Behind the Mask

Valerie Florance, Ph.D., Acting Scientific Director, Intramural Research Program, National Library of Medicine (NLM)

Yanli Wang, Ph.D., Program Officer, Extramural Research Program, NLM

Marie Gallagher, Computer Scientist, Applied Clinical Informatics Branch, Lister Hill National Center for Biomedical Communications, NLM

Interviewed by Gabrielle Barr, Archivist, Office of NIH History and Stetten Museum, National Institutes of Health
June 24, 2021

Barr: Good morning. Today is June 24, 2021. My name is Gabrielle Barr, and I'm the Archivist with the Office of NIH History and Stetten Museum. Today, I have the pleasure of speaking with Dr. Valerie Florance, who's the Acting Scientific Director of the Intramural Research Program, Dr. Yanli Wang, who is the Program Officer with the Extramural Research Program, and Ms. Marie Gallagher, who is a Computer Scientist in the Applied Clinical Informatics Branch. All three of these individuals are part of the National Library of Medicine [NLM], and today they are going to speak about some of their COVID experiences and work. Thank you very much for being with me.

Florance: Happy to be here.

Barr: To get started, briefly can you introduce what the RADx-rad [Rapid Acceleration of Diagnostics-Radical] program is? That's something that all three of you have been a major part of in one way or another.

Florance: I guess I can start as I was on the working group.

Wang: Thank you. Valerie.

Florance: Yeah, and actually, I'm looking at what's on the website as well. But you can tell by the name that the point was this particular—RADx had multiple components. This particular one, and most of the early ones—RADx-Up [RADx Underserved Populations], for example, and others, and even the RADx Tech—those were really, really focused on how to get people tested, how to convince them to be tested, and get those [COVID] tests done. We were given the mission of taking a more radical view—thinking about nontraditional ways of identifying the presence of the virus in a community, or even how many people had been vaccinated, how many people had gotten sick. This was early. This was in 2020. They call it "radical" for that reason. It had a lot of great, interesting examples—like the electronic nose. That isn't something you normally think of NIH working on—the idea that you might be able to sense or smell or find other ways to identify where that virus is. That's what I would say. I liked it because I like the radical side of it. It sounded like fun, and that is the really important thing. High-risk, high-reward is an important way to move science forward.

That's what I saw, and I think the other members of the committee felt the same way. The committee itself had probably 17 Institutes and Offices represented on it. It had a representative from the RADx executive committee and also someone from the Office of the NIH Director, and then we had two leaders and a bunch of us in the room having a good time trying to figure out how to be nontraditional. [Laughs.]

Barr: Well, that's a really hard thing to do. What was your role as part of this group, and how did you go about brainstorming how to be nontraditional in such a quick way? I mean, you guys had to be really fast.

Florance: Well, we did have that description of what the NIH defined RADx-rad as, so we knew that was our starting point. All the Institutes at NIH largely have a condition or an organ that they're interested in and looking for ways to keep it healthy, make it healthy, identify [problems]. For everybody [on this team], they had to think beyond that, and think about, "Okay, given this area that I care about"—children or dentistry or whatever it was—"what alternatives might there be?" We had some open discussions.

Now, the National Library of Medicine is an Institute of NIH just like those others. The organ or body part we care about is information. So that's why we were there. That's a shorthand way of saying it because that's what I used to tell people what an information scientist is. We have something we care a lot about, and whether you call it data, whether you call it knowledge, it's still about that.

I ran the extramural grant programs for the National Library of Medicine that were focused on developing novel computational methods and approaches for managing and integrating and mining and understanding data, information, and knowledge. That scientific focus made sense in this particular kind of activity because computers are going to help if you can get the data and mine it properly. Is that enough?

Barr: That is. Can you describe the process that you all went through in designing and issuing the funding announcements?

Florance: I apologize. Can you hear this? There are lawn mowers right outside my window. I can't help that.

Barr: That's okay. It's part of the pandemic. You're working from home.

Florance: Still there [and] the witch doctor behind me. That too. It was very interesting. We just started talking about our areas of our scientific interests, and what we imagined we could contribute. That was just sort of a free for all. We had two great leaders of that group who kept the conversation going, but we also had a very collegial kind of thing. There wasn't any competition going on. We had a model—we would put out a Notice of Intent to Publish and tell people about the kind of areas that we were interested in. Then we would start issuing funding announcements and these emergency awards. This whole model is different from what all of us who are used to making grants did, so we had a little bit of learning to do about that, too.

We volunteered. I'll take an example because it affects the other people that we're talking to here. The RADx-UP, which I had also participated on, for underrepresented populations, had already issued a funding announcement for a Data Coordinating Center. Now they had a different goal for theirs than we had for ours, but we knew, particularly, we're doing radical stuff right? We might have had all different kinds of data. We couldn't necessarily predict it. We also had the idea that we would like to have the data accessible in one place so that every individual principal investigator didn't have to keep it going forever. Because these are data that people will be able to use for years to learn and study more.

I volunteered to draft that funding announcement because it seemed so perfectly within our mission. But we also were involved in other areas, too. We signed on and participated in some—in one case, I think we may talk about it later, we had a grantee already working in an area, who then got a supplement. We would take turns

bringing a draft, letting everybody comment on it, and then the committee would decide, “Yes, that’s a good one. Let’s go with it.”

Barr: What was your timeframe? What did your timeframe look like, and what were some of the other considerations that you had to make?

Florance: The timeframe was as fast as we could do it. [Laughs.] That is a large consideration for sure. To be able to frame the language in a way that people understood that it was different from the [usual]—so they might be used to seeing an announcement come from NLM to look at computational reasoning. That doesn’t mean anything to lots of people. We wanted a very broad scope, because some of these are really engineering kinds of tasks and we wanted small businesses who might be interested in developing things, too.

We took all those things into account, and we tried to make sure that we weren’t duplicating stuff that our own Institutes or others were already doing. I think those are some—if you talk to the chairs of this committee, they may have other things. But we definitely all agreed on the things that we did. We didn’t have to take a vote. We were excited and ready to rock.

Barr: That’s really great. Can you mention some of the projects that received funding in the first round, including those that were sponsored by NLM? I know one of them was the wastewater-based surveillance of infectious diseases.

Florance: I can think about NLM’s [projects]. I want to talk about that one because I’ve always thought it was funny, and other people do too. Why is a library supporting research in wastewater surveillance? Well, the answer is because the National Library of Medicine has had an interest in public health surveillance and has funded research and training in it for a number of years. In this particular one, that is part of this initiative. I just want to point out how interesting it really is. There is plenty of wastewater surveillance going on in cities and counties all around the world. It’s actually a hot topic. But in the U.S., because we’re the way we are, there are communities including right around me where I live here in Maryland, where people have septic tanks. If you only go to the wastewater treatment plant and get information, you don’t know everything. Then there’s—I can’t even remember the phrase they use for it—just water. There’s just surface water that needs to be tested, too.

The idea was to try and look at these different ways and find a way to identify the presence of a new virus, or the sudden growth of a bunch of viruses like the one we are talking about. How close to where people live? And what is the best source? Or do you need to get the information from three different places and put it together in some way? The test, which I think is a really great one, too, is to figure out whether they could identify it more quickly than you could find out by looking at the morbidity and mortality reports. If we could do that, then we could really help communities. I think the project is looking at 25 or 30 different locations around the country, trying to get this estimate of how quickly you can find it out, and where is the best place to do the sampling.

There were also—I will have to look up and I can find names of other kinds of projects. For the NLM, we also invited applications for supplements from grantees we already had, like this one, who were working in areas of deep phenotyping and clinical records, for example, as a way to try and see whether there might already be information in the electronic health care data that could help us identify a patient who might be sick before [showing symptoms] by looking at what we already knew about them. We had a couple of things like that that were special to us but within the scope of this project.

Barr: Well, another project that got funded, I know, was a Data Coordination Center that both Marie and Yanli worked on. So Yanli [Wang] and Marie [Gallagher], can you please discuss your roles and responsibilities in the RADx-rad Data Coordination Center [DCC], as well as just speak a little bit about some of the other individuals who are a part of this effort?

Wang: Sure. So my role is the Program Officer for the RADx-rad Data Coordination Center project. Basically, my responsibility and standard responsibility included assisting in enforcing general regulatory or administrative assistance policy requirements; evaluating project progress by reviews of technical fiscal reports or by site visit in the future to determine [whether] the performance is consistent with the RADx-rad objectives, and terms and conditions of the award; ensuring [that] the activities proposed for development or implementation don't overlap with or duplicate activities supported by other peer-reviewed funding mechanisms; reviewing and approving all major transitional changes of this Data Coordination Center activities prior to implementation to ensure consistency with the goal of the monetary institutional commitments; and assisting the grant management official with financial oversight of the program as needed. And beyond that....

Barr: That's a lot.

Wang: That's a lot, but what is more exciting is I after I started the job, [there were] a lot of surprises. Many new challenges, which I enjoy a lot. So this RADx-rad initiative, as Valerie described, has a very large and diverse portfolio. It includes research areas from wastewater surveillance as you and Valerie talked about—chemosensory, normal biosensory, and other automated surveillance tracing [methods].

So, yeah, [there are] very diverse research areas. It's pretty exciting—putting scientists [and] researchers together from these many areas. So you want things to do, to think hard. The Data Coordination Center plays a very important job for facilitating the RADx-rad program to move it forward. It is called DCC. It has three major components to support the RADx-rad. The first one is the general administrative coordination call. Basically that's putting people together and identifying common issues, for example, IRB [Institutional Review Board] consultation; how to do the consent forms; what is the language; and what are the concerns and issues?

The second is the very important part of the facility—data collection. For that purpose, there's a lot of work that needs to be done about how to answer those kinds of questions and [develop a] timeline. There are guidelines from NIH regarding common data elements [CDE] and timelines of data sharing [and] submission. So, all this work is coordinated by the DCC. To support the mission, the DCC now needs to set up work for a lot of algorithms—IT [information technology] kind of development. For example, all data to be shared to NIH needs to be de-identified [for privacy]. So the DCC needs to provide tools for data de-identification.

And there are many other aspects. For example, beyond the minimum common data elements that NIH requires for all projects across RADx, RADx-rad has a really wide range of research areas and many new technologies. DCC needs to work very closely with the PIs [principal investigators] for each program to develop the terminology, to describe the new technology, and also try to come up with a common set for variables. We call that tier-2 CDE community elements, if ever possible, to describe the parameters and the variables from the measurement of this new technology. So [there's] a lot of challenges.

And the third part of DCC is diagnostics. It has turned out that it has become a very important component of this DCC. As the pandemic situation developed, there are new virus variants. And also now, as you know, the

situation is getting better. The different projects need our samples to continue testing of the technology they are developing. So they need samples and DCC just fills up this gap.

It turns out that the three components at the Data Coordinate Center really work well. As Valerie already told us, NIH plans to provide a Central Data Repository. That is beyond the Data Coordination Center across RADx. On top of that, NIH provides a central repository to store the COVID data generated by the RADx project, and also provide public access to these data for secondary use and data analysis for the future. So there is a lot of work.

Barr: Yes. I have some questions for you, based on what you said. Are a lot of the tools that you're recommending to these different principal investigators existing tools or are you developing tools specifically for their COVID projects and needs?

Wang: It's a mixture. The Data Coordination Center has developed several tools for mapping the variables from each project to common data elements that already exist. So this is an example. We are focusing now on developing new tools. Also the deposition—the submission portal—to support the project to first provide data to DCC. Then through DCC, the data will eventually be deposited at the NIH Central Data Repository.

Barr: Yeah. Well, there's such a variety of projects and people involved. How did you prepare yourself to work with all these different actors who are part of this initiative?

Wang: There are a lot of challenges. First of all, Valerie has always been encouraging me, so that helps. [Laughs.] And I have Marie on my side to support, so that also helps. So, yeah, but you're just learning so all the time. So that's the key. And be patient, consistent, and friendly.

Barr: Yeah, definitely. Marie, what has been your role?

Gallagher: Hi. I feel really lucky to be part of this. Thanks to Valerie and Yanli, I'm on part-time detail to the RADx-rad DCC. It's been, I could say, truly a pleasure. I've never before—with all due respect to all the meetings I've gone to in the past—I really enjoy going to these meetings, because you learn so much. People are so—as both Valerie and Yanli mentioned—cooperative and mutually supportive of each other. That's inspiring. It really, really is. You hear all the time, "We're all in this together," and you can feel it throughout all of these meetings. So I stand in support of Yanli, anything that she needs, I want to be there for her. She's so good. She almost never needs me. [Laughs.] I'm always happy to do whatever I can. I take notes at the meetings, very detailed notes. First of all, I enjoy it, and second of all, I want them to be available to her in case she needs them.

I also get to be a project scientist, along with Dina Demner-Fushman and Leslie Derr and Tony Kirilusha on the RADx-rad DCC project. I've enjoyed getting the chance to do some beta testing of the tools that Yanli was mentioning. That's been really interesting and fun, and I hope to continue with that.

Barr: Is it one at a time, or do you test multiple at the same time? How does that work—doing the beta testing?

Gallagher: They're developing them, I think, one at a time. They'll put a tool out, finish developing it, and then put it out for beta testing. So, as Yanli mentioned, we tested the interactive mapping interface for mapping CDEs. Currently we're beta testing an ID [identification] generator that generates an ID for participants that are

in the study. I think the idea is to protect the privacy of the participants yet be able to know when a participant is in multiple studies. So that'll be really interesting.

Barr: Are there a lot more things still to test out there?

Gallagher: I think they're going to develop more tools. Yanli probably knows more than I do, but they're going to have to do something with zip codes, because a person can be identified if the zip code has very few participants in it; [and] something about dates of birth. It's evolving, and that's one of the really interesting things about this project, too. It's evolving as they discuss de-identification and other issues.

Barr: Do you think that some of these tools can be applied to non-COVID-related initiatives? Because it seems like it could apply to a lot of kinds of research.

Gallagher: I certainly think so. Absolutely. Yes. For de-identification, that'll be important across many areas, absolutely.

Barr: Oh, that's really great. Another one of my questions would be, can you all talk particularly about some of the challenges you all have faced as well as some of your hopes for the Data Coordination Center?

Gallagher: The challenges, I'm sure that Yanli and Valerie are going to have much better answers for this. I've been amazed at how adaptable everyone has been. First of all, as Valerie said, doing things really fast. I think both Valerie and Yanli mentioned doing things as the world is changing. Vaccines develop while this is going on, so there are fewer people to get tested. There is still testing needed, because not everyone is getting vaccinated. Variants are developing so fast, and the tests have to be able to detect all of the variants. In these meetings, we hear discussions about ethical and legal issues. "Well, are we really de-identifying enough? Are we going to end up exposing somebody's identity accidentally?" The challenges are amazing. It's impressive.

Barr: There have been a lot of trainings. Can you talk a little bit about what some of those trainings have been like for them to help some of the PIs with their work?

Wang: Yeah. The DCC provides office hours. At the beginning, it was weekly. Now some of the office hours have become biweekly. Not everyone pops up at all meetings, but some PIs do and also many POs [program officers] attended the office hours. Basically, they can have different topics discussed. Also, the PI can bring up their concerns and questions to the office hours for discussion. Each of the core functionalities at DCC has its own set up, its own office hours during the week. That's a very good channel for discussion [and] communication between the RADx-rad DCC and the PI.

The DCC has also conducted several surveys, from the beginning up to now, to understand the concerns, suggestions, and the research and progress from the each of the RADx-rad projects. For example, for the minimum Common Data Elements (CDE) guidelines, the DCC conducted a survey early on that collected a lot of information. With that, we had a very constructive discussion with the NIH CDE [Governance] Committee. That [discussion] helped further the development of the final CDE elements [as well as] the choices for responding to the elements in the CDE list. So lots of training, lots of learning, and lots of developing. For challenges, Maria has given a very nice summary of some of the challenges.

Going forward, there is also the work with FDA as you outlined in your question. The RADx-rad has a monthly meeting with FDA staff. RADx-rad through DCC collects questions from each PI. If they have a plan to apply for FDA EUA [Emergency Use Authorization], they can submit their questions. Those questions can be very specific

to their technology. Because of RADx-rad's nontraditional, radical approach, some of the technologies are new to FDA. They need to present new work and challenges to FDA. [FDA] needs to understand first what these technologies are about and how they work. It's a very exciting area.

Barr: It is exciting.

Wang: It is, yes. The other is phase two of the RADx-rad. We are now developing a pipeline to try to support and accelerate commercialization of some of the technologies developed at RADx-rad. The POs and PIs think, "Oh, wow, the technology has matured enough." They can go to that next step. RADx-rad provides some funding, sets aside funding, to support the early-stage development of the commercialization. That's called Deep Dive. By coordinating with RADx Tech/ATP, by leveraging the established partner workflow by the RADx Tech—that's another broader collaboration between the different RADx initiatives. That's another challenge.

Barr: How have you guys been working with—I saw that you all have been working with the CDC [Centers for Disease Control and Prevention] and this and some other agencies as well. How have you been doing that?

Wang: The wastewater program, particularly, has a very close collaboration with CDC. Some of the PIs also participate in the National Surveillance Program organized by CDC. The RADx-rad DCC works through the PI of the wastewater project and works with CDC developing a community data standard for that area of work. It's a collaboration.

[Another collaboration is with] NIST [National Institute of Standards and Technology]. Some of the technology is new in RADx-rad, so developing and identifying community standards for validating technology is a non-trivial task. NIST may help.

Barr: That's really nice. Are there going to be any more RADx-rad awards given out?

Wang: There will be the second phase development. The Deep Dive for the accelerating the commercialization of the RADx-rad technology is one development. The other development of the second phase RADx-rad is called RADx-rad and PASC [post-acute sequelae of SARS-COV-2 infection]. Now people try to call it RADx-rad Recovery. Just think about [it as] the second step. After all the data is here, [we determine] how to use them and develop some predictive diagnostic technology, data-driven projects.

Barr: Yeah. What have each of you learned from your experience with RADx-rad that you hope to apply to other projects? We can start with you, Yanli, because you are already on the screen.

Wang: For RADx-rad particularly, the goal of the development first is for testing technology development for COVID-19. But [the technology can also be applied to] future infectious diseases. That has been the idea behind RADx-rad. Essentially, all technologies developed for COVID-19 are encouraged to be extended to other application areas. Once the data is gathered, collected, that will advance many other research [projects].

Barr: Marie and Valerie?

Florance: I think I would allude to the fact—I think Marie already said it—of being able to build the plane while you're flying it is a great challenge. It's fun, but it is like, "Ahhh!" [Puts hands up to face like she's screaming.] I like that. Not everybody does like that. But the opportunity to get to work with a bunch of other people who have a common goal, part of that is being a public servant. I'm sorry. We're here to try and make the world a

healthier, better place. When we can work on things, even if they seem like, "Ahhh!" this demanding of time and all of your best thinking. [Puts hands up to face like she's screaming.] It will have good outcomes. The other thing I think went on that you can hear through this conversation is whole new initiatives at NIH sprung up as well. That CDE thing wasn't there when we started. There was just a small collection of common data elements and then it turned into something completely different once NIH started thinking about the data and the need to be able to bring it together in a useful way. I think those were exciting things. And it isn't going to go away, because we love it when Congress gives us more money to do new, important things that will help.

Barr: Yeah. Do you think the radical approach will continue into the future?

Florance: Yes. [Laughs.] It won't be called that. Take, for example, there's a new initiative proposed that would make us have a little component of ourselves, like DARPA [Defense Advanced Research Projects Agency], that instead of being a regular health part of HHS [Department of Health and Human Services] or part of NIH, [it would be a] completely different process and all that kind of stuff. But it has a good goal. Something like that can happen. We have plenty of smart, talented, and energetic people at NIH who will want to help. That's a plus.

Barr: Marie, what have you learned from your experiences with RADx-rad, as well as any other COVID initiatives you've been helping with that you hope to apply to other projects in the future?

Gallagher: I think that spirit of cooperation that I mentioned has really been major for me on this effort. Cooperation more than competition. It's been fabulous and I hope that will continue. I just lost my train of thought. Yanli was mentioning the office hours. The office hours are a fabulous source of expertise for the awardees. The awardees can drop in and ask these world experts any question any time. I think that's a model that I'm trying to bring to other projects, too, that I've suggested to other people. Those office hours are fabulous. It's a great idea. Lots of lessons learned. Everyone being focused on the same thing together, and even awardees helping each other. Like I said, everyone wants everyone to win and succeed. That's been amazing. Really wonderful.

Barr: That is wonderful. Well, my last question will be of kind of a fun question. What is one thing that you enjoy that has allowed you to manage the pandemic times easier than maybe it would have been?

Florance: I want to hear it again, please.

Barr: What is one thing that you enjoy doing that has allowed you to cope with the pandemic, personally and professionally?

Florance: I will say, I know no one will agree with this, being able to have a Zoom meeting like this—where I actually can see and interact with people instead of telephone or email back and forth—is huge. It's making it more possible—I've met people I don't know. I can work with them. In the committee meetings that we had in the past, that wasn't how it was. That isn't how we met, and that wasn't how we engaged. For me, this is a huge plus, especially since we've been on remote work for more than a year.

Wang: It was very unfortunate that this pandemic happened. It affected so many people and each of our daily lives and work. On the other hand, I feel lucky, and I give my big thanks to Valerie for providing me with this opportunity to work with a group of really wonderful colleagues. I got to learn a lot—the technologies and development—and I gained knowledge. And also, I have learned a lot with our senior colleagues on how they manage this very complex initiative. It has been a great opportunity for me. I had my tears. [Laughs.] Yes, but it's all worth it. I'm very glad things have been going quite smoothly, given a very aggressive timeline.

Gallagher: I've been very fortunate during the pandemic. I know a lot of people have gone through terribly difficult times. But first of all working at NIH, there just couldn't be a better place to be right now. You have an employer that cares so much about your wellbeing, and you're getting reliable information all the time about what's going on. I think that was probably the biggest thing that helped me cope. If I had been anywhere else, things might have been different.

As Valerie was mentioning, being able to see people on Zoom. It took a little getting used to, but you're right, if we didn't have that, things would have been very tough, not having that connection. It is interesting, we all at work and at home reached out to help each other. For example, I know that some of my neighbors and my parents and my parents' neighbors are more vulnerable, and so we formed this little network where we would help each other. We would consolidate trips to the grocery store, and we would get things for each other. I think having that sort of shared experience and taking care of each other has really been what's helped me cope.

Wang: And then of because RADx-rad, I think we all feel excited and also proud of our—Valerie, Marie, and myself—participation in this very important initiative, and thinking of the impact of these initiatives to the nation. It's a once-in-a-lifetime thing to have this opportunity to make some contributions. That makes me feel good, happy.

Barr: Well, that's really nice. I wish all of you continued success, and I look forward to hearing how it continues to go, and I wish you, of course, continued safety to you and your family and your coworkers.

Florance: Likewise.

Wang: Thank you so much. Gabrielle.

Gallagher: Thank you.