

CURRICULUM VITAE

NAME: Earl Reece Stadtman
DATE/PLACE OF BIRTH: November 15, 1919; Carrizozo, New Mexico, USA
MARITAL STATUS: Married; no children

EDUCATION:

1937 - Graduated from San Bernardino High School, San Bernardino, CA
1939 - Graduated from San Bernardino Valley College, San Bernardino, CA
1942 - B.S. - University of California, Berkeley (Soil Science)
1949 - Ph.D. - University of California, Berkeley (Comparative Biochemistry);
Thesis: Mechanisms of Fatty Acid Synthesis by Clostridium kluyveri

BRIEF CHRONOLOGY OF EMPLOYMENT:

1943-49 Research Assistant, Department of Food Technology, Division of Plant Nutrition, University of California
1948-49 Graduate Student, University of California
1949-50 Atomic Energy Commission Fellow with Fritz Lipmann, Biochemical Research Laboratory, Massachusetts General Hospital
1950-58 Chemist (Biochemistry), Laboratory of Cellular Physiology and Metabolism, National Heart Institute, National Institutes of Health (NIH)
1959-60 Sabbatical Leave (Max Planck Institute, Munich; September-March; Pasteur Institute, Paris, April-September)
1962-94 Chief*, Laboratory of Biochemistry, National Heart, Lung, and Blood Institute, NIH
1958-Present Chief*, Section on Enzymes, Laboratory of Biochemistry, National Heart Institute, NIH

* Appointed to ES-1320 on 07/13/79.

MILITARY SERVICE: None

SOCIETIES:

New York Academy of Sciences, 1950
American Society of Biological Chemists, 1951-present

December 18, 2003

Membership Committee, 1959-61
 Chairman, Committee Policy and Procedures, 1965-66
 Publication Committee, 1966-70
 Council, 1975-78; 1972-85
 President, 1982-83
 American Chemical Society, 1952-present
 Nominating Committee, 1962-64
 Chairman, Division of Biological Chemistry, 1963-64; 1981-82
 American Academy of Arts and Sciences, 1969
 Washington Academy of Sciences, 1957-75
 American Society for Microbiology, 1962-present
 National Academy of Sciences, 1969-present
 International Union of Biochemistry, 1967-present
 American Chemical Society Representative on U.S. National Committee
 U.S. Delegate to IUB Meeting in Hamburg, West Germany, 1976
 U.S. Delegate to IUB Meeting in Perth, Australia, 1982
 Council, 1976-82
 Executive Committee, 1982-84
 Chairman, Interest Group Committee, 1979-84
 Foundation for Advanced Education in the Sciences (FAES), Bethesda, MD, 1961-present
 Lecturer, Microbial Biochemistry, Regulation of Metabolism, 1961-present
 Faculty Chairman, Biochemistry, 1966-68
 Board of Directors, 1966-69
 Chairman, Education Committee, 1967-69
 Vice President, 1969-70
 Biophysical Society, 1977-present
 The Protein Society, 1986-present
 The Oxygen Club of Greater Washington, D.C., 1987-present
 The Oxygen Society, 1988-present
 Elected as Fellow
 Elected to membership on Society Council
 Gerontology Society, 1988-present
 International Society for Free Radical Research, 1988-present
 Elected to The Bavarian Academy of Sciences, 1996

ACADEMIC APPOINTMENTS:

1954-61 U.S. Department of Agriculture, Graduate School, Bethesda, MD
 1956-58 Lecturer, Biochemistry, Georgetown University, Washington, DC
 1958-79 Lecturer, Special Topics, Department of Microbiology Graduate School,
 University of Maryland, College Park, MD
 1966-Pres Professor of Biochemistry, Graduate Program, Johns Hopkins University-FAES
 1967 Visiting Professor of Biochemistry, Department of Chemistry, University of
 Illinois, Urbana, IL (George A. Miller Visiting Professor Program)
 1968 Burroughs-Wellcome Lecturer, Massachusetts General Hospital, Boston, MA

- 1968 Honors Program, New York University Medical Center, New York, NY
1969 Visiting Professor, Department of Chemistry, Pennsylvania State University,
University Park, PA
1973 Visiting Professor of Biochemistry, Battelle Research Center, University of
Washington, Seattle, WA
1975 Visiting Professor, West Virginia University, Morgantown, WV
1977 Visiting Professor, Department of Biochemistry and Molecular Biology, University of
Florida, Gainesville, FL
1980 Visiting Professor, Department of Biochemistry and Nutrition, University of North
Carolina at Chapel Hill, NC

LECTURESHIPS (special):

- 1954 Lecturer, Friends of the Kresge-Hooker Scientific Library
1963 University of Colorado (selected topics on intermediary metabolism)
1962-63 Lecturer in Biochemistry for the Southern Sections of the American Chemical Society
1966 University of Pisa, Italy (Course on Regulation of Metabolism)
1969 Regents Lecturer, University of California, Riverside Harvey Society Lecturer
1972 University of Camerino, Italy, Honored Lecturer in Course on Mechanism of
Enzymatic Regulation of Metabolism
1974 Lecturer, American Society for Microbiology
1975 Beckmann Lecturer, British Molecular Enzyme Meeting, Dundee, Scotland
1976 Plenary Lecturer, American Society of Biological Chemists, San Francisco, CA
1977 Scuola Superiore di Studi Universitari di Perfezionamento, Pisa, Italy (Course on
Metabolic Regulation)
1980 Distinguished Camille and Henry Dreyfus Lecturer, Northwestern University,
Evanston, IL
1982 Lecturer, Biochemical Society of the Republic of Korea
1985 Kamen Lecturer, University of California, San Diego, CA
1985 Distinguished Lectureship in Biochemistry, University of Maryland,
Baltimore, MD
1985 John Muntz Memorial Lecture, Albany Medical College of Union University, Albany, NY
1985 Oklahoma Medical Research Foundation Lecture, Oklahoma City, OK
1990 The Seventh Robert E. Olson Lecturer, St. Louis University, Department of Biochemistry,
St. Louis, MO
1992 1992 Nutrition Graduate Student Speaker, Davis, CA
1992 1992 Edmond Fischer Lecture in Biochemistry, University of Washington, Seattle, WA

NATIONAL AND INTERNATIONAL LECTURES:

Symposium on Some Aspects of Microbial Metabolism, Oak Ridge, TN, April 10-11, 1952. Title "The Enzymatic Synthesis of Acyl-Coenzyme A Compounds."

Symposium on the Mechanism of Enzyme Action, McCollum-Pratt Institute of Johns Hopkins University, Baltimore, MD, June 16-19, 1953. Title "On the Energy Rich Nature of Acetyl Imidazole, an Enzymatically Active Compound."

Symposium on Glutathione, Ridgefield, CN, November, 1953. Title "The Role of Sulfhydryl Compounds in Acyl-Transfer Reactions."

IV International Congress of Biochemistry, Vienna, Austria, 1958. Title "The Biosynthesis and Degradation of Riboflavin."

Sixth International Congress of Biochemistry, New York, NY, 1964. Title "Role of Vitamin B12 Derivatives in Anaerobic Metabolism."

Symposium on the Biosynthesis of Amino Acids, American Chemical Society Meeting, Cincinnati, OH, January 13-17, 1963. Title "End Product Regulation of Divergent Biosynthesis Pathways in Amino Acid Metabolism."

Pseudomonas Workshop, Cold Spring Harbor, NY, July 24-25, 1964.

Seminar on Metabolic Regulation, Kyoto, Japan, 1966 (U.S.-Japan Cooperative Science Program). Title "Cumulative Feedback Inhibition of Glutamine Synthetase in Microorganisms."

Third Annual Pathobiology Conference, Aspen, CO, August 8-17, 1966. Title "Allosteric Regulation of Divergent Metabolic Pathways."

Sixth Symposium on Regulation of Enzyme Activity and Synthesis in Normal and Neoplastic Tissues, Indiana University School of Medicine, Indianapolis, IN, October 2-3, 1967. Title "Cellular Regulation of Glutamine Synthetase Activity in *Escherichia coli*."

International Symposium on Vitamins and Nutrition, Honolulu, HI, 1967. Title "Metabolism of Keto Acids."

Alfred Benzon Symposium I on The Role of Nucleotide for the Function and Conformation of Enzymes, sponsored by the Danish Science Foundation, Copenhagen, Denmark, September 9-11, 1968. Title "On the Structure and Allosteric Regulation of Glutamine Synthetase from *Escherichia coli*."

Canadian Biochemical Society Symposium on The Role of Allosteric Enzymes in the Control of Metabolism, held in connection with the meeting of the Canadian Federated Society, Kingston, Canada, June 11-14, 1968. Title "Regulation of Glutamine Synthetase."

International Symposium on Interaction between Subunits of Biological Macromolecules, sponsored by the commission on Molecular Biophysics of the International Union for Pure and Applied Biophysics, Cambridge, England, June 24-27, 1968. Title "Relation of Subunit Structure to Catalytic Activity of Glutamine Synthetase."

Symposium on Control Mechanisms in Intermediary Metabolism, University of Miami, Miami, FL, January 20-24, 1969. Title "Relationship of Structure to the Regulatory Characteristics of *Escherichia coli* Glutamine Synthetase."

Eighth Symposium on Regulation of Enzyme Activity and Synthesis in Normal and Neoplastic Tissues, Indiana University School of Medicine, Indianapolis, IN, September 29-30, 1969. Title "Multiple Molecular Forms of Glutamine Synthetase Produced by Enzyme Catalyzed Adenylation and Deadenylation Reactions."

International Symposium on Metabolic Interconversion of Enzymes, Santa Margherita Ligure, Italy, May, 1970. Title "Regulatory Significance of Glutamine Synthetase Adenylylating and Deadenylylating Enzyme Systems in *Escherichia coli*."

Eighth International Congress of Biochemistry, Symposium on Biochemical Regulation and Control Systems, Switzerland, September 3-9, 1970. Title "Glutamine Synthetase."

Symposium on Molecular Basis of Biological Activity. First meeting of the Pan American Association of Biochemical Societies (PAABS), Caracas, Venezuela, July 11-17, 1971. Title "Regulation of Glutamine Metabolism in *Escherichia coli* by Enzymes Catalyzed Adenylation and Deadenylation of Glutamine Synthetase."

Symposium on Aspects of the Regulation of Metabolic Pathways by Small Molecules, 162nd American Chemical Society Meeting, Washington, DC, September 13-17, 1971. Title "Regulation of *Escherichia coli* Glutamine Synthetase by Enzyme Catalyzed Adenylation and Deadenylation Reactions."

Symposium on Control of Reactions in Living Cells, International Congress of Pharmaceutical Sciences, Washington, DC, September, 1971. Title "Regulation of Enzyme Activities."

Second International Symposium on Metabolic Interconversion of Enzymes Rottach-Egern, Germany, October 26-29, 1972. Title "The Mechanism of Action and Metabolic Control of the Multifunctional Enzyme Complex That Catalyzed Adenylation and Deadenylation of *Escherichia coli* Glutamine Synthetase."

Symposium Lecture, International Congress of Microbiology, Jerusalem, Israel, June, 1973. Title "Cascade Control of Glutamine Synthetase Activity in *Escherichia coli*."

164th American Chemical Society Meeting, Symposium on Enzymes of Glutamine Metabolism, New York, NY, August 28-September 1, 1973. Title "Central Role of Glutamine in Metabolism."

9th International Congress of Biochemistry, Symposium on Regulation of Protein Function, Stockholm, Sweden, July 1-6, 1973. Title "Metabolic Control of the Multifunctional Enzyme System That Catalyzes Adenylation and Deadenylation of *Escherichia coli* Glutamine Synthetase."

Third International Symposium on Metabolic Interconversion of Enzymes, Seattle, WA, June, 1973. Title "Uridylylation of the P_{II} Regulatory Protein in Cascade Control of *Escherichia coli* Glutamine Synthetase."

Symposium on Biochemical Control Mechanisms, St Marguerite, Quebec, Canada, February 25-March 1, 1973. Title "Cascade Control of Glutamine Synthetase Activity in *Escherichia coli*."

Fourth International Symposium on Metabolic Interconversion of Enzymes, Arad, Israel, April 27-May 1, 1974. Title "Metabolic Regulation of Coupled Covalent Modification of Cascade Systems."

Lipmann Symposium on Energy, Regulation and Biosynthesis in Molecular Biology, Berlin, West Germany, July 8-9, 1974. Title "Cascade Control of *E. coli* Glutamine Synthetase."

International Symposium on Enzymic Mechanisms in Biosynthesis and Cell Function in honor of Severo Ochoa's 70th Birthday, September 23-27, 1975.

Third International Conference on Isozymes, Multiple Molecular Forms of Enzymes Involved in the Regulation of Glutamine Synthetase, New Haven, CN, April 18-20, 1974.

Symposium on New Directions in Comparative Physiology and Biochemistry, American Society of Zoologists, Tucson, AZ, December 27-30, 1974. Title "Cascade Systems: Physiological Computers Programmed to Regulate Activities of Key Enzymes in Metabolism."

Dahlem Workshop on the Molecular Basis of Circadian Rhythms, Berlin, West Germany, November 3-7, 1975.

Symposium on Enzyme Regulation, Seville, Spain, March, 1975. Symposium on Enzymatic Mechanisms in Biosynthesis and Cell Function, Barcelona and Madrid, Spain, September 23-27, 1975.

Tenth International Congress of Biochemistry, Hamburg, West Germany, July 26-30, 1976. Title "Metabolic Regulation of Coupled Covalent Modification Cascade Systems."

Feodor Lynen Symposium, Munchen, West Germany, April 8-9, 1976.

Italian Society of Biophysics and Molecular Biology, October 23-25, 1977. Title "Importance of Interconvertible Enzyme Cascades in Regulation of Key Metabolic Processes."

The Neurosciences Fourth Study Program, Boulder, CO, June 20-July 1, 1977. Title "Advantages of Enzyme Cascades in Regulation of Key Metabolic Processes."

Tenth Miami Winter Symposium, Miami, FL, January, 1979. Title "Allosteric Control of *E. coli* Glutamine Synthetase Is Mediated by a Bicyclic Nucleotidylation Cascade System."

Symposium on Limited Proteolysis in Microorganisms, National Institutes of Health, Bethesda, MD, April 17-19, 1978. Title "Comments on Control of Enzyme Activities by Proteolysis."

Lipmann Symposium on Concepts of Chemical Recognition, Grignon, France, July 18-20, 1979. Title "Subunit Interactions of Adenylylated Glutamine Synthetase."

ICN-UCLA Symposia on Covalent and Noncovalent Modulation of Protein Function, Keystone, CO, February 26-March 2, 1979. Title "Metabolite Control of the Glutamine Synthetase Cascade."

Federation of European Biochemical Societies, Special Meeting on Enzymes, Dubrovnik-Cavtat, Yugoslavia, April 17-21, 1979. Title "Role of Enzyme Catalyzed Covalent Modifications in Regulation of Catalysis by E. coli Glutamine Synthetase."

Eleventh International Congress of Biochemistry, Symposium on Enzyme Modifications, Toronto, Canada, July 8-13, 1979. Title "Regulation of Glutamine Synthetase."

Italian Biochemical Society, Il Ciocco, Italy, September 26-28, 1979. Title "Nucleotide- dependent Interconvertible Enzyme Cascades in the Regulation of Key Metabolic Processes."

Conference on Novel ADP-Ribosylation of Regulatory Enzymes and Proteins, National Institutes of Health, Bethesda, MD, October 22-24, 1979. Title "Modification of Proteins."

Symposium on Glutamine: Metabolism, Enzymology and Regulation, Mansion Galindo, Mexico, November 25-28, 1979. Title "The Interconvertible Enzyme Cascade That Regulates Glutamine Synthetase Activity."

Symposium on Biological Cycles in honor of the 80th Birthday of Sir Hans Krebs, Dallas, TX, March 17-20, 1980. Title "International Enzyme Cycles in Cellular Regulation."

Thirteenth FEBS Meeting, Symposium on Enzyme Regulation, Jerusalem, Israel, August, 1980. Title "Metabolite Control of Glutamine Synthetase Adenylylation and Deadenylylation in Permeabilized Cells of E. coli."

Frontiers in Molecular Biology - A Symposium in Honor of the 75th Birthday of Severo Ochoa, Nutley, NJ, 1980. Title "Regulation of Glutamine Synthetase Degradation in E. coli."

International Titisee Conference on Metabolic Interconversion of Enzymes, Titisee, West Germany, 1980. Title "Regulation of Glutamine Synthetase Degradation."

Symposium on Biochemistry and Molecular Biology in honor of the 70th Birthday of David Shemin, Northwestern University, Evanston, IL, 1981. Title "Regulation of Glutamine Synthetase Breakdown."

Symposium on Enzyme Regulation in honor of the 65th Birthday of Sidney Colowick, Vanderbilt University, Nashville, TN, 1981. Title "Regulation of Glutamine Synthetase Degradation in E. coli."

Lecturer, Commemoration of the Inauguration of the Nitrogen Fixation Center, University of Mexico, Cuernavaca, Mexico, 1981. Title "The Regulation of Glutamine Synthetase Degradation in E. coli."

Symposium on Structural Basis and Dynamic Aspects of Linkage in Biological Macromolecules in honor of the 80th Birthday of J. Wyman, Mexico City, Mexico, 1981. Title "Cascade Systems in Cellular Regulation."

International Conference on Translational/Transcriptional Regulation of Gene Expression, Fogarty International Center, National Institutes of Health, Bethesda, MD, 1981. Chaired session on "Translational Regulation in Cells."

Seventh International Biophysics Congress and III Pan American Biochemistry Congress, Mexico City, Mexico, 1981.

Sixth International Meeting on Metabolic Interconversion of Enzymes, Florence, Italy, 1981. Title "Regulation of Enzyme Activities and Proteolysis by Mixed-Function Oxidase- catalyzed Modification Reactions."

Symposium Speaker and Plenary Lecturer in Workshop on Methods for the Study of Protein-Ligand Interactions, Camerino, Italy, 1981.

Workshop on the Role of Covalent Modification in the Control of Protein Synthetase, Moderator in Session on Translational Control, National Institutes of Health and the Uniformed Services University of the Health Sciences, Bethesda, MD, 1981.

Fourth International Conference on Cytochrome P₄₅₀: Biochemistry, Biophysics and Environmental Implications, Kuopio, Finland, June, 1982. Title "Inactivation of Key Metabolic Enzymes by P₄₅₀-linked Mixed-Function Oxidation Systems."

Gunsalus Symposium, University of Illinois, Evanston, IL, 1982. Title "Inactivation of Key Enzymes by Cytochrome P-450-linked Mixed-Function Oxidation Reactions."

International Symposium on Medical and Biological Aspects of Proteinase Inhibitors, Tokushima, Japan, 1982. Chaired session on Intracellular Proteinase Inhibitors: Their Medical and Biological Significance. Title "A Novel Protease in *E. coli* That Catalyzes the Degradation of Key Enzymes Following Their Inactivation by Mixed-Function Oxidation Systems."

IUB Biochemistry Congress and Official Delegate of the National Committee of the General Assembly, Perth, Australia, 1982. Title "Importance of Interconvertible Enzyme Cascades in the Regulation of Key Enzymes in Metabolism."

Discussion Meeting on the Biological Roles of Protein Phosphorylation at The Royal Society, London, England, 1982. Title "Protein Phosphorylation As a Regulatory Device."

7th International Symposium on Metabolic Interconversion of Enzymes, Avila, Spain, 1983. Title "Implication of Key Enzymes by Mixed-Function Oxidation Reaction: Possible Implication in Protein Turnover, Aging, and Oxygen Toxicity."

Symposium on Molecular Structure and Regulation in Biological Systems, A symposium to celebrate completion of the Biology Complex at Johns Hopkins University, Baltimore, MD, June, 1983. Title "Preeminence of Interconvertible Enzymes in Cellular Regulation."

Representative of the Biological Division of the American Chemical Society in the Delegation of American Biochemists to visit universities in the Peoples Republic of China, September 5-26, 1983.

Symposium on "Cellular Regulation and Malignant Growth" in honor of Professor Fritz Lipmann, Kawaguchi-Ko (Tokyo), Japan, May 24-28, 1984. Title "Oxidative Inactivation of Enzymes: Implication in Protein Turnover and Aging."

American Society of Biological Chemists Minisymposium on Impact of Aging on Biochemical Function, St. Louis, MO, June 5, 1984. Title "Age-Related Alterations of Enzymes May Involve Mixed-Function Oxidation Reactions."

NATO sponsored Conference and Workshop on "The Biology of Aging". Chaired session on "Structure and Function of Cytoplasmic Macromolecules and Cell Organelles in Relation to Aging", Aquafredda di Maratea, Italy, July 8-13, 1984.

Symposium on "Structure and Function of Macromolecules" in honor of Bernard L. Horecker, Roche Institute of Molecular Biology, Nutley, NJ, October 25-26, 1984. Title "Regulation of Enzyme Turnover."

National Foundation for Cancer Research and University of California Workshop on Oxygen Radicals and Cancer, University of California, Berkeley, CA, February 8-9, 1985. Title "Oxygen Radical Effects on Protein Turnover."

Conference on Oxygen Radicals, Pathology and Aging, University of California, San Diego, CA, February 16, 1985. Title "Oxidative Modification of Enzymes by Mixed-Function Oxidation Systems."

12th Annual Meeting of the Spanish Society of Biochemistry, Valencia, Spain, September, 1985. Title "Covalent Modification of Enzymes by Mixed-Function Oxidation."

Co-organizer Symposium on "The Role of Free Radical Mechanisms in Aging, XIII International Congress of Gerontology, New York, NY, July 1985.

8th International Conference on Metabolic Interconversion of Enzymes, Pitlochry, Perthshire, Scotland, May 1985. Title "Regulation of Glutamine Synthetase Activity and the Repression of Its Biosynthesis in *E. coli* Are Mediated by Two Nucleotidylation/Denucleotidylation Cycles."

U.S.-Japan Cooperative Cataract Research Group Meeting, Honolulu, HI, December 9-13, 1985. Title "Mixed-function Oxidation Reactions in Biological Systems."

Symposium on Control of Chemical Processes by Molecular Morphology in honor of Paul Weiss, 191st American Chemical Society, New York, April 1986. Title "Allosteric Regulation of Enzyme Catalysis."

Plenary Lecturer, Annual Meeting of the American Society of Biological Chemists, San Francisco, CA, 1976

International Symposium on "From Enzymology to Cellular Biology" in Commemoration of the 25th Year of the Creation of the Laboratory of Enzymology of the CNRS, Gif-sur-Yvette, France, May 1986. Title "Principles of Metabolic Regulation."

Invited Speaker, Rose Lecture, Chicago, IL, May 2, 1986. Title "Oxygen Radical-mediated Inactivation of Enzymes: Implication in Protein Turnover, Aging and Neutrophil Function."

Gordon Research Conference on "Proteolytic Enzymes and Their Inhibitors", Plymouth State College, NH, June 16-20, 1986. Title "Oxidative Modification of Proteins: A Regulatory Step in Protein Turnover."

Gordon Research Conference on "Enzymes, Co-enzymes and Metabolic Pathways", Meriden, NH, June 30-July 4, 1986. Title "Regulation of Enzyme Degradation."

16th Annual Meeting of the American Aging Association. Workshop on "Aspects of Cellular Aging", Washington, DC, September 25-27, 1986. Title "Enzymes and Aging."

Invited Speaker, Symposium on "Covalent Modification and Metabolic Regulation" in honor of Joe Larner, Charlottesville, VA, October 4-5, 1986. Title "The Regulation of Protein Turnover."

Invited Speaker, Annual Meeting of the Korean Biochemical Society, Chinju City, Korea, October 25-26, 1986. Title "Oxidation in Protein Turnover, Neutrophil Function, Ageing, and Oxygen Toxicity."

KAIST-NIH Joint Symposium on Life Sciences, Seoul, Korea, October 27-28, 1986. Title "Oxidation in Protein Turnover, Neutrophil Function, Ageing, and Oxygen Toxicity."

Commentor, Frontiers in Basic Sciences That Relate to Heart, Lung, and Blood Diseases, Symposium on Oxygen Free Radicals, NIH, Bethesda, MD, December 10-12, 1986. Subject: "NAD(P) Oxidase and Cytochrome b559."

Invited Speaker, NIH-Pasteur Centenary Symposium on the Impact of Molecular Biology on Biomedical Research: Session on "Prokaryotic Biochemistry and Molecular Biology", NIH, Bethesda, MD, May 26-28, 1987. Title "Cascade Control of Glutamine Synthetase Levels and Activity in *Escherichia coli*."

Invited Speaker, Fourth International Congress on Oxygen Radicals: Session on Peroxidation and Antioxidants, La Jolla, CA, June 27-July 3, 1987. Title "Implication of Protein Oxidation in Protein Turnover, Aging and Oxygen Toxicity."

Invited Speaker, XIV National Meeting of the Sociedad Espanola de Bioquimica, Symposium on Metabolic Regulation in honor of A. Sols, Benalmadena-Malaga, Spain, September 27-30, 1987. Title

"The Synthesis, Degradation and Catalytic Activity of *E. coli* Glutamine Synthetase Are Regulated by Bicyclic Cascade Systems."

Invited Speaker, Fritz Lipmann Memorial Symposium "The Roots of Modern Biochemistry," Berlin, Federal Republic of Germany, October 4-6, 1987. Title "Use of Pyrophosphate Bond Energy for the Regulation of Key Enzyme Activities via Interconvertible Enzyme Cascades."

Organizer/Participant, Symposium on Biochemical Foundations of Medical Research, NIH Centennial Celebration and Alumni Reunion, Bethesda, MD, October 15-18, 1987. Title "Oxygen Radical Mediated Inactivation of Enzymes: Biological Implications."

Invited Chair, International Titisee Conference on Signal Transduction and Phosphorylation; session on Protein Phosphatases, Titisee, Federal Republic of Germany, March 2-6, 1988.

Invited Keynote Lecturer, International Conference on Medical, Biochemical and Chemical Aspects of Free Radicals, Kyoto, Japan, April 9-13, 1988. Title "Oxygen Radical-mediated Inactivation of Enzymes: Biological Implications."

Invited Speaker, First EURAGE Molecular Biology Group Meeting on the Molecular Biology of Ageing, Herakleion, Crete (Greece), October 7-10, 1988.

Invited Speaker, American Physiological Society Meeting on "Growth, Development and Aging," Montreal, Canada, October 9-13, 1988.

Invited Designated After Dinner Speaker, Symposium on α -Keto Acid Dehydrogenase Complexes: Organization, Regulation, and Biomedical Aspects. A conference honoring Lester J. Reed, Austin, TX, November 16-18, 1988. Title "

Invited "Special Lecturer", Gordon Research Conference on Oxygen Radicals in Biology, Ventura, CA, February 6-10, 1989. Title "Protein Oxidation and Turnover."

Invited Visiting Professor, Institute of Gerontology, The University of Michigan, Ann Arbor, MI, March 14-15, 1989. Titles "Aging: By Chance or Design?" and "Metal-Catalyzed Oxidation of Proteins: Implications in Aging."

Invited Speaker, Jacques Monod Conference on "Twenty-five Years of Allostery," Roscoff, French Brittany, March 28-31, 1989. Title "Regulation of Glutamine Synthetase."

Invited Speaker, 3rd International Congress of Biochemical Gerontology, Acapulco, Mexico, June 16-17, 1989. Title "Role of Oxyradicals in Aging and Protein Turnover."

Invited "Special Lecturer", Gordon Research Conference on "Phagocytes," Plymouth, New Hampshire, June 25-30, 1989. Title "Mechanism of Oxidative Injury."

Invited Speaker, 5th Conference on Superoxide and Superoxide Dismutase, Jerusalem, Israel, September 17-22, 1989. Title "Role of O_2^- and Reducing Agents in the Presence of Metal Compounds on Aging."

Plenary Lecturer, International Symposium on Biological Oxidation Systems, Bangalore, India, October 23-26, 1989. Title "Implication of Metal Catalyzed Oxidation of Enzymes in Aging, Protein Turnover, and Oxygen Toxicity."

Invited Speaker, Satellite Symposium on Polyunsaturated Fatty Acids and Eicosanoids, Hyderabad, India, October 30-November 1, 1989. Title "Mn(II)-Bicarbonate Dependent Decomposition of H_2O_2 and Amino Acid Oxidation."

Invited Speaker, Centre for Cellular and Molecular Biology, Hyderabad, India, November 1, 1989. Title "Implication of Metal Catalyzed Oxidation of Enzymes in Aging, Protein Turnover, and Oxygen Toxicity."

Invited Speaker, Conference on Antioxidants and Degenerative Diseases, University of California at Berkeley, Berkeley, CA, January 26-29, 1990. Title "Mn(II)-Bicarbonate-Mediated Catalase-Like Activity and Amino Acid Oxidation" and "Mercaptan-Specific Antioxidant Protein."

Invited Speaker, to give the Seventh Robert E. Olson Lecture at St. Louis University, St. Louis, MO, March 15, 1990. Title "Oxygen Radical Mediated Protein Oxidation: Biological Implications."

Plenary Lecturer, Symposium on Molecular Mechanism of Aging, Seoul, Korea, April 23-24, 1990. Title "Oxygen Radical-Mediated Protein Modifications: Biological Implications."

Invited Speaker, University of Vermont Biochemistry Seminar Series, Burlington, VT, May 18, 1990. Title "Oxygen Radical-Mediated Protein Modifications: Biological Implications."

Invited Speaker, Wayne State University, Department of Pharmacology, Detroit, MI, May 15, 1990. Title "Oxygen Radical-Mediated Protein Modifications: Biological Implications."

Honored in a satellite Symposium on Cellular Regulation in celebration of the 70th Birthdays of T. C. and E. R. Stadtman at the ASBMB/AAI Annual Meeting, New Orleans, LA, June 3, 1990. Title "Oxidative Modification of Proteins--Biological Implications."

Invited Speaker, Symposium on "Ascorbic Acid: Biological Functions and Relationship to Cancer," Washington, DC, September 10-12, 1990. Title "Ascorbic Acid and Oxidative Inactivation of Proteins."

Invited Speaker, Symposium Honoring M. J. Coon, University of Michigan, Ann Arbor, MI, November 2-3, 1990. Title "Biological Consequences of Oxygen-Radical-Mediated Protein Damage."

Plenary Lecturer, 5th Biennial Meeting of the International Society for Free Radical Research, Symposium on Oxidative Damage and Repair, Pasadena, CA, November 14-20, 1990. Title "Protein Damage and Repair."

Invited Speaker, International Symposium on Oxygenases and Active Oxygen, Kyoto, Japan, December 10-12, 1990. Title "Metal Ion Catalyzed Protein Oxidation: Biological Consequences."

Invited Speaker (Opening Lecture), 4th Tutzing Symposium on Chemical Engineering in Medicine and Biotechnology "Defense and Detoxification on Cellular Level," Castle Tutzing, Lake Starnberg, Germany, February 25-28, 1991. Title "Metal Ion-Catalyzed and Ozone-Mediated Oxidation of Proteins."

Invited Speaker, Series on Tables Rondes Roussel-Uclaf "Stability of Proteins," Paris, France, June 13-14, 1991. Title "Metal Ion-Catalyzed Oxidation of Enzymes: Effect of Thermal Stability, Proteolytic Susceptibility and Biological Function."

Invited CoChairperson of Symposium on "Enzyme Regulation," 15th International Congress of Biochemistry, Jerusalem, Israel, August 4-9, 1991. Opening remarks.

Invited Speaker, The First International Conference on Amino Acid Research--Frontiers and New Horizons in 1991, Kyoto, Japan, August 13-19, 1991. Title "Regulation of Glutamine Synthetase in *E. coli*."

Invited Speaker, Conference on "Research Frontiers in Biochemistry," Stockholm, Sweden, September 9-11, 1991. Title "Glutamine Synthetase: Effects of Posttranslational Modification on Activity, Folding, and Degradation."

Invited Speaker, International Conference of Protein Modification in Signal Transduction, Island of Elba, Italy, September 14-19, 1991. Title "Role of Protein Oxidation in Protein Turnover."

Invited Speaker, Society for Free Radical Research Conference "Free Radicals and Aging," Paris, France, September 26-28, 1991. Title "Protein Modification in Aging."

Invited Speaker, International Conference on Antioxidants, Tarrytown, NY, October 8-10, 1991. Title "Age-Related Oxidative Reactions in Proteins."

Invited Speaker, The Robert A. Welch Foundation 1991 Conference of Chemical Research, Houston, TX, October 26-29, 1991. Title "Principles of Enzyme Regulation Derived from Studies on Glutamine Synthetase."

Invited Speaker, "1992 Nutrition Graduate Student Speaker" at the University of California, Davis, CA, March 23, 1992. Title "Protein Modification and Aging."

Invited Speaker, Annual Korean Society for Gerontology Spring Symposium "Aging and Diseases," Pusan, Korea, May 30, 1992. Title "Role of Protein Oxidation in Protein Turnover, Aging and Disease."

Invited Speaker, 1st IUB Conference "Biochemistry of Diseases"--Symposium on "Antioxidant Defense against Free Radical-Induced Pathology," Nagoya, Japan, June 1-6, 1992. Title "Free Radical-Induced Damage of Protein and Its Inhibition by Antioxidants."

Invited Speaker, 1992 35th Annual Meeting of the Canadian Federation of Biological Societies, Symposium on Molecular Aspects of Aging, Victoria, British Columbia, Canada, June 18-20, 1992. Title "Modification of Proteins with Aging."

Invited Speaker, Department of Pharmacology, University of Virginia, Charlottesville, September 10-11, 1992. Title "Protein Modification and Aging."

Invited Lecturer, to give the Edmond Fischer Lecture and Biochemistry Seminar, University of Washington, Seattle, WA, October 29-30, 1992. Title "Metal-Catalyzed Protein Oxidation in Aging and Disease."

Invited Speaker, 1993 Keystone Symposium on "Molecular Biology of Aging," Lake Tahoe, CA, March 19-25, 1993. Title "Modification of Protein by Ozone, Metal Ion-Catalyzed Reactions, and by Lipid Peroxidation Products."

Invited Speaker, 4th International Conference on Anticarcinogenesis & Radiation Protection: Mechanisms, Biomarkers, Molecular Diagnostics and Preventive Strategies, Baltimore, MD, April 18-23, 1993. Title "Protein Modification in Aging."

Invited Participant, "Scientific Workshop - FALS-SOD," Cambridge, MA, July 30 to August 1, 1993.

Invited Participant, 5th International Symposium on the Maillard Reaction, University of Minnesota, St. Paul, MN, August 29-September 1, 1993. Title "Protein Modification and Aging".

Invited Participant and Platform Lecturer, Meeting on the Molecular and Cellular Biochemistry of Oxidative Stress, Urbino, Italy, September 19-22, 1993. Title "Damage to Proteins Following Exposure to Reactive Oxygen Species".

Invited Participant, Research into Ageing Workshop, London, England, October 6, 1993. Title "Aging and Disease".

Invited Speaker, International Free Radical Pre-Satellite Symposium: Neurobiology of NO• and OH•, NIH Clinical Center, Lipsett Amphitheater, Bethesda, Maryland, November 7, 1993. Title "Antioxidant Defense Mechanisms".

Invited Participant, 10th Federation of Asian and Oceanian Biochemists Symposium on Protein Research, session on "Enzymes", Taipei, Taiwan, December 8-10, 1993. Title "Oxygen Free Radical Mediated Modification of Proteins".

Invited Participant, Dahlem Conference on Molecular Aspects of Aging, Berlin, Germany, February 13-18, 1994. Title "The Status of Oxidatively Modified Proteins as a Marker of Aging".

Invited Participant, First International Conference on Oxidative Stress and Aging, Kona, HI, March 22-26, 1994. Title "Protein Modification and Aging".

Invited to present a seminar at the Department of Biochemistry and Molecular Biology, Colorado State University, Ft. Collins, CO, April 4, 1994. Title "Free Radical Mediated Oxidation of Proteins".

Invited Participant, International Symposium on Oxidative Processes and Antioxidants, Cannes, France, April 8-9, 1994. Title "Protein Modification in Oxidative Stress".

Invited Participant, Conference on "The Biology of Aging - A Molecular Viewpoint", St. Louis University Health Science Center, St. Louis, MO, May 2-4, 1994. Title "Oxidative Damage to Proteins".

Invited Speaker, 39th Congress of the Italian Biochemical Society, Symposium "Molecular Mechanisms of Aging", Pavia, Italy, September 14-17, 1994.

Invited Speaker, International Symposium on Molecular Microbiology, Seoul, Korea, October 7-9, 1994. Title "Metal ion-catalyzed protein modification in oxidative stress, aging, and disease"

Participated in the Second International Congress on Vitamins and Biofactors in Life Science (ICBB), San Diego, CA, February 16-19, 1995.

Invited Participant at the symposium in honor of Lester Packer entitled "Electron Transfer from Energy Coupling to Aging", San Francisco, CA, March 21, 1995.

Invited Speaker, Annual Meeting of the Oxygen Club of California, San Francisco, CA, March 22-24, 1995. Title: Oxidants and Antioxidants in Biology.

Served on Program Committee and participated in the International Conference on Structure and Function of Regulatory Proteins, NIH, Bethesda, MD, April 19-21, 1995.

Attended the 8th Annual Spring Conference of The Oxygen Club of Greater Washington, DC, USUHS, Bethesda, MD, May 12, 1995.

Participated in the ASBMB/DBC-ACS Joint Meeting, San Francisco, CA, May 21-25, 1995.

Invited Speaker at symposium to honor Alton Meister, The New York Hospital-Cornell Medical Center, Cornell University Medical College, New York, NY, September 28, 1995.

Invited Speaker at symposium to honor Herb Weissbach, Roche Institute of Molecular Biology, Nutley, NJ, October 10-11, 1995. Title: Role of Oxygen Free Radical-Mediated Protein Damage in Aging and Disease.

Invited Lecture, "Protein Ageing and Alzheimer's Pathology", Ernst Schering Research Foundation Workshop "Alzheimer's Disease" Aetiological Mechanisms and Therapeutic Possibilities", Berlin, Germany, October 11-13, 1995.

Invited Speaker and Forum Discussant, 1995 American Osteopathic Association Research Conference, Orlando, FL, October 15-18, 1995. Title: Mixed Signals in the Aging Brain: What Happens and What Can Be Done.

Attended the 1995 Chemical Conference and the presentation of the 1995 Welch Award in Chemistry, Houston, TX, October 23-24, 1995.

Invited Speaker, 1995 American Chemical Society Combined Southeast-Southwest Regional Meeting, Memphis, Tennessee, November 29-December 1, 1995. Title of talk: Protein oxidation in Aging and Disease.

Invited Keynote Speaker, First Annual Research Workshop of the University of Michigan Institute of Gerontology's Center for Fundamental Research on the Biology of Aging, Ann Arbor, MI, May 20-21, 1996. Title of lecture: Reactive Oxygen-Mediated Alteration of Protein Conformation: Role in Aging and Disease.

Invited to present a lecture on protein oxidation and aging changes at the Department of Ophthalmology, University of Maryland, Baltimore, MD, September 24 1996.

Invited Participant/Speaker, Fifth Arkansas Toxicology Symposium, "Understanding the Causes of Aging and Cancer", Little Rock, Arkansas, October 10-11, 1996. Title of talk: Modifications of proteins by reactive oxygen species: Implications in aging and disease.

Invited to present a lecture on "Protein Oxidation in Aging and Disease", Department of Biological Sciences, Southern Methodist University, Dallas, Texas, October 18, 1996.

Invited Participant, Banbury Conference on Post-Translational Modification of Proteins, Lloyd Harbor, New York, March 9-12, 1997. Title of talk: Reactive oxygen-mediated modification of proteins.

Invited to present a seminar on the oxidative modification of proteins at the Department of Pharmacology and Toxicology, University of Kansas, Lawrence, Kansas, March 4-5, 1997.

Invited to present a seminar, "Reactive Oxygen-Mediated Modification of Proteins: Implication in Aging and Disease", as part of the Medicine Dean's Lecture Series at the Sanders-Brown Center on Aging, University of Kentucky, Lexington, Kentucky, March 19, 1997.

Invited to present a seminar on aging, free radical events, and ischemia-reperfusion injury at the Department of Physiology and Biophysics, Case Western Reserve University, Cleveland, Ohio, April 14, 1997.

To participate in the Biochemistry Seminar Series at The University of Texas at Austin, Austin, Texas, April 18, 1997. Title of Seminar: Protein Oxidation in Aging and Disease.

Invited to participate in the symposium "Oxygen Radicals and Aging", Allegheny University of the Health Sciences, Philadelphia, Pennsylvania, April 30, 1997. Title: Pro-oxidant Activity of SOD.

Invited Participant, First International Conference on the Chemistry and Biology of Peroxynitrite, Ascona, Switzerland, May 11-16, 1997. Title: Peroxynitrite-mediated nitration of tyrosine residues of regulatory proteins disrupts biological function.

Invited Participant in the Advanced Study Institute (ASI) course entitled "Free Radicals, Oxidative Stress, and Antioxidants. Pathological and Physiological Significance", Antalya, Turkey, May 24-June 4, 1997. Titles: "Free radical-mediated oxidation of proteins" and "The role of free radical-mediated protein oxidation in aging and disease".

Invited Participant in the Symposium "Photo-Oxidative Damage to Biomolecules: Measurement and Mechanisms", 25th Annual Meeting of the American Society for Photobiology, St. Louis, Missouri, July 5-10, 1997. Title: Oxidative protein damage by reactive oxygen species in human keratinocytes.

Invited Participant, NIA Workshop "Peptide and Protein Integrity: Special Features in Aging and Disease", NIH, Bethesda, Maryland, August 4-5, 1997. Title: Oxidative alterations of protein structure and biological activity during aging and disease.

Participated in the ASBMB Annual Meeting in San Francisco, California, August 24-29, 1997.

To attend the 4th Annual Meeting of The Oxygen Society, Oxygen '97, San Francisco, CA, November 20-24, 1997.

Invited to present a lecture on "Role of Free Radical-Mediated Protein Oxidation in Aging, Oxidative Stress, and Age-Related Diseases", at a meeting on "Adaptations to and Consequences of the Chronic Stress of Aging", on Friday, December 5, 1997, at the Universite Blaise Pascal-Clermont II, Clermont-Ferrand, France.

Invited to participate in the Bat Shiva Seminar on "Cellular, Molecular, and Genetic Aspects of Aging and Longevity", in Mount Carmel, Israel, December 7-12, 1997. Title of talk: Free Radicals and Aging, on December 8, 1997. Sponsored by: Organizers, Bat Shiva Seminar on "Cellular, Molecular, and Genetic Aspects of Aging and Longevity", Mount Carmel, Israel.

Invited to present a lecture on "Oxidative Damage of Proteins", at the COE (Center of Excellence) Symposium "Life and Oxygen" on December 19-20, 1997, at the Research Center for Advanced Science and Technology (RCAST), University of Tokyo, Tokyo, Japan.

Invited to present a seminar and meet with members and students to discuss recent research at the Department of Biochemistry, Yamaguchi University School of Medicine, Ube, Japan, on December 17, 1997.

Invited speaker at the Second International Symposium on Aging Skin to be held from January 30 to February 1, 1998, in Miami, Florida. The title of my presentation will be: Relationship between aging, oxidative stress, and oxidative protein damage in cultured human keratinocytes, dermal fibroblasts, and *human stratum corneum*.

Invited speaker at the meeting on “Superoxide Dismutase and Motor Neuron Disease”, at the Banbury Center, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, February 22-25, 1998.

To participate in the annual meeting of the American Society for Biochemistry and Molecular Biology, Washington, DC, May 16-20, 1998.

Invited speaker at the 3rd International Society of Vitamins and Related Biofactors Congress, Goslar, Germany, June 30-July 3, 1998.

Invited speaker at the NHLBI 50th Anniversary Symposium on “Oxidative Stress and Disease”, Lister Hill Center, NIH, Bethesda, MD, September 14, 1998.

Invited to present a seminar on “Protein oxidation in aging and disease” at the Department of Biochemistry and Biophysics, Oregon State University, Corvallis, Oregon, October 16, 1998.

To attend The Oxygen Society’s Annual Meeting, Washington, DC, November 19-23, 1999.

Invited to present a lecture entitled “Protein Oxidation in Aging and Disease” as part of the Advanced Topics in Drug Discovery graduate course, Northwestern Drug Discovery Program, Northwestern University Medical School, Chicago, Illinois, January 20, 1999.

Invited lecture, “Role of Protein Oxidation in Disease”, Oxygen Club of California ‘99 “Oxidants and Antioxidants in Biology”, Santa Barbara, CA, March 3-6, 1999.

Invited speaker, annual meeting of The American Society for Neurochemistry, New Orleans, LA, March 14-17, 1999.

Invited speaker, Cellular Responses to Low Doses of Ionizing Radiation, NIH, April 27-30, 1999.

Invited lecture, “Evaluation of protein damage mediated by reactive oxygen species and nitric oxide derivatives”, 1999 Gordon Conference on "Quinones, Radicals, and Redox Active Amino Acid Cofactors", Kimball Union Academy, Meriden, NH, June 13-18, 1999.

Invited lecture, “Proteasome-dependent degradation of oxidatively damaged proteins”, 22nd Annual Scientific Meeting of the Research Society on Alcoholism, Santa Barbara, CA, June 26-July 1, 1999.

Invited seminar at NIEHS, NIH in Research Triangle Park, NC, on September 13, 1999. Title: "Reactive Oxygen-Mediated Protein Damage: Involvement in Aging and Disease"

Invited seminar at The Aging Research and Education Center of the University of Texas Health Science Center in San Antonio, TX, on September 14, 1999. Title: "Is Free Radical-Mediated Oxidation of Biomolecules a Cause or Consequence of Aging?"

Invited speaker/participant in the workshop "Facility for Testing Interventions to Promote Healthy Aging", September 14-16, 1999, in Bandera, TX. Title: "Oxidative Stress".

Invited seminar, USDA, Agricultural Research Service, Beltsville Human Nutrition Research Center (BHNRC), Beltsville, MD, November 9, 1999. Title: "Reactive Oxygen-Mediated Modification of Proteins in Aging and Disease".

Co-Chair of Plenary Session "ROS-Mediated Protein Modification in Aging and Age-Related Diseases", at "Oxygen '99", The Sixth Annual Meeting of The Oxygen Society, in New Orleans, LA, November 18-22, 1999.

Invited to present a plenary lecture on "Protein Oxidation in Aging and Age-Related Diseases" at the 8th Congress of the International Association of Biomedical Gerontology, February 21-24, 2000, Hyundai Hotel, Kyongju, Korea, and to attend the Satellite Meeting: III. Free Radicals and Human Diseases, February 25, 2000, Kwangju, Korea.

Invited to present a lecture entitled "Protein Oxidation in Aging and Age-Related Diseases" at "Proteins That Talk: How Signals Are Heard", a symposium on protein recognition, phosphorylation, and degradation in honor of Professor Shmuel Shaltiel on the occasion of his 65th birthday, March 1-2, 2000, The Weizmann Institute, Rehovot, Israel.

Invited participant, "Symposium on Frontiers in Biomedical Research", March 15-17, 2000, University of Pennsylvania.

Invited to present a talk entitled "Biological Consequences of Free Radical Damage" at the "Symposium on Bio-Radical Mechanisms: Experiment & Theory" as part of the Canadian Society for Chemistry 2000 Conference & Exhibition, May 27-31, 2000, Calgary, Alberta, Canada.

Invited to give a presentation on "Modification of proteins by oxidative stress" at the meeting "Oxidative Stress and Atherosclerosis", June 22-24, 2000, Oslo, Norway.

Invited speaker at the 10th Biennial Meeting of the International Society for Free Radical Research (SFRR2000), Kyoto International Conference Hall (KICH), October 16-20, 2000, Kyoto, Japan. Title: Markers of Protein Oxidation in Aging and Disease.

Invited to present a talk on "Protein Oxidation in Aging and Exercise" at a session on "Molecular Aspects of Antioxidant Action and Aging" on May 31, 2001, at the 48th Annual Meeting of the American College of Sports Medicine, Baltimore Convention Center, Baltimore, MD.

Invited speaker at the two-day international symposium, First Hong Kong Symposium in Chemical Technology “Chemical Biology for Drug Development”, July 19-20, 2001, in Hong Kong. Title: “Protein oxidation in aging and disease”.

Invited speaker, 222nd Annual Meeting of the American Chemical Society (ACS), August 26-30, 2001, in Chicago, IL. Title: Modification of proteins by lipid peroxidation products.

Invited visiting professor in Miami Winter Symposia Series, May 6-10, 2002, at the Department of Biochemistry and Molecular Biology, University of Miami, in Miami, FL. Title: Protein oxidation in aging and disease.

Invited speaker, Third International Conference on Oxygen/Nitrogen Radicals: Cell Injury and Disease, June 1-5, 2002, in Morgantown, WV. Title: Cyclic oxidation and reduction of protein methionine residues is an important antioxidant mechanism.

Invited speaker, XIth Biennial Meeting of the Society for Free Radical Research International (SFFRI 2002), July 16-20, 2002, in Paris, France. Title: Antioxidant role of cyclic oxidation and reduction of protein methionine residues: Implication in oxidative stress and longevity.

Invited speaker, Gordon Conference on Oxidative Stress and Disease, March 16-21, 2003, Ventura, CA. Title: Methionine sulfoxide reductase as a genetic determinant of aging.

Invited Chair, Session 3: Site-specific Modifications of Cell Signaling Proteins by Sulfhydryl Switches, Workshop on Critical Sulfhydryl Switches, Diet, and Cancer Prevention, August 28, 2003, Bethesda, MD.

Invited speaker, 8th International Congress on Amino Acids and Proteins, September 5-9, 2003, Rome, Italy. Titles: “An overview of protein oxidation” and “Role of methionine oxidation in scavenging reactive oxygen species and in cellular regulation”.

EDITORIAL ACTIVITIES:

Editor, *Glutathione* (Symposium, Ridgefield, CT), 1954

Editor, *The Journal of Biological Chemistry*, 1960-65

Executive Editor, *Archives of Biochemistry and Biophysics*, 1960-69; 1972-2000

Editorial Committee, *Annual Review of Biochemistry*, 1963-67

Editor, *Circulation Research*, 1968-70

Editor, *Current Topics in Cellular Regulation*, 1968-present

Advisory Board, *Biochemistry*, 1969-76; 1980-84

Editorial Board, *Life Sciences*, 1972-75

Editor, *The Enzymes of Glutamine Metabolism*, 1973

Editor, *Metabolic Interconversion of Enzymes*, 1974

Editorial Board, *Proceedings of the National Academy of Sciences*, 1974-81

Editorial Board, *Trends in Biochemical Sciences*, 1975-78

Editorial Board, *The FASEB Journal*, 1986-92

Editorial Board, *Free Radical Biology and Medicine*, 1996-2005

AWARDS AND OTHER SPECIAL SCIENTIFIC RECOGNITION:

Paul Lewis Laboratories Award in Enzyme Chemistry, 1952
Awarded Medallion of the Societe de Chemie Biologique, 1955
Washington Academy of Sciences Annual Award in Biological Chemistry, 1957
Chairman, Committee on Policy and Procedures for Programming, American Society of Biological Chemists, 1962; 1965-66; 1972-74
Chairman, Division of Biological Chemistry, American Chemical Society, 1963-64
Advisory Committee, Oak Ridge National Laboratory, Oak Ridge, TN, 1963-69
Awarded Medallion of the University of Pisa, Italy, 1966
Elected Membership, American Academy of Arts and Sciences, 1969
Elected to National Academy of Sciences USA, 1969
Recipient of the Annual Hillebrand Award of the Chemical Society of Washington, March, 1969
National Academy of Sciences Award in Microbiology, 1970
Awarded Medallion of the University of Camerino, Italy, 1972
Distinguished Service Award, Department of Health, Education and Welfare, 1970
Board of Scientific Advisors, Roche Institute of Molecular Biology
National Academy of Sciences Committee on Biomedical Research in the Veterans Administration, 1974-76
Special Committee of the President of Max-Planck-Gesellschaft zur Foderung der Wissenschaftler, to assess present and future development of molecular, biological and biochemical research within the Max-Planck-Gesellschaft Institute, 1976-77
Council, International Union of Biochemistry, 1976-82
Recipient of the 1979 National Medal of Science - presented by President Carter
Recipient of the 1980 Meritorious Executive Award in the Senior Executive Service
Recipient of the 1981 Presidential Rank Award in the Senior Executive Service as "Distinguished Senior Executive" - presented by President Reagan
Chairman, Interest Group Committee, International Union of Biochemistry, 1981-85
Member of the Interdisciplinary Committee of Honorary Presidents appointed by the World Cultural Council, 1982
President, American Society of Biological Chemists, 1983
Recipient of the 1983 ASBC-Merck Award
Council of Scientific Society Presidents, 1982-83
Member, National Academy of Sciences Committee to Survey Opportunities in the Chemical Sciences - Parent Policy Committee, 1983
Executive Committee, International Union of Biochemistry, 1983-85
Honored at an International Symposium on the Molecular Basis of Cellular Regulation, held at NIH, Bethesda, MD, May 2-5, 1984. Proceedings of the symposium were published in Volumes 26 and 27 of Current Topics in Cellular Regulation
Advisor, The Third World Academy of Science, 1986-present
Board of Directors of The Passano Foundation, 1987-90
Honorary Degree, Doctor of Science, conferred by the University of Michigan, Ann Arbor, MI, 1987
Honorary Ph.D. Degree Honoris Causa conferred by The Weizmann Institute of Science,

Rehovot, Israel, November 11, 1988.

Board of Medical Directors for The Passano Foundation, Chairman Award Committee, 1989-90

Recipient of the 1991 Robert A. Welch Award in Chemistry

Recipient of the Research Award of the American Aging Association for 1992

Recipient of the 1993 Glenn Foundation Award

Member, American Federation for Aging Research (AFAR) Research Committee, 1995-Present

Honorary Ph.D. Degree Honoris Causa conferred by The University of Pennsylvania, Philadelphia, PA, May 17, 1999

Recipient of the Science and Humanity Prize awarded annually by the Oxygen Club of California, March, 2002.

PUBLICATIONS

1. Stadtman, E. R., Barker, H. A., Haas, V. A., and Mrak, E. M.: The influence of temperature on the deterioration of dried apricots. *Ind. Eng. Chem.* 38, 541-543, 1946.
2. Stadtman, E. R., Barker, H. A., Mrak, E. M., and Mackinney, G.: Studies on the storage of dried fruit, Experimental methods and the influences of moisture and sulfur dioxide on the rate of deterioration of dried apricots. *Ind. Eng. Chem.* 38, 99-104, 1946.
3. Stadtman, E. R., Barker, H. A., Haas, V. A., Mrak, E. M., and Mackinney, G.: Studies on the storage of dried fruit. Gas changes during storage of dried apricots and the influence of oxygen on the rate of deterioration. *Ind. Eng. Chem.* 38, 324-329, 1946.
4. Stadtman, E. R.: Nonenzymatic browning in fruit products. *Adv. Food Res.* 1, 324-370, 1948.
5. Haas, V. A., Stadtman, E. R., Stadtman, F. H., and Mackinney, G.: Deterioration of dried fruits. I. The effect of sugars and furfurals. *J. Am. Chem. Soc.* 70, 3576-3579, 1948.
6. Stadtman, E. R. and Barker, H. A.: Two new reactions producing acetyl phosphate. *J. Biol. Chem.* 174, 1039, 1948.
7. Stadtman, E. R. and Haas, V. A.: Deterioration of dried fruits. Use of ion exchange resins to identify types of compounds involved in browning. *Ind. Eng. Chem.* 41, 983-985, 1949.
8. Stadtman, E. R., Stadtman, T. C., and Barker, H. A.: Tracer experiments on the mechanisms of synthesis of valeric and caproic acids by Clostridium kluveri. *J. Biol. Chem.* 178, 677-682, 1949.
9. Stadtman, E. R. and Barker, H. A.: Fatty acid synthesis by enzyme preparations of Clostridium kluveri. I. Preparation of cell-free extracts that catalyze the conversion of ethanol and acetate to butyrate and caproate. *J. Biol. Chem.* 180, 1085-1093, 1949.
10. Stadtman, E. R. and Barker, H. A.: Fatty acid synthesis by enzyme preparations of Clostridium kluveri. II. The aerobic oxidation of ethanol and butyrate with the formation of acetyl phosphate. *J. Biol. Chem.* 180, 1095-1115, 1949.
11. Stadtman, E. R. and Barker, H. A.: Fatty acid synthesis by enzyme preparations of Clostridium kluveri. III. The activation of molecular hydrogen and the conversion of acetyl phosphate and acetate to butyrate. *J. Biol. Chem.* 180, 1117-1124, 1949.
12. Stadtman, E. R. and Barker, H. A.: Fatty acid synthesis by enzyme preparations of Clostridium kluveri. IV. The phosphoroclastic decomposition of acetoacetate to acetyl phosphate and acetate. *J. Biol. Chem.* 180, 1169-1186, 1949.

13. Stadtman, E. R. and Barker, H. A.: Fatty acid synthesis by enzyme preparations of Clostridium kluyveri. V. A consideration of postulated 4-carbon intermediates in butyrate synthesis. *J. Biol. Chem.* 181, 221-235, 1949.
14. Stadtman, E. R. and Barker, H. A.: Fatty acid synthesis by enzyme preparations of Clostridium kluyveri. VI. Reactions of acylphosphates. *J. Biol. Chem.* 184, 769-793, 1950.
15. Stadtman, E. R. and Lipmann, F.: Acetyl phosphate synthesis by reaction of isopropionyl-acetate and phosphoric acid. *J. Biol. Chem.* 185, 549-551, 1950.
16. Stadtman, E. R., Novelli, G. D., and Lipmann, F.: Coenzyme A function in and acetyl transfer by the phosphotransacetylase system. *J. Biol. Chem.* 191, 365-376, 1951.
17. Stadtman, E. R., Doudoroff, N., and Lipmann, F.: The mechanism of acetocetate synthesis. *J. Biol. Chem.* 191, 377-382, 1951.
18. Stern, J. R., Shapiro, B., Stadtman, E. R., and Ochoa, S.: Enzymatic synthesis of citric acid. III. Reversibility and mechanism. *J. Biol. Chem.* 193, 703-720, 1951.
19. Stadtman, E. R., Katz, J., and Barker, H. A.: Cyanide-induced acetylation of amino acids by enzymes of Clostridium kluyveri. *J. Biol. Chem.* 195, 779-785, 1952.
20. Stadtman, E. R.: The net enzymatic synthesis of acetyl coenzyme A. *J. Biol. Chem.* 196, 535-546, 1952.
21. Stadtman, E. R.: The purification and properties of phosphotransacetylase. *J. Biol. Chem.* 196, 527-534, 1952.
22. Stadtman, E. R.: The enzymatic synthesis of acyl coenzyme A compounds. *J. Cell Comp. Physiol.* 41, 89-107, 1953.
23. Burton, R. M. and Stadtman, E. R.: The oxidation of acetaldehyde to acetyl coenzyme A. *J. Biol. Chem.* 202, 873-890, 1953.
24. Stadtman, E. R. and Kornberg, A.: The purification of coenzyme A by ion exchange chromatography. *J. Biol. Chem.* 203, 47-54, 1953.
25. Stadtman, E. R.: The coenzyme A transphorase system in Clostridium kluyveri. *J. Biol. Chem.* 203, 501-512, 1953.
26. Stadtman, E. R. and Stadtman, T. C.: The metabolism of microorganisms. *Annu. Rev. Microbiol.* 7, 143-178, 1953.

27. Stadtman, E. R. and White, F. H.: The enzymatic synthesis of N-acetylimidazole. *J. Am. Chem. Soc.* 75, 2022, 1953.
28. Tabor, H., Mehler, A. H., and Stadtman, E. R.: The enzymatic acetylation of amines. *J. Biol. Chem.* 204, 127-138, 1953.
29. Stadtman, E. R.: Discussion, Symposium on Coenzyme A. *Fed. Proc.* 12, 692-693, 1953.
30. Stadtman, E. R.: The Role of Sulfhydryl Compounds in Acyl Transfer Reactions, Gluta- thionine, Academic Press, New York, 1954, pp. 191-205.
31. Stadtman, E. R.: On the energy rich nature of acetyl imidazole, and enzymatically active compounds. *In Mechanism of Enzyme Action* (McElroy and Glass, eds.), Johns Hopkins Press, Baltimore, 1954, pp. 581-598.
32. Stadtman, E. R. and Burton, R. M.: Aldehyde dehydrogenase from *Clostridium kluyveri*. *Meth. Enzymol.* 1, 518-523, 1954.
33. Stadtman, E. R.: Amino acid metabolism. *Science* 120, 589-590, 1954.
34. Stadtman, E. R.: Studies on the biochemical mechanism of fatty acid oxidation and synthesis. *Record Chem. Progr.* 15, 1-17, 1954.
35. Stadtman, E. R.: The role of sulfhydryl compounds in acyl transfer reactions. *In Proceedings of Glutathione Symposium*, 191-205, 1954.
36. Brady, R. O. and Stadtman, E. R.: Enzymatic thioltransactylation. *J. Biol. Chem.* 211, 621-629, 1954.
37. Miles, H. T., Stadtman, E. R., and Kielley, W. W.: A resin for the selective retention of sulfhydryl compounds. *J. Am. Chem. Soc.* 76, 4041, 1954.
38. Stadtman, E. R.: Amino acid metabolism. *Science* 120, 589-590, 1954.
39. Stadtman, E. R., Kornberg, A., and Barker, H. A.: Fatty acid enzymes, Coenzyme A transphorase from *C. kluyveri*. *Meth. Enzymol.* 1, 1955.
40. Stadtman, E. R.: Reactions of 2-carbon compounds, Phosphotransacetylase from *C. kluyveri*. *Meth. Enzymol.* 1, 596-600, 1955.
41. Stadtman, E. R.: Reactions of 2-carbon compounds, Aldehyde dehydrogenase from *C. kluyveri*. *Meth. Enzymol.* 1, 1955.

42. Stadtman, E. R.: The enzymatic synthesis of β -alanine coenzyme A. *J. Am. Chem. Soc.* 77, 5765-5766, 1955.
43. Miles, H. T. and Stadtman, E. R.: Isolation and characterization of 6,7-dimethyl-9-(2-hydroxy-ethyl) isoalloxazine as a bacterial fermentation product of riboflavin. *J. Am. Chem. Soc.* 77, 5746, 1955.
44. Stadtman, E. R.: Propionic acid fermentations. *Bulletin de la Societe de Chimie Biologique* 37, 931-938, 1955.
45. Brady, R. O. and Stadtman, E. R.: Neurobiology L. *In* *Neurochemistry* (Korey and Nurberge, ed.), Paul B. Hoeber, Inc., New York, 1956, pp. 26-39.
46. Stadtman, E. R.: Discussion of Dr. Plaut's paper on "The Biogenesis of Riboflavin", presented at the National Vitamin Foundation Meeting, for publication in *NVF Journal*, New York, March 1956.
47. Brady, R. O., Mamoon, A.-M., and Stadtman, E. R.: The effects of citrate and coenzyme A on fatty acid metabolism. *J. Biol. Chem.* 222, 795-802, 1956.
48. Stadtman, E. R.: Preparation and assay of acetyl P. *Meth. Enzymol.* 3, 1957.
49. Stadtman, E. R.: Preparation and assay of acyl coenzyme A and other thiolesters: Use of hydroxylamine. *Meth. Enzymol.* 3, 1957.
50. Kornberg, A. and Stadtman, E. R.: Preparation of coenzyme A. *Meth. Enzymol.* 3, 1957.
51. Stadtman, E. R. and Vagelos, P. R.: Propionic acid metabolism. *International Symposium on Enzyme Chemistry Tokyo and Kyoto*, Pan-Pacific Press, Tokyo, 1958, pp. 86-92.
52. Smyrniotis, P. Z., Miles, H. T., and Stadtman, E. R.: Isolation and structure proof of 3,4-dimethyl-6-carboxy-a-pyrone as a bacterial degradation product of riboflavin. *J. Am. Chem. Soc.* 80, 2541-2545, 1958.
53. Stadtman, E. R.: The biosynthesis and degradation of riboflavin. IV. *International Congress of Biochemistry*, Vienna, I-II, 1958.
54. Miles, H. T., Smyrniotis, P. Z., and Stadtman, E. R.: Bacterial degradation products of riboflavin. III. Isolation, structure determination and biological transformations of 1-ribityl-2,3-diketo-1,2,3,4-tetrahydro-6,7-dimethyl-quinoxaline. *J. Am. Chem. Soc.* 81, 1946-1951, 1959.
55. Vagelos, P. R., Earl, J. M., and Stadtman, E. R.: Propionic acid metabolism. I. The purification and properties of acrylyl coenzyme A aminase. *J. Biol. Chem.* 234, 490-497, 1959.

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