitescarver, Ph.D., Associate Director for AIDS Research
Neil K. Shapiro, J.D., M.B.A., Associate Director for Budget
Francis Patrick White, Associate Director for Legislative Policy and Analysis
Robert M. Kaplan, Ph.D., Associate Director for Behavioral and Social Sciences Research
John T. Burklow, Associate Director for Communications and Public Liaison
David M. Murray, Ph.D., Associate Director for Disease Prevention
Alfred C. Johnson, Ph.D., Associate Director for Research Services
Janine A. Clayton, M.D., Associate Director for Research on Women's Health
Amy Patterson, M.D., Associate Director for Science Policy
Roger I. Glass, M.D., Ph.D., Associate Director for International Research

CHRONOLOGY OF ASSOCIATE DIRECTORS

Name	In Office from	To
Norman H. Topping	1948	1952
David E. Price	December 1, 1950	January 30, 1952
James A. Shannon	December 1, 1952	July 31, 1955
C.J. Van Slyke	December 1, 1952	December 2, 1958
Joseph E. Smadel	May 1, 1956	June 30, 1960
Kenneth M. Endicott	January 6, 1958	June 30, 1960
Jack Masur	July 1, 1960	March 8, 1969
Charles V. Kidd	September 13, 1960	December 9, 1964
Ernest M. Allen	August 10, 1960	January 8, 1963
Martin M. Cummings	July 11, 1963	January 1, 1964
John F. Sherman	January 1, 1964	October 31, 1968
Robert Q. Marston	February 1, 1966	March 31, 1968
Thomas J. Kennedy, Jr.	August 8, 1968	August 31, 1974
R.W. Lamont-Havers	November 3, 1968	October 1, 1972
Richard L. Seggel	January 4, 1969	November 28, 1971
Leonard D. Fenninger	November 10, 1969	May 4, 1973
Thomas C. Chalmers	February 9, 1970	October 20, 1973
Storm Whaley	July 1, 1970	February 3, 1992
Leon M. Schwartz	February 6, 1972	June 30, 1979
Thomas E. Malone	November 26, 1972	March 24, 1977
Leon Jacobs	July 30, 1972	July 3, 1978
Robert S. Gordon, Jr.	November 7, 1974	September 1, 1975
Joseph G. Perpich	February 15, 1976	December 12, 1981
Mortimer Lipsett	August 29, 1976	June 30, 1982
Seymour Perry	January 3, 1978	March 1980

William F. Raub	April 4, 1978	April 2, 1983
Charles U. Lowe (Acting)	January 3, 1980	July 9, 1982
Edwin D. Becker	March 1980	April 1988
Calvin Baldwin	August 1, 1980	January 31, 1986
Mark S. Beaubien (Acting)	July 1, 1982	January 18, 1984
Jay R. Shapiro (Acting)	July 1, 1982	July 1983
J. Richard Crout	July 12, 1982	April 16, 1984
Michael I. Goldberg	November 28, 1982	September 17, 1984
Philip S. Chen, Jr.	July 3, 1982	July 29, 1983
John L. Decker	August 1, 1983	June 1, 1990
Craig K. Wallace	January 19, 1984	February 8, 1991
George Galasso	February 5, 1984	January 2, 1996
Jay Moskowitz	January 1986	April 1993
John D. Mahoney	June 1986	April 1993
William T. Friedewald	November 1986	August 31, 1991
Itzhak Jacoby (Acting)	July 10, 1987	December 1999
Anthony S. Fauci	April 5, 1988	1994
Norman D. Mansfield	October 10, 1988	February 1992
John Ferguson (Acting)	September 1989	June 19, 1991
James D. Watson	October 1, 1989	April 10, 1992
Saul Rosen (Acting)	June 1990	June 1994
Ruth Kirschstein	September 1990	September 1991
William R. Harlan	June 30, 1991	April 30, 2001
Vivian Pinn	September 1991	August 31, 2011
Stephen A. Ficca	February 1992	March 2004
R. Anne Thomas	April 14, 1996	April 21, 2002
William E. Paul	March 1994	November 21, 1997
Leamon Lee	July 10, 1994	January 2004
John Ruffin	August 26, 1990	January 9, 2001
Diane Wax	May 1995	October 1998
Norman Anderson	July 1995	March 2000
Lana Skirboll	August 1995	April 30, 2010
Sue Quantius	September 1999	April 2002
Marc Smolonsky	July 1999	May 2009
Raynard Kington	October 2000	February 2003
Jack E. Whitescarver	October 20, 2000	Present
Barnett Kramer	May 6, 2001	September 2012
Donald Poppke	April 17, 2002	September 26, 2003
John T. Burklow	April 22, 2002	Present
Richard Turman	October 9, 2003	July 22, 2005
Andy Baldus (Acting)	July 23, 2005	October 2006
Diane Frasier	January 23, 2006	Present
Roger I. Glass	May 2006	Present
John Bartrum	October 15, 2006	December 2009
Alfred C. Johnson	October 29, 2006	Present
Christine Bachrach (Acting)	April 7, 2008	March 2010
Roz Gray (Acting)	May 2009	February 28, 2010
Louise Myers (Acting)	December 2009	April 2, 2010
Francis Patrick White	March 1, 2010	Present
Deborah Olster (Acting)	March 2010	February 1, 2012

Mark Rotariu (Acting)	April 3, 2010	September 2010
Neil K. Shapiro	September 2010	Present
Amy Patterson	January 16, 2011	Present
Janine A. Clayton	September 2011	Present
Robert M. Kaplan	February 1, 2012	Present
David M. Murray	September 23, 2012	Present

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National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Department of Health and Human Services*

Kathleen Sebelius, Secretary, HHS

CHRONOLOGY OF HHS SECRETARIES

Name	In Office from	To
Oveta Culp Hobby	April 11, 1953	July 31, 1955
Marion B. Folsom	August 1, 1955	July 31, 1958
Arthur S. Flemming	August 1, 1958	January 1, 1961
Abraham A. Ribicoff	January 20, 1961	July 13, 1962
Anthony J. Celebrezze	July 31, 1962	August 17, 1965
John W. Gardner	August 18, 1965	February 29, 1968
Wilbur J. Cohen	May 9, 1968	January 19, 1969
Robert H. Finch	January 22, 1969	June 24, 1970
Elliot L. Richardson	June 24, 1970	January 29, 1973
Caspar W. Weinberger	February 12, 1973	August 10, 1975
David Mathews	August 8, 1975	January 20, 1977
Joseph A. Califano, Jr.	January 26, 1977	July 19, 1979
Patricia Roberts Harris	July 27, 1979	January 19, 1981
Richard S. Schweiker	January 22, 1981	February 3, 1983
Margaret M. Heckler	March 9, 1983	December 12, 1985
Otis R. Bowen	December 13, 1985	January 20, 1989
Louis Sullivan	March 1, 1989	January1993
Donna Shalala	January 22, 1993	January 19, 2001
Tommy G. Thompson	February 2, 2001	January 25, 2005
Mike Leavitt	January 26, 2005	January 20, 2009
Kathleen Sebelius	April 28, 2009	present

*Name changed from Department of Health, Education, and Welfare on May 14, 1980; separate Department of Education formed.

This page last reviewed on February 22, 2011

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Nobel Laureates

Dozens of NIH-supported scientists from around the world have received Nobel Prizes for their groundbreaking achievements in Physiology or Medicine; Chemistry; Physics; and Economic Sciences. To date, 144 NIH supported researchers have been sole or shared recipients of 85 Nobel Prizes. Among these are individuals who have served as NIH staff scientists.

Laureates	Field	Year	Supporting NIH Institute(s)
Martin Karplus, U.S.A. & France, Michael Levitt, U.S.A., and **Arieh Warshel, U.S.A.**	Chemistry	2013	NEI, NIGMS, NCI
James E. Rothman, U.S.A., Randy W. Schekman, U.S.A., and **Thomas C. Südhof, U.S.A.**	Physiology or Medicine	2013	NIGMS, NIAMS, NIDDK, NCI, NHGRI, NIMH, NINDS, NHLBI
Robert J. Lefkowitz, U.S.A., and **Brian K. Kobilka, U.S.A.**	Chemistry	2012	NHLBI, NINDS, NIGMS, NIDA
Bruce A. Beutler, U.S.A., Jules A. Hoffmann, U.S.A., and **Ralph M. Steinman, U.S.A.**	Physiology or Medicine	2011	NIAID, NIDDK, NIGMS, NCI
Ei-ichi Negishi, U.S.A. *(shared with R. F. Heck, U.S.A. and A. Suzuki, Japan)*	Chemistry	2010	NIGMS
Thomas A. Steitz, U.S.A., Ada E. Yonath, Israel, and **Venkatraman Ramakrishnan, U.K.**	Chemistry	2009	NIGMS, NIAID, NCRR
Elizabeth H. Blackburn, U.S.A., Carol W. Greider, U.S.A., and **Jack W. Szostak, U.S.A.**	Physiology or Medicine	2009	NIGMS, NCI, NIDCR, NIA
Martin Chalfie, U.S.A., Roger Y. Tsien, U.S.A., and **Osamu Shimomura, U.S.A.**	Chemistry	2008	NIGMS, NINDS, NIAID, NIA, NEI
Mario R. Capecchi, U.S.A., and **Oliver Smithies, U.S.A.** *(shared with M. J. Evans, U.K.)*	Physiology or Medicine	2007	NIGMS, NHLBI, NIDDK, NCI, NICHD
Roger D. Kornberg, U.S.A.	Chemistry	2006	NIGMS, NIAID, NCI
Andrew Z. Fire, U.S.A., and **Craig C. Mello, U.S.A.**	Physiology or Medicine	2006	NIGMS, NICHD
Robert H. Grubbs, U.S.A., and **Richard R. Schrock, U.S.A.** *(shared with Y. Chauvin, France)*	Chemistry	2005	NIGMS
Richard Axel, U.S.A., and **Linda B. Buck, U.S.A.**	Physiology or Medicine	2004	NIDCD, NCI, NIAID, NIMH, NINDS, NIDDK
Irwin A. Rose, U.S.A., and **Avram Hershko, Israel** *(shared with A. Ciechanover, Israel)*	Chemistry	2004	NIAMS, NCI, NIAAA, NIGMS, NIDDK
Roderick MacKinnon, U.S.A., and **Peter Agre, U.S.A.**	Chemistry	2003	NHLBI, NEI, NIAAA, NIGMS, NCRR, NINDS, NIDDK
Paul C. Lauterbur, U.S.A. *(shared with P. Mansfield, U.K.)*	Physiology or Medicine	2003	NCRR, NCI, NHLBI, NIGMS, NIMH
John B. Fenn, U.S.A. *(shared with K. Tanaka, Japan and K. Wüthrich, Switzerland)*	Chemistry	2002	NIGMS
H. Robert Horvitz, U.S.A. *(shared with S. Brenner, U.S.A. and J.E. Sulston, U.K.)*	Physiology or Medicine	2002	NIGMS, NCI, NICHD
Leland H. Hartwell, U.S.A. *(shared with P.M. Nurse and R.T. Hunt, U.K.)*	Physiology or Medicine	2001	NIGMS, NCI, NCRR

K. Barry Sharpless, U.S.A. *(shared with W.S. Knowles, U.S.A. and R. Noyori, Japan)*	Chemistry	2001	NIGMS, NHLBI
Paul Greengard, U.S.A., and **Eric R. Kandel, U.S.A.** *(shared with A. Carlsson, Sweden)*	Physiology or Medicine	2000	NIMH, NIA, NIDA, NIGMS, NINDS, NIAAA, NHLBI, NIAMS, NCRR
James J. Heckman, U.S.A. and **Daniel L. McFadden**	Economic Sciences	2000	NIA, NICHD, NIMH
Günter Blobel, U.S.A.	Physiology or Medicine	1999	NIGMS, NCI
Robert Furchgott, U.S.A., Louis Ignarro, U.S.A., and **Ferid Murad, U.S.A.**	Physiology or Medicine	1998	NIAMS, NICHD, NIDDK, NIGMS, NHLBI, NINDS
Paul D. Boyer, U.S.A. and **Jens C. Skou, Denmark**	Chemistry	1997	NIGMS, NIDDK, NINDS
Stanley B. Prusiner, U.S.A.	Physiology or Medicine	1997	NINDS, NIA, NCRR, NIGMS
Peter C. Doherty, U.S.A., and **Rolf M. Zinkernagel, Switzerland**	Physiology or Medicine	1996	NIAID
Edward B. Lewis, U.S.A., and **Eric F. Wieschaus, U.S.A.** *(shared with C. Nusslein-Volhard, Germany)*	Physiology or Medicine	1995	NICHD, NIGMS
Alfred G. Gilman, U.S.A., and **Martin Rodbell, U.S.A.**	Physiology or Medicine	1994	NIEHS, NIDDK, NIGMS, NINDS
George A. Olah, U.S.A.	Chemistry	1994	NCI, NIGMS
Phillip A. Sharp, U.S.A., and **Richard Roberts, U.K.**	Physiology or Medicine	1993	NIGMS, NCI, NIAID, NCRR, NLM, NCHGR
Robert W. Fogel, Ph.D.	Economic Sciences	1993	NIA
Kary B. Mullis, U.S.A., and **Michael Smith, Canada**	Chemistry	1993	NHBLI, NIAID, NIGMS
Edwin G. Krebs, U.S.A., and **Edmond H. Fischer, U.S.A.**	Physiology or Medicine	1992	NIDDK, NIGMS, NIAMS
Gary Becker, U.S.A.	Economics	1992	NICHD
Elias J. Corey, U.S.A.	Chemistry	1990	NIGMS, NCRR, NCI, NHLBI, NIAID
E. Donnall Thomas, U.S.A., and **Joseph E. Murray, U.S.A.**	Physiology or Medicine	1990	NIAID, NCI, NHLBI, NIAID, NIDDK
Sidney Altman, U.S.A., and **Thomas Cech, U.S.A.**	Chemistry	1989	NCI, NIGMS, NICHD
J. Michael Bishop, U.S.A, and **Harold E. Varmus, U.S.A.**	Physiology or Medicine	1989	NCI, NIAID
Susumu Tonegawa, Japan	Physiology or Medicine	1987	NIAID
Donald J. Cram, U.S.A. *(shared with C.J. Pedersen, U.S.A., and J.-M Lehn, France)*	Chemistry	1987	NIGMS
Stanley Cohen, U.S.A., and **Rita Levi-Montalcini, U.S.A./Italy**	Physiology or Medicine	1986	NICHD, NIGMS, NIMH, NINDS
Herbert A. Hauptman, U.S.A. *(shared with J. Karle, U.S.A.)*	Chemistry	1985	NIGMS, NIADDK, NHLBI, DRR
Michael S. Brown, U.S.A., and **Joseph L. Goldstein, U.S.A.**	Physiology or Medicine	1985	NHLBI, NIGMS, DRR
R. Bruce Merrifield, U.S.A.	Chemistry	1984	NIDDK
Henry Taube, U.S.A.	Chemistry	1983	NIGMS
Sune Bergstrom, Sweden, and **John R. Vane, U.K.** *(shared with B. Samuelsson, Sweden)*	Physiology or Medicine	1982	NHLBI, NLM, NICHD, DRG, NIGMS, NIMH
Aaron Klug, U.K.	Chemistry	1982	NIAID
Roald Hoffmann, U.S.A. *(shared with K. Fukui, Japan)*	Chemistry	1981	NIGMS
David H. Hubel, U.S.A., and **Torsten N. Wiesel, U.S.A./Sweden** *(shared with R. W. Sperry, U.S.A.)*	Physiology or Medicine	1981	NEI, NIGMS, NINDS, DRR
Paul Berg, U.S.A., and **Walter Gilbert, U.S.A.** *(shared with F. Sanger, U.K.)*	Chemistry	1980	NIGMS, NCI, NIDDK
Baruj Benacerraf, U.S.A., George D. Snell, U.S.A., and **Jean Dausset, France**	Physiology or Medicine	1980	NIAID, NCI
Herbert C. Brown, U.S.A. *(shared with G. Wittig, W. Germany)*	Chemistry	1979	NIGMS

Hamilton O. Smith, U.S.A., and **Daniel Nathans, U.S.A.** *(shared with W. Arber, Switzerland)*	Physiology or Medicine	1978	NIGMS, NIAID, NCI
Roger C. L. Guillemin, U.S.A., and **Andrew V. Schally, U.S.A.** *(shared with R. S. Yalow, U.S.A.)*	Physiology or Medicine	1977	NIDDK, NICHD, DRR, NIGMS
D. Carleton Gajdusek, U.S.A., and **Baruch S. Blumberg, U.S.A.**	Physiology or Medicine	1976	NINDS, NHLBI, NCI
William N. Lipscomb, U.S.A	Chemistry	1976	NIGMS, DRG
David Baltimore, U.S.A., Renato Dulbecco, U.S.A., and **Howard M. Temin, U.S.A.**	Physiology or Medicine	1975	NIAID, NCI
Albert Claude, Belgium, George E. Palade, U.S.A., and **Christian de Duve, Belgium**	Physiology or Medicine	1974	NCI, NHLBI, NICHD, NIGMS, NHLBI, NIA
Gerald M. Edelman, U.S.A. and **Rodney R. Porter, U.K.**	Physiology or Medicine	1972	NIAID, NIDDK, NIAID, NICHD
Christian B. Anfinsen, U.S.A., Stanford Moore, U.S.A., and **William H. Stein, U.S.A.**	Chemistry	1972	NHLBI, NIDDK, NIGMS, NINDS
Earl W. Sutherland, Jr., U.S.A	Physiology or Medicine	1971	NIGMS, NHLBI, NIDDK
Julius Axelrod, U.S.A., and **Ulf von Euler, Sweden** *(shared with B. Katz, U.K.)*	Physiology or Medicine	1970	NHLBI, NIMH, NINDS
Luis Leloir, Argentina	Chemistry	1970	NIGMS, NIAID
Max Delbruck, U.S.A., Alfred D. Hershey, U.S.A., and **Salvador Luria, U.S.A.**	Physiology or Medicine	1969	NIAID, NIGMS, NCI, NICHD
Robert W. Holley, U.S.A., H. Gobind Khorana, U.S.A., and **Marshall W. Nirenberg, U.S.A.**	Physiology or Medicine	1968	NIGMS, NCI, NIAID, NHLBI
Lars Onsager, U.S.A.	Chemistry	1968	NIGMS
Haldan K. Hartline, U.S.A., and **George Wald, U.S.A.** *(shared with R. Granit, Sweden)*	Physiology or Medicine	1967	NINDS, NEI
Charles B. Huggins, U.S.A. *(shared with P. Rous, U.S.A.)*	Physiology or Medicine	1966	NCI, NIDDK, NIGMS
Jacques L. Monod, France *(shared with F. Jacob and A. Lwoff, France)*	Physiology or Medicine	1965	NIAID
Robert B. Woodward, U.S.A.	Chemistry	1965	NIGMS, NHLBI, DRG, NIDDK
Konrad Bloch, U.S.A. *(shared with F. Lynen, Germany)*	Physiology or Medicine	1964	NIGMS, NHLBI, DRG
James D. Watson, U.S.A. *(shared with F. H. C. Crick and M. H. F. Wilkins, U.K.)*	Physiology or Medicine	1962	NIGMS, NIDDK, NCI, DRR, NIAID
John C. Kendrew, U.K. *(shared with M. F. Perutz, U.K.)*	Chemistry	1962	NIDDK
Melvin Calvin, U.S.A.	Chemistry	1961	DRG, NCI
Peter B. Medawar, U.K. *(shared with F. M. Burnet, Australia)*	Physiology or Medicine	1960	NIAID
Arthur Kornberg, U.S.A., and **Severo Ochoa, U.S.A.**	Physiology or Medicine	1959	NIGMS, NIAID, NCI, NIDDK, NIA, DRG
George W. Beadle, U.S.A., Joshua Lederberg, U.S.A., and **Edward L. Tatum, U.S.A.**	Physiology or Medicine	1958	NIGMS, NHLBI, NIAID, NINDS, NICHD, DRR, NCI
Dickinson W. Richards, Jr., U.S.A. *(shared with A. Cournand, U.S.A., and W. Forssmann, Germany)*	Physiology or Medicine	1956	NIDDK, NCI, NHLBI, NIGMS
Vincent du Vigneaud, U.S.A.	Chemistry	1955	NHLBI, NCI, NIGMS, DRG
Thomas H. Weller, U.S.A. *(shared with J. F. Enders and F. C. Robbins, U.S.A.)*	Physiology or Medicine	1954	NIAID, NIGMS
Linus C. Pauling, U.S.A.	Chemistry	1954	NIGMS, NHLBI, DRG, NIAID, NCI
Fritz A. Lipmann, U.S.A. *(shared with H. A. Krebs, U.K.)*	Physiology or Medicine	1953	NIGMS, NCI
Philip S. Hench, U.S.A. *(shared with E. C. Kendall, U.S.A., and T. Reichstein, Switzerland)*	Physiology or Medicine	1950	NIGMS
E. O. Lawrence, U.S.A.	Physics	1939	NCI

NIH Scientists

1994 - Dr. Martin Rodbell, National Institute of Environmental Health Sciences, shared the Nobel Prize in Physiology or Medicine with Dr. G. Alfred Gilman of the University of Texas Southwestern Medical Center in Dallas, Texas. Dr. Rodbell dis- covered in 1970 that signal transmission requires a cellular molecule called GTP. In 1977 Dr. Gillman identified the proteins to which GTP binds and named them "G proteins." They are a family of proteins bound to the cell surface membranes that serve as intermediaries between incoming signals and cellular proteins that respond to these signals. Dr. Rodbell conducted this research while an intramural scientist with the National Institute of Arthritis and Metabolic Diseases (now NIDDK).

1976 - Dr. D. Carleton Gajdusek, National Institute of Neurological Disorders and Stroke, shared the Nobel Prize in Physiology or Medicine with Dr. Baruch S. Blumberg, of the Institute for Cancer Research in Philadelphia. They won the award for their discoveries concerning new mechanisms for the origin and dissemination of infectious diseases. Dr. Blumberg was at NIH (with the National Institute of Arthritis and Metabolic Diseases) in the 1960s, and did part of his prizewinning research at NIH.

1972 - Dr. Christian B. Anfinsen (formerly with the National Institute of Arthritis, Metabolism, and Digestive Diseases) won the Nobel Prize in Chemistry for his work "on ribonuclease, especially concerning the connection between the amino acid sequence and the biologically active conformation." Dr. Anfinsen provided the first clue to the structure of ribonuclease by demonstrating that it is comprised of a single polypeptide chain. He and his colleagues at Rockefeller University (with whom he shared the prize) demonstrated that the information required to fold the polypeptide chain of ribonuclease into the specific three-dimensional form of the active enzyme resides in the sequence of amino acids. Therefore, it became clear that this protein could be synthesized in the laboratory by joining the proper amino acids in the correct order and then allowing the chain of amino acids to fold spontaneously. This led to the first synthesis of an enzyme from chemicals in the laboratory. Such studies are basic to an understanding of normal life processes as well as of inherited metabolic diseases.

1970 - Dr. Julius Axelrod, National Institute of Mental Health, shared the Nobel Prize in Physiology or Medicine with two scientists from England and Sweden for independent research into the chemistry of nerve transmission. The three were cited for their "discoveries concerning the humoral transmitters in the nerve terminals and the mechanisms for their storage, release and inactivation." SpecDecember 2, 2013he action of the nerve transmitter, noradrenaline. He also demonstrated that some antidepressant drugs act by preventing the reuptake of noradrenaline and thus prolong its action in the brain.

1968 - Dr. Marshall W. Nirenberg, National Heart, Lung, and Blood Institute, shared the Nobel Prize in Physiology or Medicine for discovering the key to deciphering the genetic code. Dr. Nirenberg and two other researchers, working independently, with whom he shared the prize, made major advances in understanding the chemical mechanisms by which genetic language or information is translated into various proteins that determine the nature and characteristics of all living things. Dr. Nirenberg was the first NIH Nobelist and also the first federal scientist to receive a Nobel Prize.

This page last reviewed on December 2, 2013

National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Major NIH Lectures

The constant exchange of ideas is crucial to progress in medical research. Findings in one field often unexpectedly affect thinking in others. To encourage this exchange of ideas in its own laboratories, NIH hosts more than 1,200 scientific lectures each year by its own researchers and by distinguished visiting scientists from other research institutions. Here are a few highlights of the many lectures NIH hosted in 2012.

The NIH Director's Lectures
As part of NIH's Wednesday Afternoon Lecture Series, the Director's Lectures feature leading researchers from around the globe. Nominated by scientists and interest groups throughout NIH, the NIH Director specifically approves these annual lectures.

- IDH Mutations: Oncometabolite Deregulation of Epigenetic Remodeling—Craig B. Thompson, June 13, 2012. Videocast.
- Twenty-first Century Neuroscience: From Lab and Clinic to Home, School, and Office—Martha Farah, May 2, 2012. Videocast.
- Regenerative Medicine: Current Concepts and Changing Trends—Anthony Atala, January 25, 2012. Videocast.

R.E. Dyer Lecture
Established in 1950 in honor of former NIH director Dr. Rolla E. Dyer, a noted authority on infectious diseases. The lectureship, part of the Wednesday Afternoon Lecture Series, features internationally renowned researchers who have contributed substantially to medical as well as biological knowledge of infectious diseases.

- Working to End the HIV Pandemic: Glimmers of Hope—Myron S. Cohen, September 19, 2012. Videocast.
- Molecular Dialogues with the Microbiota: Insights from the Zebrafish Intestine—Karen Guillemin, February 8, 2012. Videocast.

Robert S. Gordon Lecture in Epidemiology
Named in honor of Robert S. Gordon, Jr., former Assistant Surgeon General of the U.S. Public Health Service and Special Assistant to former NIH Director James Wyngaarden, it is part of the Wednesday Afternoon Lecture Series. Topics focus on clinical research and epidemiology.

- The Obesity Epidemic: Why Have We Failed?—Lewis H. Kuller, February 15, 2012. Videocast.

George Khoury Lecture
Organized by NIH scientists to honor the memory of Dr. George Khoury, who was highly regarded as a superb scientist and caring mentor of the postdoctoral fellows in his laboratory. This annual lecture is part of the Wednesday Afternoon Lecture Series.

- Nuclear Damage and Miscounted Chromosomes: Human T Cell Leukemia Virus Transformation of Cells—Kuan-Teh Jeang, October 24, 2012. Videocast

Florence Mahoney Lecture on Aging
Sponsored by the National Institute on Aging and now part of the Wednesday Afternoon Lecture Series, the lecture recognizes Mrs. Mahoney's lifetime commitment to medical research and its benefits to people worldwide. Florence Stephenson Mahoney is widely known for her dedicated efforts in shaping national health science policy, particularly with respect to aging.

- Is aging reversible? Resetting the clock—Thomas A. Rando, September 12, 2012. Videocast.

G. Burroughs Mider Lecture

Established in 1968 in honor of the first NIH director of laboratories and clinics. The lecture, part of the Wednesday Afternoon Lecture Seriesis presented by an NIH intramural scientist to recognize and appreciate outstanding contributions to biomedical research.

- Genome Integrity and Cancer Prevention: Molecular Mechanisms of DNA Repair"—Wei Yang, February 22, 2012. Videocast.

Marshall W. Nirenberg Lecture

This lecture, established in 2011, recognizes Marshall Nirenberg for his work to decipher the genetic code, which resulted in his sharing the 1968 Nobel Prize in Physiology or Medicine. Nirenberg's career at the NIH spanned more than 50 years, and his later research focused on neuroscience, with particular emphasis on neural development. The Nirenberg lecture recognizes scientists who have made outstanding contributions to genetics and molecular biology.

- Evolution and Cancer—David Botstein, January 4, 2012. Videocast

Margaret Pittman Lecture

Part of the Wednesday Afternoon Lecture Series, the lecture is given by a researcher dedicated to advancing and improving the careers of women scientists. Since 1994 when this annual lecture began, every speaker has exemplified the intelligence, scientific excellence and drive that made Margaret Pittman a leader as the first female laboratory chief at NIH.

- Targeting Oncogenic Pathways in Head and Neck Cancer—Jennifer Grandis, December 12, 2012. Videocast.
- Computational Biology in the 21st Century: Making Sense out of Massive Data—Bonnie Berger, February 1, 2012. Videocast.

J. Edward Rall Cultural Lecture

The NIH Director's Cultural Lecture, part of the Wednesday Afternoon Lecture Series was renamed in 2008 in honor of Joseph "Ed" Rall, who helped to define NIH's modern intramural research program and, in the 1950s, to establish a stable academic-like community within a rapidly expanding government agency.

- That Used to Be Us: How America Lost Its Way and How We Find Our Way Back—Thomas L. Friedman, May 24, 2012. Videocast.

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National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Appropriations (Section 1)

Section 1 | Section 2

AMOUNTS IN THOUSANDS OF DOLLARS

FY	NCI[11]	NHLBI	NIDCR	NIDDK[1]	NINDS[2]	NIAID[12]	NIGMS	NICHD[3]	NEI	NIEHS[4]	NIA	NIAMS	NIDCD	NIMH[5]
1938	400													
1939	400													
1940	570													
1941	570													
1942	565													
1943	535													
1944	530													
1945	561													
1946	549													
1947	1,821													
1948	14,500													
1949	14,000													
1950	18,900	10,725	1,780											9,234
1951	20,086	14,200	1,955											14,200
1952	19,657	10,083	1,618											9,813
1953	17,887	12,000	1,650											10,474
1954	20,237	15,168	1,740	7,000	4,500	5,738								11,741
1955	21,737	16,668	1,990	8,270	7601	6,180								14,030
1956	24,978	18,898	2,176	10,840	9,861	7,775								18,052
1957	48,432	33,396	6,026	15,885	18,650	13,299								30,006
1958	56,402	35,936	6,430	20,385	21,387	17,400								38,457
1959	75,268	45,613	7,420	31,215	29,403	24,071								49,853
1960	91,257	62,237	10,019	46,862	41,487	34,054								67,470
1961	111,000	86,900	15,500	61,200	56,600	44,000								91,923
1962	142,836	132,912	17,340	81,831	70,812	56,091		3,036						107,711
1963	155,742	147,398	21,199	103,388	83,506	66,142		3,523						139,517
1964	144,340	132,404	19,689	113,679	87,675	68,723		(34,000)						170,990
1965	150,011	124,824	20,083	113,050	87,821	69,847		42,696						186,068
1966	163,768	141,462	23,677	123,203	101,153	77,987	127,188	55,024						226,588
1967	175,656	164,770	28,308	135,687	116,296	90,670	145,113	64,922		24,298				
1968	183,356	167,954	30,307	143,954	128,633	94,422	160,284	68,621		17,289				
1969	185,150	166,928	29,984	143,888	128,935	96,841	163,514	73,127		17,820				
1970	181,454	160,634	28,754	131,761	97,315	97,342	148,294	76,095	22,828	17,423				
1971	233,160	194,925	35,440	137,986	103,502	102,368	160,194	94,760	30,032	20,151				
1972	378,794	232,627	43,388	153,337	116,732	109,117	173,474	116,427	37,132	26,436				
1973	492,205	300,000	46,991	167,316	130,672	113,414	183,171	130,429	38,562	30,956				
1974	527,486	289,550	43,959	153,561	121,358	111,089	168,329	125,455	41,177	28,397				
1975	691,666	324,630	50,033	173,514	142,498	119,452	187,400	142,435	44,133	35,171				
1976	761,727	370,013	51,291	179,516	144,446	126,852	187,312	136,404	50,212	37,660	19,288			
1976 TQ	152,901	58,763	7,854	43,719	34,272	27,638	34,078	24,201	4,038	9,519	8,743			

1977	815,000	396,661	55,573	219,600	155,500	141,000	205,000	145,543	64,000	51,141	30,000			
1978	872,388	447,909	61,728	260,253	178,438	162,341	230,796	166,390	85,400	64,241	37,305			
1979	937,129	510,526	65,213	302,767	212,365	191,328	277,628	197,630	105,192	78,080	56,911			
1980	999,869	527,488	68,303	341,206	241,966	215,364	312,468	208,953	112,989	83,893	69,988			
1981	989,355	549,693	71,114	369,462	252,533	232,077	333,764	220,628	117,983	93,491	75,608			
1982	986,617	559,637	71,983	368,191	265,901	235,895	339,862	226,309	127,374	106,270	81,903			
1983	987,642	624,259	79,292	413,492	297,064	279,129	369,813	254,324	141,901	164,867	93,996			
1984	1,081,581	704,939	88,674	464,026	335,883	319,596	415,937	276,046	155,131	180,597	115,292			
1985	1,183,806	805,269	100,688	543,576	396,885	370,965	482,260	313,295	181,678	194,819	144,521			
1986	1,203,369	822,292	98,841	544,858	414,727	366,964	492,630	307,958	186,705	188,986	149,762			
1987	1,402,837	930,001	117,945	511,124	490,233	545,523	570,916	366,780	216,637	209,294	177,681	138,713		
1988	1,469,327	965,536	126,297	534,733	534,692	638,800	632,676	396,811	224,947	215,666	194,746	147,679		
1989	1,570,349	1,045,509	130,709	559,494	472,292	740,257	682,213	425,375	231,170	223,403	222,639	159,891	94,166	
1990	1,634,332	1,072,354	135,749	581,477	490,409	832,977	681,782	442,914	236,533	229,234	239,455	168,930	117,583	
1991	1,714,784	1,126,942	148,918	615,272	541,743	906,251	760,010	478,956	253,241	241,028	323,752	193,247	134,935	
1992	1,962,587	1,188,593	158,417	658,925	577,938	959,082	816,844	518,251	268,978	248,575	383,382	203,047	148,789	
1993	1,981,351	1,214,793	161,301	681,342	600,078	979,471	832,581	527,788	276,188	251,187	399,924	212,456	154,814	583,651
1994	2,082,267	1,277,880	169,520	716,054	630,650	1,065,593	875,511	555,195	290,260	264,249	420,303	223,280	162,823	613,444
1995	1,913,819	1,257,374	162,430	726,949	627,045	535,199	876778	512,165	291,095	266,566	431,991	228,176	166,660	542,200
1996	2,248,000	1,354,946	182,923	770,582	680,902	1,168,483	946,896	594,547	313,933	288,378	453,541	241,655	176,383	660,549
1997	2,381,149	1,432,529	195,825	815,607	726,407	1,256,659	998,387	631,365	332,597	308,487	485,806	257,003	188,345	701,107
1998	2,547,314	1,531,061	209,415	900,860	780,713	1,351,655	1,065,947	674,766	355,691	330,108	519,279	274,760	200,695	750,241
1999	2,925,247	1,792,509	234,183	1,020,559	902,680	1,569,063	1,197,026	750,485	395,595	375,494	596,126	307,960	229,735	860,638
2000	3,314,554	2,029,424	268,811	1,168,476	1,029,376	1,798,038	1,354,420	858,291	450,300	442,449	686,479	349,968	263,771	973,146
2001	3,754,456	2,298,512	306,211	1,399,684	1,175,854	2,042,124	1,535,378	975,766	510,352	564,810	785,590	396,460	300,418	1,106,305
2002	4,181,233	2,572,667	342,664	1,562,144	1,326,666	2,367,313	1,724,799	1,111,674	580,713	645,422	892,267	448,248	341,675	1,246,640
2003	4,592,348	2,793,733	371,636	1,722,730	1,456,476	3,706,722	1,847,000	1,205,927	633,148	697,767	993,598	486,143	370,382	1,341,014
2004	4,739,255	2,878,691	383,282	1,821,803	1,501,207	4,304,562	1,904,838	1,242,361	653,052	710,701	1,024,754	501,066	382,053	1,381,774
2005	4,825,258	2,941,201	391,829	1,863,584	1,539,448	4,402,841	1,944,067	1,270,321	669,070	724,347	1,051,990	511,157	394,260	1,411,933
2006	4,793,356	2,921,757	389,336	1,854,925	1,534,757	4,414,801	1,935,618	1,264,769	666,756	720,240	1,046,631	507,932	393,458	1,403,515
2007	4,797,639	2,922,929	389,703	1,855,868	1,535,545	4,417,208	1,935,808	1,254,707	667,116	721,119	1,047,260	508,240	393,668	1,404,494
2008	4,830,647	2,938,470	391,778	1,864,945	1,552,113	4,583,344	1,946,104	1,261,381	670,664	723,215	1,052,830	511,291	396,234	1,412,951
2009	4,968,973	3,015,689	402,652	1,911,338	1,593,344	4,702,572	1,997,801	1,294,894	688,480	740,894	1,080,796	524,872	407,259	1,450,491
2010	5,103,388	3,096,916	413,236	1,958,100	1,636,371	4,818,275	2,051,798	1,329,528	707,036	768,993	1,110,229	539,082	418,833	1,489,372
2011	5,058,577	3,069,723	409,608	1,942,224	1,622,003	4,775,968	2,033,782	1,317,854	700,828	762,778	1,100,481	534,349	415,155	1,476,294
2012	5,072,183	3,079,021	410,710	1,947,044	1,626,365	4,490,711	2,430,036	1,321,398	702,712	764,498	1,103,441	535,786	416,273	1,480,265

[1] Beginning in FY 1998, annual levels includes amounts received by the NIDDK consistent with the Special Statutory Funding Program for Type 1 Diabetes Research (special type 1 diabetes), unrelated to their annual appropriations, as initially authorized under Public Law (P.L.) 105-33 (now Section 330B of the Public Health Service Act) and subsequently re-authorized in 2001, 2007, 2008, 2010 and 2012. Between FY 1998-2000, NIDDK received $30.0 million in 'mandatory' budget authority each year followed by an increase to an annual level of $100.0 million for FY 2001 through FY 2003. Beginning in FY 2004 continuing through FY 2012, NIDDK has received budget authority of $150.0 million annually for special type 1 diabetes research purposes. For additional information, refer to the program and budget summary maintained by NIDDK at http://www.t1diabetes.nih.gov/about.shtml.

[2] Starting in 1970, excludes funds for blindness, established as a separate appropriation, the "National Eye Institute."

[3] Congress authorized the transfer of $34,000 from other NIH appropriations to establish the "National Institute of Child Health and Human Development." Starting in 1976, excludes funds for aging, established as a separate appropriation, the "National Institute on Aging."

[4] In FY 2001, NIH first received a separate appropriation to fund its participation in Superfund Research Program (SRP) activity performed at NIEHS. A significant change occurred in 2000 when Congress chose to provide funding support directly to NIEHS. Previously, the SRP received its funds as pass through dollars from the U.S. Environmental Protection Agency (EPA). From 2000-2005, jurisdiction for SRP funding was assigned to the House Veterans Affairs, Housing and Urban Development and Independent Agencies Appropriation Subcommittee. In 2005, both the House and Senate restructured their Appropriation subcommittees. As a result of this reorganization, budget review jurisdiction for the SRP was assigned to the Appropriation Subcommittee on Interior, Environment, and Related Agencies. A detailed breakdown of budget authority received annually for SRP is found at http://officeofbudget.od.nih.gov/approp_hist.html under the latest appropriations history table, e.g., [2000-2012].

[5] NIMH separated from NIH in 1967 and was raised to bureau status in PHS, became a component of PHS's Health Services and Mental Health Administration (HSMHA), later became a component of ADAMHA (successor organization of HSMHA), and rejoined the NIH in 1993.

[6] Funding for General Research and Services (GR&S) is shown for FY 1938 to FY 1962, at which time the Division of Research Facilities and Resources (DRFR) was established. In 1969, the Bureau of Health Manpower was renamed the Bureau of Health Professions Education and Manpower Training (BEMT). Within the BEMT, the

Division of Research Resources (DRR) was established. Functions of DRFR were transferred to this new Division. In 1970, DRR transferred out of this Bureau. Renamed the National Center for Research Resources in 1990.

[7] Starting in 1966, excludes funds for the newly established "National Institute of General Medical Sciences." Starting in 1970, excludes the "Office of International Operations," transferred to the "National Institute of Allergy and Infectious Diseases" and the "John E. Fogarty International Center for Advanced Study in the Health Sciences."

[8] Prior to 1970, funds were included under the National Institutes of Health Management Fund. Separate NIH appropriation enacted in 1970.

[9] Prior to 1970, Buildings and Facilities funds were included under PHS. Separate NIH appropriation enacted in 1970.

[10] "Office of AIDS Research."

[11] Includes amounts specified for facilities repairs and improvements at the National Cancer Institute--Frederick Federally Funded Research and Development Center in Frederick, MD. B&F, often referred to as NCI-Construction. A detailed breakdown of budget authority received for NCI-Construction is found at http://officeofbudget.od.nih.gov/approp_hist.html under the latest appropriations history table, e.g., [2000-2012].

[12] Between FY 2002 and FY 2011, the total includes amounts specified for the “Global Fund for HIV/AIDS, malaria, and tuberculosis” (Global Fund) to be transferred to another federal agency. As of FY 2012, NIAID no longer receives appropriations for Global Fund subject to transfer. A detailed breakdown of budget authority received for Global Fund transfer is found at http://officeofbudget.od.nih.gov/approp_hist.html under the latest appropriations history table, e.g., [2000-2012].

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National Institutes of Health (NIH), 9000 Rockville Pike, Bethesda, Maryland 20892

NIH...Turning Discovery Into Health®

U.S. Department of Health & Human Services

National Institutes of Health
Turning Discovery Into Health

Appropriations (Section 2)

Section 1 | Section 2

AMOUNTS IN THOUSANDS OF DOLLARS

FY	NIDA	NIAAA	NINR	NHGRI	NIBIB	NIMHD	NCRR[6,7]	NCCAM	NCATS	FIC	NLM	OD[8]	B&F[9]	OAR[10]	Total
1938							64								464
1939							64								464
1940							137								707
1941							141								711
1942							135								700
1943							743								1,278
1944							2,205								2,735
1945							2,274								2,835
1946							2,866								3,415
1947							6,254								8,075
1948							10,126								24,626
1949							14,540								28,540
1950							12,075								52,714
1951							14,314								64,755
1952							15,757								56,928
1953							16,599								58,610
1954							4,675								70,799
1955							4,675								81,151
1956							5,929								98,509
1957							12,122								177,816
1958							14,026								210,423
1959							28,974								291,817
1960							45,994								399,380
1961							83,900								551,023
1962							127,637								740,206
1963							159,826								880,241
1964							163,869								867,369
1965							164,759								959,159
1966							60,469								1,100,519
1967							68,534								1,014,254
1968							81,141			500					1,076,461
1969							84,810			600	18,160				1,109,757
1970							67,925			2,775	19,251	7,541	1,615		1,061,007
1971							66,320			3,666	21,440	8,903			1,212,847
1972							74,981			4,307	24,127	11,712	3,565		1,506,156
1973							75,073			4,666	28,568	12,042	8,500		1,762,565
1974							129,426			4,767	25,871	12,000	8,000		1,790,425
1975							127,200			5,589	28,850	17,326	3,000		2,092,897
1976							130,265			5,705	29,065	18,370	54,000		2,302,126
1976 TQ							20,282			1,135	6,572	4,642	750		439,107

1977							137,500			7,992	35,234	16,394	67,400		2,543,538
1978							145,095			8,483	37,619	18,900	65,650		2,842,936
1979							154,164			8,989	41,431	19,673	30,950		3,189,976
1980							169,196			8,987	43,979	21,036	3,250		3,428,935
1981							175,627			9,124	44,666	22,531	11,750		3,569,406
1982							184,177			9,205	45,035	23,618	9,898		3,641,875
1983							213,917			10,147	51,943	24,683	17,500		4,023,969
1984							243,177			11,336	49,613	26,720	25,040		4,493,588
1985							304,025			11,728	55,910	38,304	21,730		5,149,459
1986							292,523			11,054	55,322	111,961	14,259		5,262,211
1987			20,000				322,860			11,420	61,838	57,208	31,900		6,182,910
1988			23,380				368,153			15,651	67,910	61,819	47,870		6,666,693
1989			29,133				358,076			15,790	73,731	72,076	38,492		7,144,765
1990			33,513	59,538			353,734			15,516	81,861	107,419	61,042		7,576,352
1991			39,722	87,418			335,255			17,519	91,408	95,651	168,687		8,274,739
1992			44,929	104,762			314,213			19,593	99,088	141,854	103,840		8,921,687
1993	403,806	176,619	48,119	106,239			312,468			19,733	113,031	190,325	108,731		10,335,996
1994	425,201	185,617	51,018	128,701			331,915			21,677	119,981	233,605	111,039		10,955,783
1995	290,029	181,150	48,164	151,518			284,693			14,646	125,303	217,882	114,120	1,333,570	11,299,522
1996	458,112	198,401	55,814	169,768			390,298			25,292	140,936	261,072	146,151		11,927,562
1997	489,160	211,870	59,721	189,529			415,095			26,557	150,828	286,810	200,000		12,740,843
1998	527,175	227,175	63,597	217,704			453,883			28,289	161,185	296,373	206,957		13,674,843
1999	602,874	259,575	69,788	264,707			554,446			35,402	181,189	306,356	197,519		15,629,156
2000	685,781	292,369	89,522	335,527			676,557	68,390		43,494	214,068	282,000	165,376		17,840,587
2001	780,833	340,453	104,328	382,112		130,096	817,253	89,138		50,482	246,351	211,800	153,790		20,458,556
2002	886,718	383,615	120,366	428,758	111,861	157,563	1,011,262	104,451		56,859	276,091	235,113	204,600		23,321,382
2003	961,721	416,051	130,584	464,995	278,279	185,714	1,138,821	113,407		63,465	300,135	266,232	628,687		27,166,715
2004	990,953	428,669	134,724	479,073	287,129	191,471	1,179,058	116,978		65,382	317,315	327,504	88,972		28,036,627
2005	1,006,419	438,277	138,072	488,608	298,209	196,159	1,115,090	122,105		66,632	315,146	358,046	110,288		28,594,357
2006	1,000,029	435,930	137,342	486,049	296,810	195,405	1,099,101	121,465		66,378	314,910	478,066	81,081		28,560,417
2007	1,000,621	436,259	137,404	486,491	296,887	199,444	1,133,240	121,576		66,446	320,850	1,046,901	81,081		29,178,504
2008	1,006,022	438,579	138,207	489,368	300,233	200,630	1,155,560	122,224		66,912	322,667	1,111,735	118,966		29,607,070
2009	1,032,759	450,230	141,879	502,367	308,208	205,959	1,226,263	125,471		68,691	330,771	1,246,864	125,581		30,545,098
2010	1,059,848	462,346	145,660	516,028	316,582	211,572	1,268,896	128,844		70,051	339,716	1,177,300	100,000		31,238,000
2011	1,050,542	458,286	144,381	511,497	313,802	209,714	1,257,754	127,713		69,436	336,733	1,166,963	49,900		30,916,345
2012	1,053,367	459,519	144,769	512,873	338,357	276,440		128,057	575,366	69,622	337,639	1,459,117	125,344		30,860,913

[1] Beginning in FY 1998, annual levels includes amounts received by the NIDDK consistent with the Special Statutory Funding Program for Type 1 Diabetes Research (special type 1 diabetes), unrelated to their annual appropriations, as initially authorized under Public Law (P.L.) 105-33 (now Section 330B of the Public Health Service Act) and subsequently re-authorized in 2001, 2007, 2008, 2010 and 2012. Between FY 1998-2000, NIDDK received $30.0 million in 'mandatory' budget authority each year followed by an increase to an annual level of $100.0 million for FY 2001 through FY 2003. Beginning in FY 2004 continuing through FY 2012, NIDDK has received budget authority of $150.0 million annually for special type 1 diabetes research purposes. For additional information, refer to the program and budget summary maintained by NIDDK at http://www.t1diabetes.nih.gov/about.shtml.

[2] Starting in 1970, excludes funds for blindness, established as a separate appropriation, the "National Eye Institute."

[3] Congress authorized the transfer of $34,000 from other NIH appropriations to establish the "National Institute of Child Health and Human Development." Starting in 1976, excludes funds for aging, established as a separate appropriation, the "National Institute on Aging."

[4] In FY 2001, NIH first received a separate appropriation to fund its participation in Superfund Research Program (SRP) activity performed at NIEHS. A significant change occurred in 2000 when Congress chose to provide funding support directly to NIEHS. Previously, the SRP received its funds as pass through dollars from the U.S. Environmental Protection Agency (EPA). From 2000-2005, jurisdiction for SRP funding was assigned to the House Veterans Affairs, Housing and Urban Development and Independent Agencies Appropriation Subcommittee. In 2005, both the House and Senate restructured their Appropriation subcommittees. As a result of this reorganization, budget review jurisdiction for the SRP was assigned to the Appropriation Subcommittee on Interior, Environment, and Related Agencies. A detailed breakdown of budget authority received annually for SRP is found at http://officeofbudget.od.nih.gov/approp_hist.html under the latest appropriations history table, e.g., [2000-2012].

[5] NIMH separated from NIH in 1967 and was raised to bureau status in PHS, became a component of PHS's Health Services and Mental Health Administration (HSMHA), later became a component of ADAMHA (successor organization of HSMHA), and rejoined the NIH in 1993.

[6] Funding for General Research and Services (GR&S) is shown for FY 1938 to FY 1962, at which time the Division of Research Facilities and Resources (DRFR) was established. In 1969, the Bureau of Health Manpower was renamed the Bureau of Health Professions Education and Manpower Training (BEMT). Within the BEMT, the

Division of Research Resources (DRR) was established. Functions of DRFR were transferred to this new Division. In 1970, DRR transferred out of this Bureau. Renamed the National Center for Research Resources in 1990.

[7] Starting in 1966, excludes funds for the newly established "National Institute of General Medical Sciences." Starting in 1970, excludes the "Office of International Operations," transferred to the "National Institute of Allergy and Infectious Diseases" and the "John E. Fogarty International Center for Advanced Study in the Health Sciences."

[8] Prior to 1970, funds were included under the National Institutes of Health Management Fund. Separate NIH appropriation enacted in 1970.

[9] Prior to 1970, Buildings and Facilities funds were included under PHS. Separate NIH appropriation enacted in 1970.

[10] "Office of AIDS Research."

[11] Includes amounts specified for facilities repairs and improvements at the National Cancer Institute--Frederick Federally Funded Research and Development Center in Frederick, MD. B&F, often referred to as NCI-Construction. A detailed breakdown of budget authority received for NCI-Construction is found at http://officeofbudget.od.nih.gov/approp_hist.html under the latest appropriations history table, e.g., [2000-2012].

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