

# LAB MATTERS

analysis|answers|action

Winter 2022 Issue 4



## The Many Career Pathways in Public Health Laboratory Science

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**ASSOCIATION OF PUBLIC HEALTH LABORATORIES**

APHL Newborn Screening  
Symposium  
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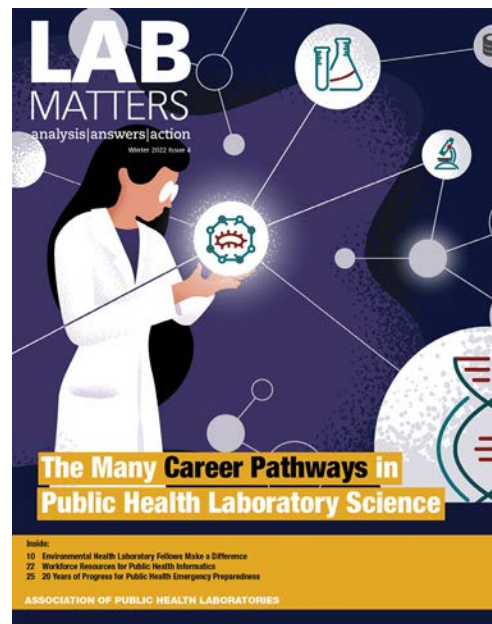
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#### 4 The Many Career Pathways in Public Health Laboratory Science

Each laboratorian's story of their public health laboratory career is one-of-a-kind. These are often journeys filled with opportunity, serendipity and supportive mentors. But for every success story, there are people inside and outside of public health who do not know about the opportunities at public health laboratories or how to access them. APHL and other public health leaders are working to change that.



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The Association of Public Health Laboratories (APHL) works to strengthen laboratory systems serving the public's health in the US and globally. APHL's member laboratories protect the public's health by monitoring and detecting infectious and foodborne diseases, environmental contaminants, terrorist agents, genetic disorders in newborns and other diverse health threats.

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# Reflections on the Journey, and Iterating for Public Health

**Q: How did you each find your way to public health?**

**Daphne Ware:** A good question, and we just talked about it!

**Scott Becker:** When we were together for the Newborn Screening Symposium, we had this conversation. It was three hours of, "How did you get where you are?" And Daphne has a great story.

**Ware:** I wanted a job that was stable, a job that was in Mississippi and a job that I could grow as a person as well as growing that organization. I had gone and interviewed at a lot of different places and had offers from pharmaceutical companies and hospital laboratories. But I was looking at a lot of different options when I came out of graduate school, and there really wasn't a lot of guidance on what to do with your degree. So I just searched the early Internet, AOL'd and Yahoo'd looking for job options. I saw the Mississippi State Personnel Board website had an open technologist position. Well, I thought, I could do that for a little bit until I figured out exactly what I wanted to do. I applied for it and got a call for an interview the very next day. I was interviewed by 10 different people on a panel. It was very intimidating! At that time, I didn't even know what the public health laboratory was, but they hired me as a contract worker to run their Laboratory Response Network lab.

**Becker:** My undergraduate degree was in General Business, which means there's no specific pathway. But during my undergrad, I was an intern on Capitol Hill and worked for the senator from Minnesota who was chair of one of the health committees, but it was health care financing. I decided I hated health care financing, but the idea of being responsible for a constituency, as well as to that constituency, really resonated with me, as young as I was. I knew I didn't

want to be in public office, but I wanted to be in public service somewhere. Even after that, I still didn't know what I was going to do with myself. I spent some time working in the Career Center reviewing job postings and a posting for a project assistant for a CDC cooperative agreement with the Association of Schools of Public Health (ASPH) crossed my desk. I applied for the job and got it.

**Q: And did you end up with the same duties and responsibilities that you hired on for?**

**Ware:** Initially, I was hired to put together equipment, but because they didn't really have an active laboratory director, I had the opportunity to go through all the laboratories and learn operations from the bottom up. I got to see all the different kinds of work that we did. I got to meet the agency through that. I was involved in every grant. And I was always willing to do whatever was needed.

**Becker:** Because ASPH at that time was such a small organization, like you, Daphne, I got to see everything that went on behind the scenes. From the executive office to policy to administration, I had a role in all of it. Then, in 1997, Eva Perlman called me and said, "Hey, we have this job at the Association of State and Territorial Public Health Laboratory Directors (ASTPHLD, now APHL)." The Board Chair at that time thought I would maybe stay for three years and then move on, but this turned out to be my dream job. I thought the organization had such great potential to grow its influence, and I want to grow with it. Twenty-five plus years later, I'm still here!

**Ware:** I stayed in the laboratory because it is very much a family. I really, honestly cared about my coworkers, and I cared about our mission, and I just cared about making our laboratory better. I was able to

**“Our core function revolves around data, but data doesn't need to be the focus point of what get us to the table.”**



*Daphne Ware, PhD  
President, APHL*

see that in other people and it just was a good fit for what I wanted out of life.

**Q: How do you both envision APHL ushering in new generations of laboratory directors, laboratory workers, administrators and public health community members?**

**Ware:** I think APHL's in a great position to help provide that initial guidance that's needed for our new public health laboratorians. The culture within the laboratory is changing; I think there's more fluidity in jobs now, and people are more willing to cross-train or transition between jobs. Having APHL be that foundation of information and standards is going to be tremendous as we maneuver through our current recruitment processes for new directors and laboratorians. When I first joined the Mississippi laboratory, I didn't know

anything about public health laboratories and I didn't know anything about APHL. But my colleagues told me to "Look on this website, here's information you need to use." That was my introduction to APHL, and I remember I was so excited about it that I went and showed other people. And after I went to my first annual conference, I had this huge list of things I wanted our laboratory to accomplish.

**Becker:** I think APHL's place in the world has changed. And I think that can only help inspire, encourage and engage others. I believe the association is more open to push the envelope even more and to be more for our members and the public health community. We're involved in dialogues, conversations and engagements at a very different level than before. Our voice has always mattered, but we had a little voice. Now our voice is much bigger—not outsized, not bleeding edge—but leading edge, and that's a good place for us to be.

**Q:** As President of APHL and CEO of APHL, how do you iterate your positions going forward?

**Ware:** It seems like APHL continually inspires the public health laboratory community to grow. But I think APHL prevents us from being stagnant. I think that we, maybe a long time ago, had that capacity to where we just kind of did our set goals for our state. But now we see how collaboration is needed and how we do need to modify what we're doing. In the past, it used to be data would bring us to the tables of power with executives and state response teams, among others. But it seems like since COVID-19 our data have not held as much interest. So that's a whole different thought process for public

health—if we're not about bringing the data, what do we bring? Our core function revolves around data, but data doesn't need to be the focus point of what gets us to the table.

**Becker:** Right. We don't have to wait for an outbreak. There are things that we could probably be thinking of and just do it. It means thinking of our system differently. For example, APHL internally struggled with the conversation about where we fit in with health equity for years—we couldn't really figure it out. And then it was laid bare in the pandemic, and it was so obvious to us that we have a role in ensuring there are no testing deserts; that we are, in fact, with sequencing and variant surveillance, getting at all the population. Some of it still is the data, but I think we also must begin to think about what we do differently in the future.

**Ware:** I think it goes back to that opportunity that we had talked about that we stayed because we like to grow and we like to see our organizations grow with us. Public health really provides stimulation for that growth because what you saw yourself as being a couple years ago may not be what is needed at that current time. So, the adaptability requirement I think starts with a mindset of what the top of the organization needs, then you ensure you have adaptable people who you can convince to follow you, because it is a team process. It is very exciting because we see that adaptability changing generations of employees, and it is inspirational to see how they handle it. In public health you have a different challenge every year and one that was completely unexpected.

**Becker:** You know, I take APHL's mission to heart. One of the things that we have built in our DNA is quality improvement. So I think to me that's the iterative aspect—I could not be in my role as long as I am doing the same things I did 25 years ago, 10 years ago, even five years ago. The organization is dynamic—it is a living being that evolves over time. We have been doing pandemic planning for years and I could not have imagined, or planned for, any of the challenges or opportunities that we were afforded. Laboratory science is evolving, ushering in technological change, culture change, societal change, political change. I truly believe in servant leadership, but that doesn't mean leading from behind. You must have that adaptability gene...and maybe a little bit of adrenaline. ■



*Scott Becker, MS  
Chief Executive Officer, APHL*

“ I think APHL's place in the world has changed. And I think that can only help inspire, encourage and engage others.”





# The Many **Career Pathways** in Public Health Laboratory Science

By **Melanie Padgett Powers**, writer

Denise Lopez, DrPH, did not have an easy or clearcut path leading to her current role as laboratory director of **Tulare County, California, Public Health Laboratory**.

Her story, along with so many others' tales of how they fell into—and then fell in love with—their public health laboratory career is one-of-a-kind. These are often journeys filled with opportunity, serendipity and supportive mentors.

But for every success story, there are people inside and outside of public health who don't know about

the opportunities at public health laboratories or how to access them. APHL and other public health leaders are working to change that, providing clearer, more supportive pathways into public health laboratories, then up the ladder into management, and finally to a public health laboratory director position, if desired. They are creating multiple ways to lift up employees who need more experience, leadership training, degree programs or other avenues to grow—and stay—in public health laboratories.

As a kid, Lopez loved science and set out to major in biology in college. However, at age 19, she was a single parent with a severely developmentally delayed daughter who needed around-the-clock care. Fortunately, Lopez was able to live at home with her parents, who were incredibly supportive. They took care of their granddaughter in the evening so Lopez could take night classes, first at a community college an hour away, later transferring to nearby Fresno State.

But a master's degree, let alone a doctorate, was not in her plans. She knew she needed to land a good job, preferably as a clinical laboratory scientist, after graduating college so she could pay for her daughter's care. So, in her junior year, when she recognized that she needed more clinical laboratory experience on her resume, she hatched a plan: She would get the highest grade on the first exam in her medical microbiology class and then approach her professor immediately after to ask to work in her laboratory. And, it worked—she got the best grade and connected with her professor.

That professor, Mamta Rawat, PhD, pointed Lopez to a fellowship program through the **US Environmental Protection Agency** (EPA) that would pay her tuition and a stipend as she earned a master's degree. With that support, Lopez continued her education. When she finished her fellowship and earned her master's, a trainee microbiologist position opened in the Tulare County, California, Public Health Laboratory. She was hired and completed the required six-month training program to become a state-certified public health microbiologist.

"That was the first time that I'd heard of a public health microbiologist, and I'd never even really thought of public health or understood what public health was," Lopez said.

Lopez had been familiar with the role of diagnostic testing for individual patient care. But as she learned about the wider focus of public health, she was hooked. "I saw how public health data are used for public health action at a population level, providing services

regardless of means or health insurance, and tackling problems like outbreaks or persistent diseases at a larger scale," she said. "That was just so exciting to me, and it gave me a feeling of a greater sense of purpose in what I was doing."

### Programs to Build the Pipeline

Public health infrastructure continues to face sustained erosion in funding and support. Many public health laboratories have been understaffed, underpaid and underappreciated for years, doing what they could with fewer resources. When COVID-19 arrived on US shores, laboratory personnel faced intense pressure to ramp up, despite few immediate resources. The strain has been evident in many laboratories, as staff have resigned or retired. Since the pandemic began, nearly half of the laboratory director positions—59 out of 134 member laboratories—have turned over, according to APHL.

Even before the pandemic, almost one-third of state public health laboratory personnel in 2016 indicated an intent to leave within the next five years, according to the APHL workforce report **Focus on Public Health Laboratories**. After controlling for other factors, more men and millennials (compared to Generation Xers) indicated an intent to leave. In a **2021 APHL report** examining millennials in the public health laboratory workforce, barriers to retention included salary and lack of a career path for employee growth or promotion.

In recent years, several programs have been developed or expanded to improve career opportunities for laboratory personnel. The **APHL Emerging Leader Program** (ELP) is a 12-month leadership development program for laboratory professionals. Each year, 12 to 15 individuals are selected to form a cohort class. The cohort participates in skill development workshops, networking opportunities, leadership exercises and project development.

Kim Smith, MS, joined the **Houston Health Department's Bureau of Laboratory Services** in 2013 as a microbiologist II and



**“I saw how public health data are used for public health action at a population level, providing services regardless of means or health insurance, and tackling problems like outbreaks or persistent diseases at a larger scale. That was just so exciting to me...”**

*Denise Lopez, DrPH*

has worked her way up to her current role as laboratory supervisor of compliance. In her previous role as a microbiologist IV, she was in an administrative role as a quality control officer. She started getting involved and interested in the larger public health context of what the laboratory provided the community.

Smith was accepted into the 2020 ELP cohort. While the pandemic forced her cohort to become virtual-only, that didn't dampen the experience. If anything, she was more immersed in it with weekly Zoom meetings. One of the most valuable aspects of the program, she said, was identifying your work personality and learning how to work well with others based on different work personalities.

It was helpful, she said, "just learning about leadership in general, and what those characteristics are and making sure



“

For laboratories that are lacking expertise in existing areas, adding a fellow onto your team can allow you to expand the reach of your services, as well as the opportunity to shape the next generation of scientists”

*Gretchen W. Cote, MS*

that if I don't possess them, that I at least try to change the way that I think. The type of leader that you are is important because you shape others and others are looking to you for direction. So, I want to make sure that I'm investing in myself so that I can be the best leader for everyone who is in my organization, and ELP helped me define that a little bit more.”

Each ELP participant is paired with a coach, which has also been valuable for Smith. Having a coach “teaches you how to approach certain situations and solve it yourself with the direction of your coach, or with someone just asking you the right question,” she said.

When Andrew Cannons, PhD, HCLD(ABB), current laboratory director of the **Florida Department of Health's Bureau of Public Health Laboratories**, was accepted into the 2010 ELP cohort, he had a lot of career experience but not any specific leadership training.

After earning his PhD at the University of Bradford in the UK, he moved to the US in 1987 for a postdoctoral position at the University of South Florida (USF) to study how plants use nitrates as a nitrogen source. Nothing to do with public health.

In the late 1990s, the state's public health director at Tampa, Philip Amuso, PhD, was completing his PhD at USF and asked Cannons if he could sit in on his undergraduate molecular biology class. Amuso also did some research projects in Cannons' lab, and the two became friends. When Cannons began to look for new job opportunities, Amuso told him about a new role as scientific director of the Center for Biological Defense, a new US Department of Defense project based at USF looking at biological defense techniques. His laboratory and office would be housed in the state public health laboratory's building, making it easy for the two organizations to assist each other when needed.

As Amuso planned for retirement, Cannons began to consider becoming the new laboratory director and earned his high-complexity laboratory director certification. In 2012, he became director, with ELP providing him leadership training the year before.

Eleven years later, now as a director, Cannons has encouraged several employees to apply for ELP. So far, five of them have gone through the

program and remained at Florida public health laboratories.

ELP is clearly developing future public health laboratory leaders. As laboratory scientists consider future career opportunities—moving into managerial and supervisory roles—they will need the leadership skills that come with managing a budget, motivating staff, advocating for funding, building relationships with external partners and understanding legislative processes.

After going through the program, Smith, who now has two direct reports, is contemplating her career goals, which may include earning her doctorate so she can become a laboratory director.



Andrew Cannons, PhD

"I think people should apply for ELP especially if you want to be in a leadership role because you need that core training," Smith said. "It helps you see yourself in a different way and establishes the foundation of leadership; it's not just a job title that makes you a leader."

### Expanding the APHL-CDC Fellowship Program

Another program that has helped recruit, educate and retain people in public health laboratories is the laboratory fellowship program offered in partnership by APHL and the [Centers for Disease Control and Prevention](#) (CDC). The program trains and prepare scientists for careers in public health laboratories. The fellows focus on areas that include bioinformatics, environmental health, food safety, infectious disease, newborn screening, informatics, quality management systems and biorisk management.

In 2021, APHL received federal American Rescue Plan funding that allowed it to dramatically expand the fellowship program, benefiting the fellows, the laboratories and the public health workforce overall. Currently, there are 137 fellows in 36 states, representing approximately 45 laboratories. Before the pandemic, there were approximately 20 fellows in as many laboratories.

The [New Jersey Division of Public Health and Environmental Laboratories](#) has been hosting one or two APHL-CDC fellows per year for about 15 years. However, in 2022, the division is hosting 10 fellows, thanks to the new federal funding. Other new funding has allowed the division to hire more staff, which means more mentors for the fellows, explained Laboratory Director Thomas Kim, MD, PhD. In addition, the division used COVID-19 funding to create its own postdoctoral fellowship program, which currently has two fellows.

The benefits to the laboratory are numerous, beyond growing the workforce. During their one-year fellowship—with the option to extend it to two



**“[The Emerging Leader Program] ... helps you see yourself in a different way and establishes the foundation of leadership; it's not just a job title that makes you a leader.”**

*Kim Smith, MS*

years—the fellows undertake public health initiatives that the laboratories often don't have the resources to do.

"For laboratories that are lacking expertise in existing areas, adding a fellow onto your team can allow you to expand the reach of your services, as well as the opportunity to shape the next generation of scientists in a way that is most beneficial to your laboratory and public health in general," said Gretchen W. Cote, MS, bioinformatics principal scientist, [Department of General Services, Virginia Division of Consolidated Laboratory Services](#).

Kim highlighted another benefit that might not seem as obvious to laboratories newer to the program: the effect on staff morale. Fellows bring an excitement to the laboratory, with fresh ideas and enthusiasm, he said.

"From a job satisfaction standpoint, our current employees enjoy mentoring fellows; that's kind of a value-add to their job, even though it's a little more work," he said. "It gives our staff the opportunity to be mentors and teach."

The program also promotes knowledge sharing throughout the laboratory, with fellows providing regular updates and presentations. "It really creates a nice collaborative environment where people are learning about different areas of the laboratory," Kim said.

In addition, the public health community, in partnership with APHL and CDC, is very supportive of the public health fellows, Cote said. "Participating in the fellowship program as a host allows you to become part of that community to the ultimate benefit of not only your laboratory, but your fellow."

It also feeds the laboratory pipeline directly. In New Jersey, several fellows have stayed on as employees. Three of the current project managers were once APHL-CDC fellows in the department. Another former New Jersey fellow is now a laboratory director in another state.

Victoria Stone, PhD, is a former fellow who stuck around. With an interest and background in antimicrobial resistance (AR) she became an AR fellow at the [Tennessee Department of Health Laboratory Services](#) in 2017.

After her one-year fellowship, she was hired by the laboratory for her current role as a consultant in the molecular department. She also now mentors the new AR fellow. "Coming from being a fellow, I can relate to what they're going through, and I can build strong relationships with them," she said. "I can give them a lot of feedback because I've been where they've been. ... I think a lot of the fellows that are coming in are coming straight out of school like me and don't really have a lot of work experience or don't know that much about public health. So, me being able to help them learn and become

confident in their skills and knowledge is rewarding. It's nice to be a part of that."

In Virginia, Christian Alcorta, MS, is a second-year fellow of newborn screening data analytics and bioinformatics, under Cote's mentorship. A biology major and math minor with an interest in coding, Alcorta completed a master's degree in bioinformatics in August 2020. His primary fellowship project is to revamp the laboratory's second-tier assay for cystic fibrosis. He hopes to stay in the Virginia laboratory after his fellowship ends next summer.

"I really, really love the people that I work with and the environment that I work in," he said. "As long as I continue feeling like I'm learning new things, I plan on staying because it's a very good work environment, and everyone is extremely supportive."

The fellowship is Alcorta's first experience working in public health, but likely not his last. "I knew next to nothing about public health. ... It was

not really something that I had thought much about, and now being in that environment, it definitely is something that I care about and feel strongly about."

He likes that his work has a real-world impact on people; in this case, screening newborns for diseases. "It has made me feel more strongly about public health and made me feel more inclined to stay in public health," he said.

### Providing a Path to a DrPH

As people rise through the ranks in laboratories, there is one requirement that can stop them in their tracks. Without a doctoral degree, they often cannot become a high-complexity laboratory director because they do not meet the requirements for board certification or to oversee the Clinical Laboratory Improvement Amendments (CLIA) regulations.

In California, Lopez would likely have hit that career ceiling. With a family dependent upon her income,



**“Coming from being a fellow, I can relate to what they’re going through, and I can build strong relationships with them.”**

*Victoria Stone, PhD*

## APHL STRATEGIC INITIATIVE GROUP (SIG): WORKFORCE RECRUITMENT AND RETENTION

The APHL Board of Directors convened the Recruitment and Retention Strategic Initiative (R&R) with the charge to address **2021–2023 Strategic Map** objectives B1 “Support member recruitment and retention efforts” and B3 “Explore partnerships with academia.” SIG members include APHL representatives from the Workforce Development Committee, state and local public health laboratories, academia and APHL staff. They identified specific tasks, as well as collected resources and data from APHL members and the association to explore:

- **Why people select or not select careers in public health laboratories:** The SIG is examining APHL’s workforce data and identifying data gaps, which will lead to evidence-based recruiting and retention practices.
- **Information campaigns targeting college students to make them aware of careers and experiential learning in public health laboratories.** Successfully used recruitment materials have been collected.
- **Tools and pilot projects for public health laboratories to partner with academia.** Tools assembled to date include model MOUs with academic institutions. In addition, a comprehensive list of online certificate programs related to laboratory practice is being collated, and support for local academic partners to attend APHL Annual Conference and other conferences is being developed.
- **Assisting members in addressing the compensation gap between public health and other employers in the laboratory community.** Recognizing the “elephant in the room,” SIG members are finding examples of public health laboratory leaders who have successfully improved salary scales for laboratory staff. These will be collected and made accessible. A guide to navigate federal student loan forgiveness for public health laboratory professionals is also being explored.
- **Increasing opportunities for professional development and a mechanism to manage a personal portfolio of professional development activities for public health laboratory employees.**

she could not interrupt her full-time public health laboratory career to move somewhere to obtain a PhD. The nearest doctoral program is 200 miles away.

But that's where the University of South Florida came in. In 2017, USF accepted its first cohort of students into its new **doctor of public health (DrPH) program** focused specifically on public health and clinical laboratory science and practice—the only one in the country focused on laboratories. The program was purposefully developed to be mostly online, allowing current public health laboratory employees to earn their DrPH while staying in their current roles.

Several public health leaders united to campaign for such a program after a 2011 workforce survey from APHL and the University of Michigan illustrated major pipeline issues. More than half of public health laboratories expected up to 15 percent of their workers to retire or leave within five years. They cited the two most common barriers to recruitment as lack of opportunities for promotion and lack of a career path for advancement.

USF was a good fit for a new program. “We already had an existing DrPH program that was in leadership, and that program is also 100 percent online because the program wants to attract people who are already working in the field,” explained Jill Roberts, PhD, MS, MPH, CPH, director of the DrPH program and associate professor in the **USF College of Public Health**. “We recognize that we can’t pull those people out of their jobs. The whole point of the program is for them to advance in their jobs, not to disrupt their careers.”

USF has been a leader in online education, Roberts said, also offering an online Graduate Certificate in Infection Control program that is the largest certification program for the College of Public Health.

**“From a job satisfaction standpoint, our current employees enjoy mentoring fellows; that’s kind of a value-add to their job, even though it’s a little more work,” he said. “It gives our staff the opportunity to be mentors and teach”**

*Thomas Kim, MD, PhD*

The DrPH laboratory program continues to grow, from a handful of students admitted each year to its largest class of 10 students starting in fall 2022. New scholarships through APHL from American Rescue Act funds are partially responsible for the increase. The scholarships pay tuition plus a stipend, which can help cover the travel costs for the three required one-week on-site institutes at USF. Several of the past two years’ cohorts are receiving funding. (Roberts welcomes any questions about the DrPH program: [jcrobert@usf.edu](mailto:jcrobert@usf.edu).)

Since 2017, five students have graduated from USF with their DrPH and three have become laboratory directors. More directors are expected as they graduate—and no longer hit that career ceiling.

“The public health laboratories are underappreciated, they’re underfunded, and the individuals who work there are underpaid,” Roberts said. “So for us to be able to give them an opportunity to see some fruits of their labors in their dedication to those laboratories is fantastic.”

From her home and office in the Central Valley of California, Lopez earned her DrPH and passed her boards. She became laboratory director on August 1, 2022. She had been managing the laboratory while their retired former director stayed on part-time to serve as the CLIA director.

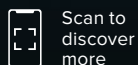
Her DrPH has not only helped her career, it has given her laboratory more stability with a full-time director who has no plans to leave the area she grew up in. And it’s filled in a missing educational piece, offering an opportunity to her laboratory staff who were able to earn a bachelor’s degree nearby and a master’s in public health online but didn’t have a feasible doctorate option.

“Especially when you’re talking about upward mobility for people that live in traditionally underserved areas, rural agricultural communities, the key to that upward mobility is access to higher education,” Lopez said. “And this was a piece that was missing for our laboratory and so many other laboratories that are located far away from universities. It opens the door not only for the laboratory to have a sustainable path of succession for highly qualified individuals, but also to lift up members of our existing community, as opposed to just relying on recruiting talent from without.” ■

# Be Prepared for the Unpredictable



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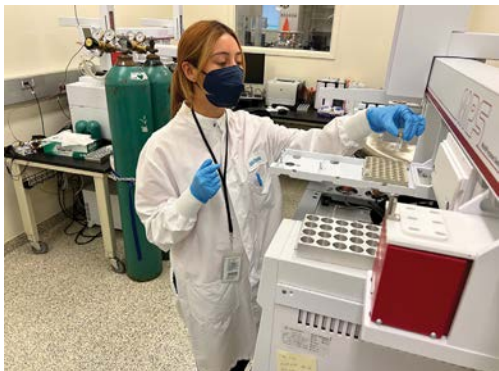
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# Environmental Health Laboratory Fellows Make a Difference

By **Erin Morin**, MHS, specialist, Environmental Health

The *Environmental Health Laboratory Fellowship* trains and prepares scientists for public health and environmental laboratory careers and supports human exposure projects through targeted environmental or biomonitoring surveillance. Its mission is to provide a high-quality training experience for the fellow, and expand public health laboratory workforce capacity. During the first round of recruitment, four fellows were placed in laboratories across the country.

## Isabel Bayas New Jersey Department of Health (NJ DOH)



Isabel inserts samples into the HS-SPME GC-MS for analysis.  
Photo: NJ DOH

I am developing a method to quantitate terpenes in medical cannabis to support a new state regulatory requirement that medical cannabis does not exceed 10% of the product. Terpenes, which may be a danger in high concentrations, are volatile compounds found in plants, fruits and vegetables that can provide health benefits—including anti-inflammatory, anti-fungal, and analgesic properties—at low concentrations. They are a naturally-occurring compound responsible for the aromas, flavors and colors associated with vegetation and are what give certain cannabis strains their distinct smell or taste. My method identifies 36 of the most common of terpenes found in cannabis by using headspace solid phase

microextraction gas chromatography mass spectrometry (HS-SPME GC-MS).

The fellowship program is a perfect fit for me as I start my professional career. I received my bachelor's in chemistry with a focus in forensic science and was fortunate to be placed in the Chemical Threat Laboratory, which tests Schedule One drugs. I am driven by this field because it allows me to obtain a variety of analytical and technical skills I can apply to future research projects in my forensic chemistry career. I also feel that, by developing this terpene method, I am helping doctors and prescribers have access to data that allows them to know the quality of the cannabis they are prescribing.

“Isabel’s position has been invaluable in adding to our workforce and developing the terpene method. She has made great progress in developing the terpene method for our cannabis program. She is a fast learner for GC-MS and she will be trained on liquid chromatography quadrupole time-of-flight as well. I would like to personally thank APHL for supporting this program.”

— **Daniel Wene, MS, research scientist 3 and mentor, NJ DOH**

## Burabari Bornu North Carolina Department of Health and Human Services (NC DHHS)

My overall project goal is to optimize, validate and use a digital polymerase chain reaction (dPCR) method for the quick identification and enumeration of *Legionella pneumophila*. Extraction platforms will be compared to assess DNA recovery and the influence of PCR inhibitors, which are commonly found in water. An internal/extraction inhibition biocoid control is used to identify



Burabari prepares a plate for extraction of *Legionella* DNA.  
Photo: NC DHHS

inhibitors to ensure the best data. Finally, a dPCR system will increase sensitivity due to discrete measurements of nucleic acid amounts and allow for quantification. This new method is less time-consuming than the previous one and will allow for a quicker turnaround time, producing results in 24 hours compared to several days.

The fellowship program has been a good fit for me because I wanted to work on something complex but not overly well-known, and *Legionella* falls into this category. When I read about the project, I was intrigued. Additionally, North Carolina’s weather is similar to that of Georgia, which was a win. I am driven to do this work because people tend to forget that public health affects each one of us every day.

“Burabari allowed us to optimize and validate a test that might not have otherwise seen the light of day. Short staffing leaves little time to bring on new methods, and Burabari has produced an amazing amount of data in a short period of time. It’s awesome to see Burabari walk into the laboratory every morning excited and looking forward to making progress on the validation, knowing that this method will allow for a more timely response to *Legionella* outbreaks and could ultimately save lives.”

— **Chris Goforth, MS, environmental sciences manager and mentor, NC DHHS**

**Alexia (Lexi) Duncan**  
**Wisconsin State Laboratory of Hygiene**



Lexi collects air samples (gas-phase and aerosols) for PFAS analysis using a high-volume air sampler. Photo: Wisconsin State Laboratory of Hygiene

My project entails first building field and laboratory expertise in per- and polyfluoroalkyl (PFAS) science by learning, developing and applying methods for sampling and laboratory analysis of various environmental matrices (i.e., precipitation, air, soils and sediments, and wastewater) for 33 PFAS. Then I will bring on a method to analyze these samples for total organic fluorine (TOF) using combustion ion chromatography—a novel method that will provide a general measure for total PFAS. Finally, I am developing talking points for the regulatory and scientific community on how TOF can be used to advance regulatory and science goals.

The fellowship has been an excellent fit and has enabled me to continue my education with a hands-on approach. It has also allowed me to network with people from different environmental fields. The best part about my fellowship is processing samples from field collection through sample analysis. The driving factor for my work is knowing I am identifying an environmental contaminant that is causing harm to people and the environment. This work,

the fellowship, and, in turn, the Wisconsin State Laboratory of Hygiene has given me a purpose in my life and allows me to help protect environmental public health.

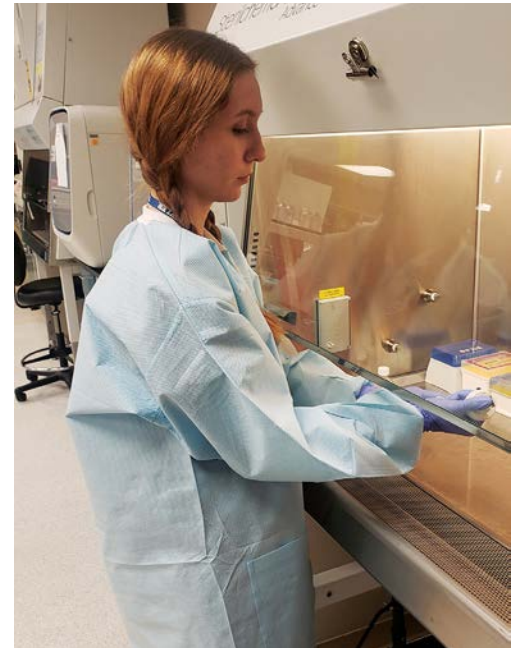
“Lexi’s positive impact on the laboratory cannot be overstated. She has integrated herself into several new and exciting PFAS-focused initiatives, allowing us to push forward more effectively on those projects and document successful outcomes for study sponsors. Her energy knows no bounds and her willingness to take on new projects helps advance and showcase the laboratory’s capabilities. And last, but certainly not least, her positive attitude, work ethic and team-centric skills set an infectious example for others at the laboratory.”

— Martin Shafer, PhD, senior scientist, research lead and mentor, Wisconsin State Laboratory of Hygiene

**Guinevere Ellison-Giles**  
**Public Health Laboratory of East Texas (PHLET)**

We have established a wastewater-based epidemiology program to detect SARS-CoV-2 trends in seven counties of Northeast Texas. I help identify and recruit wastewater treatment facilities (WWTF), extract wastewater, manage data and conduct epidemiology analyses. This work is done in collaboration with WWTFs and our regional health department.

With an environmental health professional background and an infection control academic background, this project marries two fields I am passionate about and is a perfect fit for me. The cliché answer to what drives me to do this work is to say my desire to help people. But that sentiment is true, not just for me, but for most people in the public health field. I am lucky I found a field that helps others and happens to be incredibly fascinating and exciting work. ■



Guinevere prepares wastewater samples under the hood, following proper safety precautions. Photo: PHLET

“The fellowship has had a positive impact on PHLET by helping to build the wastewater monitoring program in Northeast Texas in multiple ways. The data have been able to assist partners in assessing the community prevalence of COVID-19 outside of hospitalization and determine next steps needed for response activities. Guinevere has assisted with the wastewater sampling design, collection and processing. She has also helped us expand the number of WWTFs and to assist with data recording, management and analysis. Lastly, Guinevere’s presence and willingness to learn has encouraged us to establish a monthly wastewater journal club and a professional development group. These activities have helped us to disseminate the information locally to our public health partners.”

— Michelle Crum, PhD, responsible official and mentor, PHLET

# Reimagining and Rebranding for the Future of Food Safety

By **Adom Yusuf**, specialist, Food Safety; **Robyn Randolph**, senior specialist, Food Laboratory Accreditation; and **Kirsten Larson**, manager, Food Safety

**APHL promotes the role of state and local public health and agricultural laboratories in the detection and characterization of foodborne pathogens in both clinical specimens and food and environmental samples, and works with member laboratories as they perform robust surveillance testing and outbreak detection and prevention activities.**

Since the first cooperative agreement with the **US Food and Drug Administration** (FDA) in 2012 to assist food testing laboratories in expanding accreditation to the ISO/IEC 17025 standard, APHL and its membership have grown to include more human and animal food testing laboratories. To keep pace with the rapidly evolving landscape of food safety, APHL's Board of Directors (BOD) stood up a task force in December 2020 to better engage APHL's current Public Health Associate Institutional (PHAI) members (agricultural and environmental laboratories) and brainstorm how to attract additional PHAI members.

To better address human and animal food testing issues within the association, the BOD Task Force endorsed the elevation of the Human and Animal Food Subcommittee to an advisory committee in July 2022. The Human and Animal Food Committee (HAFC) will now better represent the broad-ranging issues related to food testing and the diverse services of

agricultural laboratories. HAFC will cover a multitude of pertinent topics, including:

- Microbiological, chemical and radiological testing of food.
- Whole genome sequencing of food and environmental samples for GenomeTrakr.
- Hemp and cannabis testing in edible products.
- Allergens in food.
- Per- and polyfluoroalkyl substances (PFAS) in food.

In addition to this exciting change with HAFC, the Food Safety Committee was renamed the Foodborne Diseases Committee (FDC) to better reflect its work focusing on clinical testing for infectious foodborne pathogens. Issues FDC will address include but are not limited to:

- Implementation of next generation sequencing methods.
- Public health uses of metagenomics.
- Implications of culture-independent diagnostics.
- Viral and parasitic foodborne pathogens.
- Diagnostics/surveillance for (re) emerging foodborne pathogens.

APHL is committed to maintaining connection and coordination between FDC and HAFC. Staff aims to schedule an overlapping day at committee in-person meetings and ensure HAFC and FDC staff liaisons participate in both committees' calls so that issues of mutual interest are addressed from multiple perspectives.

APHL has always worked closely with members and federal partners at the **US Centers for Disease Control and**

"The [reimagining of these committees] demonstrates our membership's dedication to addressing food safety through the lens of One Health. [And their separation] will provide more focused membership input to collaboratively strengthen the food systems we have, manage food safety risks and respond to incidents and emergencies."

— Daphne Ware, PhD, APHL president

**Prevention**, FDA, and the **US Department of Agriculture Food Safety Inspection Service** to advance laboratory practices by increasing the competence of laboratory staff, improving the capabilities of member laboratories, and strengthening the defensibility of laboratory data. Through these two advisory committees, the association plans to expand efforts into:

- Antimicrobial resistance, wastewater surveillance for enteric pathogens.
- Interoperability of next-generation sequencing data.
- Foodborne illness source attribution, outbreaks of undetermined etiology.
- Chemical risk analyses (i.e., PFAS, cannabis, heavy metals, etc.).

The committees will continue to expand collaboration with federal partners and across APHL, and will continue to evolve and positively impact public health by meeting the needs of diverse member perspectives. ■

# It's Time for Global Health Data Innovation

By **Reshma Kakkar**, informatics manager, Global Health; **Matthew McCarroll**, lead specialist, Global Health; **Natalie Martinez**, specialist, Global Health; and **Hewan Moges**, associate specialist, Global Health

In the last three years, the world has come to rely on laboratory data more than ever before. As a result, the demand for timely and quality laboratory data has grown exponentially. With millions of tests being conducted in the US and globally—and emerging infectious diseases coming from zoonotic sources worldwide—the **US Centers for Disease Control and Prevention** (CDC) recognized the need to expand data modernization efforts beyond state and local entities in the US to countries in Asia, Africa and Central/South America.

APHL's goal is to help bridge gaps driven by siloed systems and lack of standards

that prevent sharing and utilization of data in public health, which can impact decision making. APHL is partnering with CDC on the Global Public Health Data Innovation program (GPHDI), which aims to support 10 countries with data modernization efforts. APHL is collaborating to provide support by using tried and trusted methods of technical assistance teams, the AIMS Platform, electronic laboratory reporting and the standardization of data exchange terminology. Through this effort, APHL will expand data modernization efforts and implement targeted approaches with each country.

This targeted approach will enable APHL and local health leaders to form customized roadmaps and long-term goals for improving laboratory data exchange and data flow, while also addressing workforce development. APHL will work with each country to develop and plan for a scalable laboratory system that allows data to flow securely and efficiently from the laboratory to target destinations, such as surveillance databases, so outbreaks can be detected and tracked more efficiently. This enhancement of the laboratory system will provide better health outcomes for citizens and provide health leaders with quicker and more accessible data. ■

# Tanzania Launches International Biological Safety Cabinet Certification Training Program

By **Aika Mongi**, director, APHL Tanzania and Lucy Maryogo-Robinson, director, Global Health

Infectious disease outbreaks highlight the need for safe handling of infectious materials and to institutionalize programs for servicing biological safety cabinets (BSCs) globally. Comprehensive workforce programs within local institutions are critical for biosafety but are severely lacking. Until May 2022, if one wanted to learn how to certify BSCs on the African continent, one had to travel to North America or North American experts had to travel to Africa. To make this craft more accessible and sustainable, APHL, the **US Centers for Disease Control and Prevention** (CDC), subject matter experts (SMEs), and Tanzania's **Muhimbili University of Health and Allied Science** (MUHAS) collaborated to create a hybrid course delivering an asynchronous curriculum online and hands-on learning in Dar es Salaam. The course covers all one needs to know to successfully complete the **NSF Basic Accreditation Field Certification** tests.

To ensure the course could be offered annually, the program began by training instructors at MUHAS. It was not easy: pandemic travel restrictions forced us to get creative and train the instructors virtually. In May and June, our SME and the instructors piloted course materials with MUHAS undergraduates, then officially launched the course with field certifiers from Ethiopia (3), Kenya (2), Nigeria (1), Rwanda (2) and Uganda (2).

The participants completed hands-on training in June in Dar es Salaam at a training space provided by **Tanzania's National Public Health Laboratory**. Some course participants stayed on to complete NSF Basic Accreditation testing, along with course instructors and other field certifiers in the region. Fourteen field certifiers from the public (13) and private (1) sectors completed accreditation testing. Eight field certifiers passed every test and are now listed as **NSF-accredited certifiers**. The rest are eligible to retest after 90 days, and some already have.



Instructors receive BSC training

Going forward, the course will be offered annually through MUHAS along with NSF Basic Accreditation testing. Our initial numbers may be small, but this is no small feat: we are making biosafety in African laboratories more achievable. ■

# A Private-Public Collaboration for Safely Reopening Schools in Hawaii

By **Sean Romigh**, MBA, diagnostic project implementation manager, PerkinElmer, Inc.; **John Hicks**, clinical sales manager-North America PerkinElmer, Inc.; **Andrea Feher**, MBA, manager, Marketing, PerkinElmer, Inc.; **LeeAnn Dennewitz**, senior vice president, Strategic Alliances & Partnerships, PerkinElmer, Inc.; **Amy M. Woron**, PhD, MPH, MS, M(ASCP)MBCM, director, Microbiology and Molecular, Diagnostic Laboratory Services, Inc.; and **A. Christian Whelen**, PhD, D(ABMM), vice president and technical director, Microbiology and Molecular Laboratories, Diagnostic Laboratory Services, Inc.



Photo: Diagnostic Laboratory Services, Inc. (DLS) in Hawaii

With COVID-19 surging across the United States and the globe, the federal government created the **Operation Expanded Testing (ET)** program in summer 2021. This program's mission provides underserved communities with no-cost COVID testing. The program geographically split the United States and its territories into four hubs. PerkinElmer, Inc. was selected to provide services for Hub-1 West—an expansive geographic responsibility that covers eight time zones (Figure 1).

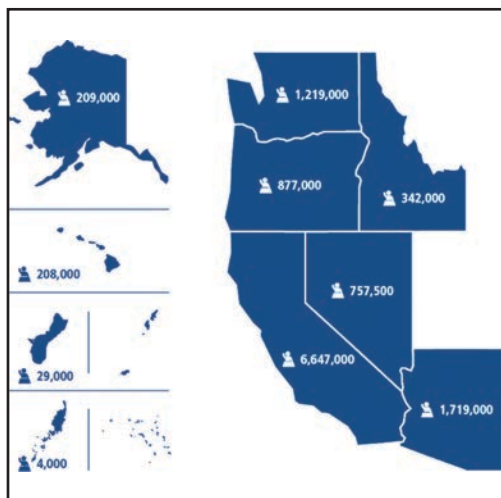


Figure 1. Geographical testing region, Hub-1 West

## Collaboration on a Grand Scale...

To complement PerkinElmer's robust supply chain for reagents, consumables and instruments, we collaborated with proven companies that provided local and national capabilities. The focus on local support was pivotal in the adoption of Operation ET in Hawaii. The program launched with PerkinElmer performing outreach to the state **Department of Health** (DOH) and those in the community that would benefit. Those interested organizations would sign up for the program, receive training and have collection kits delivered to their sites. The software platform, provided by **Color Health**, allowed individuals and testing sites to easily access data and manage site operations. To ensure reliable sample shipment, UPS was selected based on their ability to deliver in under 48 hours to the testing laboratory located in California. During the months of August through October 2021, the program provided results for over 23,000 individuals.

During the initial months of the program, the Hawaii DOH advised PerkinElmer that if a local laboratory was added to the program, it would increase school adoption as the Department of Education

preferred testing to be performed on-island. As a Diamond level sustaining member of APHL, PerkinElmer contacted Scott Becker, chief executive officer, to assist in identifying a solution for this project.

"During this difficult time, we were thrilled to hear of PerkinElmer's award and proudly recommended one of our corporate members, **Diagnostic Laboratory Services, Inc. (DLS)**," said Becker. With his encouragement, PerkinElmer negotiated terms to deploy instrumentation, reagents and consumables that would be operated by the laboratory team at DLS. As part of the integration process, there were coordinated efforts between the partners for data systems integration, vendor quality assessments, instrument installation and workflow training. Additionally, the change in laboratory location resulted in a reduction in transit time to 24 hours.

## ...And Closer to Home

Testing at DLS launched in late October 2021 and provided testing for roughly 25% of Hawaii's sites.

"As Hawaii's largest locally owned and operated laboratory, we understand the local culture and desire for local testing," said DLS President Mark Wasielewski. "Facilitating access to accurate and timely testing is a core competency of DLS."

The team then began to phase in additional sites based on the available laboratory capacity. As the team planned to complete the transition to 100% on-island testing, the Omicron variant surged. This put a temporary pause on transitions while the network of laboratories managed the increased sample volume coupled with high positivity rates. At the end of the first four

months, the total number of individuals who received results in Hawaii increased to over 53,000.

As spring approached, the schools extended their use of Operation ET to include special events. This was possible because of the consistent ability to deliver results in less than 40 hours from collection. Activities like sporting events, field trips, school dances and spring break programs that required testing within 48 hours of the activity were now possible. One particularly special event for the children of Aikahi Elementary School is the annual weekend camping trip at Camp Erdman. Unfortunately, this cherished tradition was not possible for two years due to the COVID-19 pandemic.

"I was committed to having this special trip take place for the benefit of our students, families and staff," commented Principal Keoki Fraser. "Implementing COVID-19 testing using Operation ET allowed us to enjoy the activities safely. Without the support of this testing, we would not have been able to go to camp and our students would have missed the opportunity to create lasting memories with their classmates."

With the continued need for testing, the federal government extended the Operation ET program until the end of 2022. While the future of COVID-19 remains uncertain, the framework and relationships needed to support an effective testing solution continues to be available for the Hawaiian Islands.

"It takes a village to implement a program as critical as Operation ET during a pandemic," said Arvind Kothandaraman, managing director of Specialty Diagnostics at PerkinElmer. "Many organizations including the US Department of Health and Human Services, CDC, Hawaii DOH, DLS, UPS, and Color Health collaborating with PerkinElmer, worked together tirelessly to deliver upon the needs of communities served by Hub-1 West." ■

*PerkinElmer, Inc. is an APHL Diamond Level Sustaining Member.*



**ABSA**  
**INTERNATIONAL**  
*The Association for Biosafety and Biosecurity*

*ABSA International was founded in 1984 to promote biosafety as a scientific discipline and serve the growing biosafety and biosecurity needs of scientists, laboratorians, health care workers, and biosafety and biosecurity professionals throughout the world.*

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# Utilizing Nanotrap Microbiome Particles to Capture and Concentrate Intact Virus from Wastewater Samples

By **Steve Kelly**, technical product manager, Streck Inc.

In response to the **COVID-19** outbreak, the **US Centers for Disease Control and Prevention (CDC)** established the **National Wastewater Surveillance System (NWSS)** in September 2020. NWSS coordinates with health departments and public health laboratories to track the presence of the SARS-CoV-2 in wastewater and has plans to expand to other microbes of interest. For SARS-CoV-2, wastewater testing has already been demonstrated as an early warning of potential COVID-19 outbreaks in a community, as those infected can shed this virus in their feces before they manifest symptoms or even are asymptomatic. The earlier a community-wide outbreak can be detected, the faster public health actions can begin. Ceres Nanosciences Nanotrap®

Microbiome Particles offer a fast and easy-to-use way to capture and concentrate a wide range of microbes—including those of interest to CDC—from wastewater samples. They are compatible with most nucleic acid extraction methods and suitable for RT-qPCR, RT-ddPCR, RT-dPCR, and sequencing-based analysis methods.

## Game-Changing Hydrogel Technology

Nanotrap® Microbiome Particles are highly porous hydrogel particles functionalized with chemical affinity baits that bind, with very high affinity, to intact microbes. The hydrogel structure facilitates rapid exchange with the solution for rapid microbial binding. Nanotrap particles

contain a magnetic component, allowing them to be pulled to a magnet for easy recovery from the solution. This process can be automated, allowing high throughput concentration of analytes (**Figure 1**).

Hydrogel technology—incorporating affinity dyes to capture low abundance analytes in solution—allows the rapid concentration of intact pathogens that contain the entire viral genome. Methods utilizing Nanotrap® particles to capture and concentrate microbes from wastewater result in better PCR and sequencing-based results. Nanotrap® Microbiome Particles replace more tedious concentration steps in the workflow, taking samples directly from raw sewage

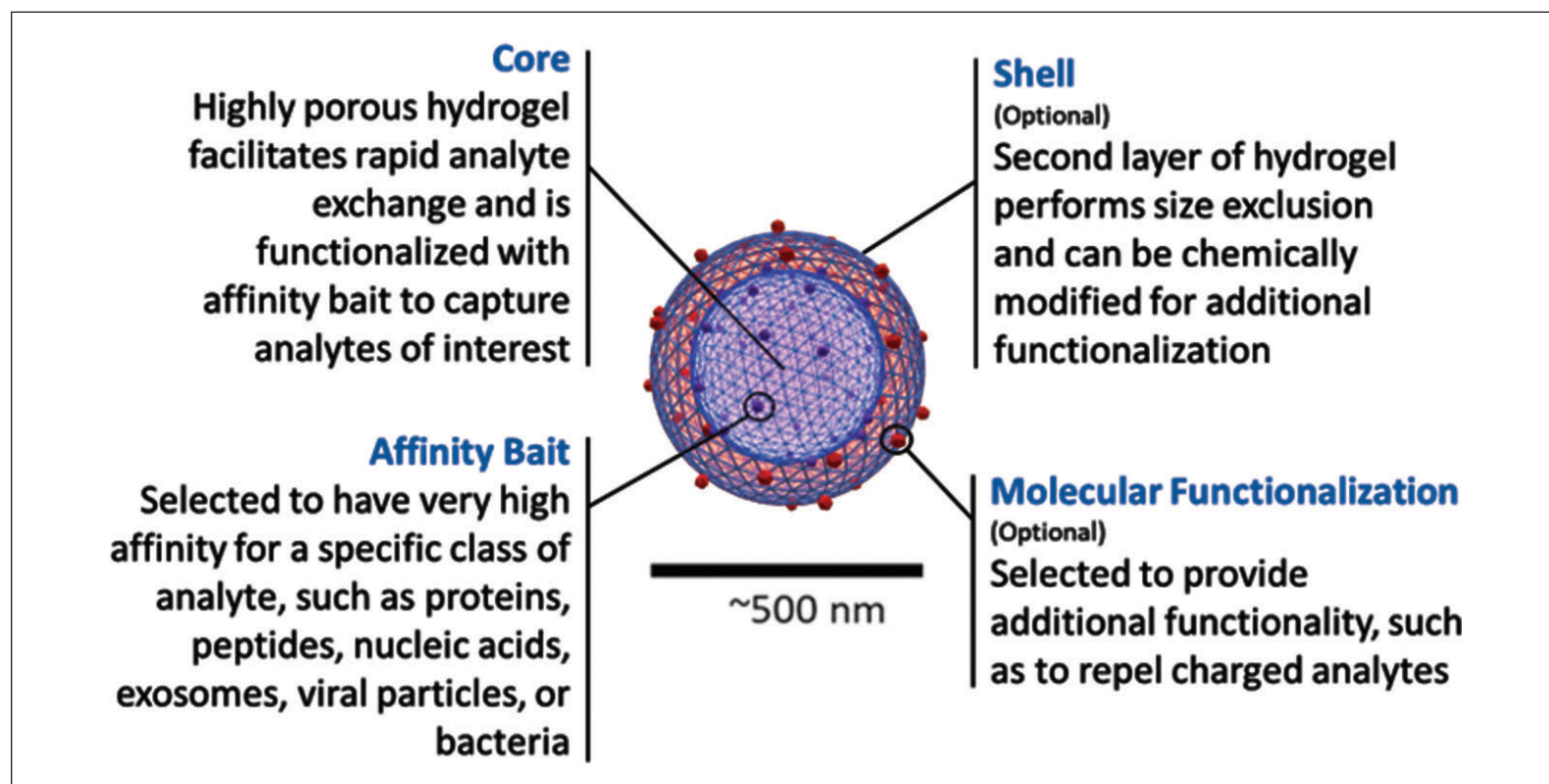


Figure 1.

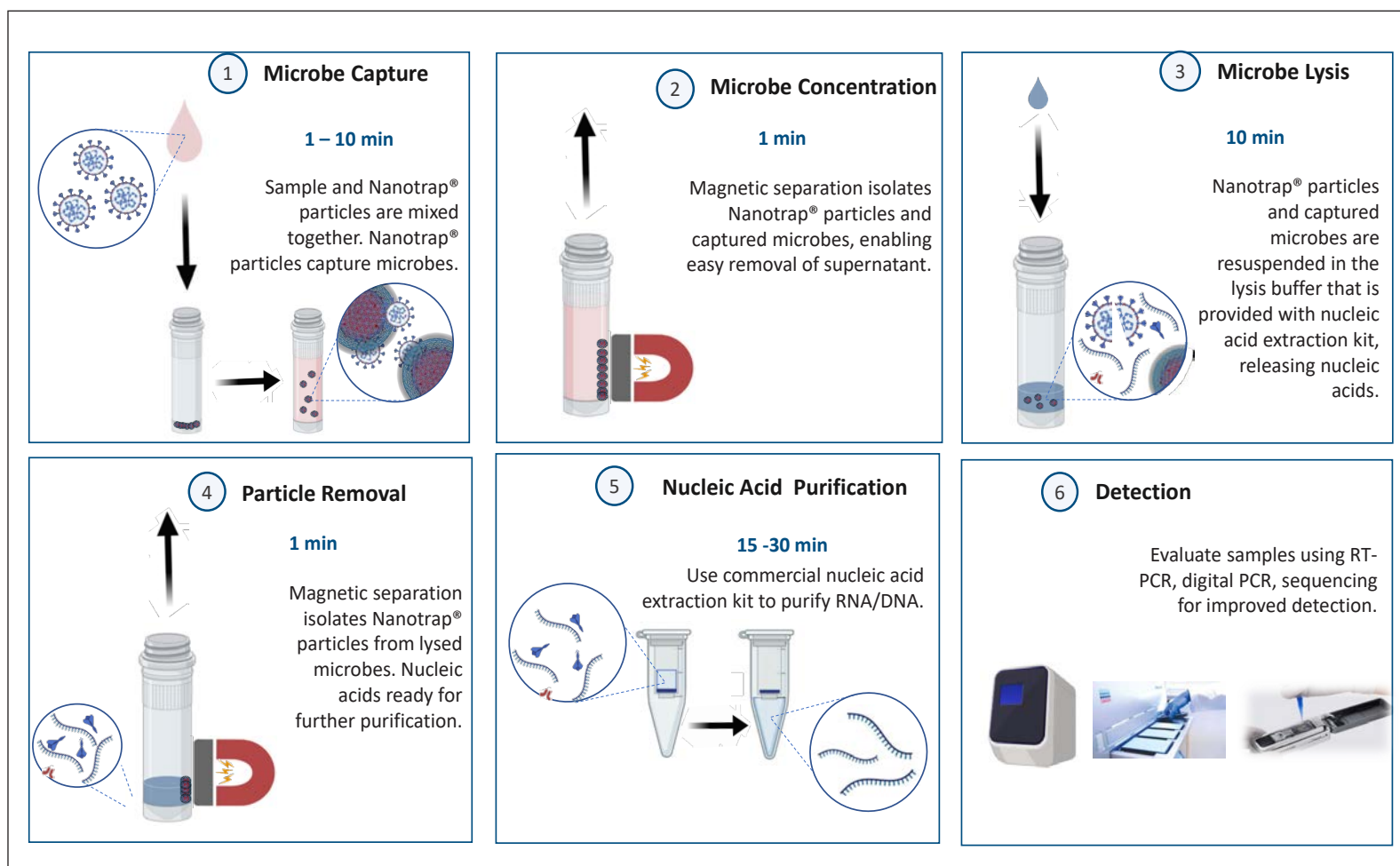


Figure 2.

to DNA/RNA extraction kits in just a few simple steps, with no centrifugation or filtration required.

### Reducing the Chance for Error in Wastewater Epidemiology

By capturing and concentrating microbes of interest, the Nanotrap® Microbiome Particles facilitate a higher yield of complete genomic nucleic acids from the same sample volume used in other processes (Figure 2). This allows for better

results and can enable earlier detection of COVID-19 “hot spots” in a community, as well as more accurate sequencing data to better identify the spread of unique variants.

Easy to use, readily scalable and inexpensive to implement, Nanotrap® Microbiome Particles have been used by numerous wastewater surveillance programs tracking community spread of SARS-CoV-2 variants and extending into others, such as monkeypox. By reducing

hands-on time, eliminating filtration and centrifugation steps, and enabling automated methods, laboratory personnel are freed to perform other tasks. ■

*Streck, Inc. is an APHL Gold Level Sustaining Member.*

# Hybrid 12th National Conference on Laboratory Aspects of Tuberculosis Convened

By Sarah Buss, PhD, D(ABMM), manager, HHST

After the COVID-19-driven quarantines of 2020 and 2021, APHL was thrilled to host the hybrid 12th National Conference on Laboratory Aspects of Tuberculosis (TB) July 12–14. Kimberlee Musser, PhD, clinical director of the Wadsworth Center's David Axelrod Institute welcomed attendees both in person and virtually for the first time in the meeting's history.

Keynote speaker Lisa Armitage, MD, PhD, medical consultant at the Heartland National TB Center and Associate Professor of Medicine and Pediatrics at the University of Texas Health Sciences Center, quickly set the tone by professing "shameless affection" for her state TB laboratory. She delivered an informative session highlighting the importance of new TB treatment regimens and the drug susceptibility tests that inform their use. On the forefront of this work, the US Centers for Disease Control and Prevention (CDC) and APHL member laboratories presented on new susceptibility testing methods, including custom Sensititre™ panels, phenotypic tests for new drugs, and a variety of sequencing-based approaches for detection of *Mycobacterium tuberculosis* resistance.

Daniela Cirillo MD, PhD, head of the Emerging Bacterial Pathogens Unit at the San Raffaele Scientific Institute and director of the World Health Organization Collaborating Centre in Tuberculosis Laboratory Strengthening in Milan, Italy, provided a European perspective and explained the challenges associated with establishing the various reference ranges (i.e., clinical breakpoints, epidemiological cutoffs and critical concentrations) required for standardization of phenotypic susceptibility tests. Later, difficulties associated with patient adherence to the standard treatment regimens and the importance of new regimens were highlighted by tuberculosis survivor Charet Wynn. Always a crowd



Yvette Vergnetti was honored with the On the Front Lines of TB Testing Award

favorite, case study presentations further emphasized the importance of delivering antimicrobial susceptibility testing data to providers, delved into challenges associated with molecular detection of TB, and gave attendees their first glance into a multi-state TB outbreak.

Sessions also drew on the challenges TB laboratories faced during the pandemic. With burnout an unfortunate reality in public health laboratories, APHL's Chief Learning Officer Christine Bean, PhD, MBA, MT(ASCP) highlighted resources available for building and retaining a sustainable workforce and CDC's Associate Director for Human Capital and Performance Mark Pope PhD, LPC, SPHR, CBT presented a lesson in self-care. Continuity of operations (COOP) during real-world interruption of service events was addressed by a panel of CDC and APHL member laboratorians who shared lessons learned when investigating, developing and implementing COOPs.

On Day 2, the awards ceremony was held, and it was a highlight for both in-person and virtual attendees. Yvette Vergnetti from the Alaska State Public Health

Laboratory was recognized for significant contributions to the advancement of TB testing with the On the Front Lines of TB Testing award. The National Tuberculosis Controllers Association (NTCA) honored Tanya Halse, Wadsworth Center, with the Ed Desmond TB Laboratorian Award for her exemplary service, dedication and leadership. Denise Dunbar (retired) from the Texas Department of State Health Services, virtually received the Tuberculosis Lifetime Achievement Award in recognition of a lifetime of



Kimberlee Musser (left) and Marie Claire Rowlinson (right) both from the Wadsworth Center watched as the NTCA honored Tanya Halse (center), Wadsworth Center, with the Ed Desmond TB Laboratorian Award

distinguished service, leadership and excellence to the field of TB diagnostics and training.

The meeting closed with a deeper look into a few of 2021's more notable TB incidents. The efforts of the US Department of Defense to screen and treat over 80,000 Afghan nationals during Operation Allies Welcome was described, and the unusual multi-state TB outbreak linked to bone allograft material was detailed from state and national health department perspectives. The session served to, once again, remind attendees of the importance of their work. ■

# 2023 APHL Conferences



## **APHL ID Lab Con 2023**

March 13–15, 2023 • Atlanta, GA

## **APHL 2023 Annual Conference**

May 22–25, 2023 • Sacramento, CA

## **13th National Conference on Laboratory Aspects of Tuberculosis**

June 12–13, 2023 • Atlanta, GA

## **Joint APHL 2023 Newborn Screening Symposium and the International Society for Neonatal Screening Meeting**

October 15–19, 2023 • Sacramento, CA

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# Strengthening Influenza Surveillance by Building Molecular Testing Capacity

By **Alisa Bochnowski**, senior specialist, Respiratory Diseases



APHL infectious disease team consultants and members of the Research Institute for Tropical Medicine, Philippines following Flu SC2 training

The Influenza Diagnostic Branch of the **US Centers for Disease Control and Prevention** (CDC) developed a real-time multiplex PCR assay for the simultaneous detection of nucleic acid from influenza A, influenza B and SARS-CoV-2 viruses: the FluSC2 Multiplex. The assay was developed under Emergency Use Authorization (EUA) protocols to increase testing efficiency and to overcome laboratory constraints—such as molecular reagents and personnel shortages—which were globally experienced during initial **COVID-19** pandemic surge testing. By testing three major respiratory viruses that cause similar symptoms, the assay not only increases testing capacity for the laboratory but also contributes further to surveillance by understanding their trends and emergence. Because APHL was unable to host regional laboratory trainings due to the pandemic, and to support the implementation of the FluSC2 Multiplex Research Use Only (RUO) assay internationally, CDC led “train-the-trainer” sessions for APHL consultants on the FluSC2 Multiplex who subsequently deployed to different countries to provide support as the new assay was onboarded.

In January 2022, CDC’s Influenza Genomics and Diagnostics Team, led by Dr. John Barnes, initiated training on FluSC2 Multiplex for a group of APHL influenza laboratory consultants.

The three-day hands-on training was conducted at CDC’s Atlanta campus and focused on the fundamentals of the assay and different troubleshooting techniques. Because not all CDC-validated devices are available internationally, the consultants also learned the RUO FluSC2 Multiplex verification process on other nucleic acid purification instruments and real-time PCR platforms including the Applied Biosystems QuantStudio™ 5 and the Bio-Rad CFX96 Real-Time PCR instruments.

To date, APHL has deployed consultants to Egypt, Jordan, Oman and the Philippines. Prior to deployment, APHL consultants worked with CDC and host laboratories virtually to ensure appropriate infrastructure and determine qualified personnel for the training. Upon arrival in country, the APHL consultants met with the laboratory director and personnel to provide an overview of the week. The consultants conducted a rigorous five-day training, including auditing lectures and assay setup and verification to ensure the assay can be performed optimally and reproduced in non-domestic settings. At the end of the training, the international laboratories were required to present their verification results,



APHL infectious disease team consultants provided hands-on technical assistance and training for the influenza and SARS-CoV-2 “Flu SC2” multiplex PCR assay in Manila, Philippines

The EUA FluSC2 Multiplex assay is currently available to US state and local public health laboratories through CDC’s International Reagent Resource (IRR). The RUO FluSC2 Multiplex assay is available through IRR for international public health partners participating in the World Health Organization (WHO) Global Influenza Surveillance and Response Systems (GISRS) and other CDC-sponsored initiatives associated with pan-respiratory disease surveillance during the 2022–2023 influenza seasons.

provide an overall conclusion and receive additional feedback. Across the four in-country trainings, APHL consultants successfully trained more than 30 laboratorians from six different countries (Egypt, Somalia, Iraq, Jordan, Oman and the Philippines). These trainings allow participating countries to meet the demand of influenza and SARS-CoV-2 testing and will ultimately enhance global surveillance abilities. APHL and CDC hope to continue assisting countries through targeted technical assistance trips as well as regional trainings as global travel resumes. ■

## References:

1. Shu, B, Kirby, MK, Davis, WG, Warnes, C, Liddell, J, Liu, J, et al. Multiplex Real-Time Reverse Transcription PCR for Influenza A Virus, Influenza B Virus, and Severe Acute Respiratory Syndrome Coronavirus 2. *Emerging Infectious Diseases*, 2021. 27(7), 1821–1830 (cited 2022 Sept 18). Available from <https://doi.org/10.3201/eid2707.210462>
2. US Centers for Disease Control and Prevention. *CDC’s Influenza SARS-CoV-2 Multiplex Assay and Required Supplies*. 2020 Feb 11 (cited 2022 Sept 18). Available from <https://www.cdc.gov/coronavirus/2019-ncov/lab/multiplex.html>
3. US Centers for Disease Control and Prevention. *Influenza Division International Program*. 2022 Jun 29. (cited 2022 Sept 18), from <https://www.cdc.gov/flu/international/program/index.htm>

# New Tool Available for Requesting Informatics Technical Assistance

By **Rachel Shepherd**, specialist, Informatics and **Brooke Beaulieu**, lead specialist, Informatics

Since 2008, APHL has delivered technical assistance (TA) to public health laboratories, public health agencies and their clinical partners to strengthen infrastructure, improve data management capabilities and expand data exchange capacity. Originally developed to help jurisdictions electronically transmit their influenza surveillance data to the **US Centers for Disease Control and Prevention** (CDC) in a standardized format, the TA program has evolved to support dozens of use cases and help jurisdictions fill gaps by providing support in project management, business analysis, terminology, technical architecture, system integration, database development and informatics training.

## Responding to a Changing Informatics Landscape

As TA expanded, so has the need for a streamlined and systematic process for receiving and prioritizing TA requests. Historically, requests were received in a variety of ways: some were sent to the Informatics Help Desk and ticketing system, others e-mailed to known contacts and colleagues, or requests were routed through and dictated by CDC, often through different divisions. However, as more requests came in over time, this ad-hoc process became unwieldy. And when **COVID-19** struck, public health laboratories and agencies faced not only an overwhelming volume of data, but also the demand to share it in near real-time. This required an immediate overhaul of the TA program to organize and accommodate this unprecedented need for support during a time when there was not a moment to spare, because any delay could postpone crucial public health action.

APHL's TA team immediately implemented changes in its internal processes to eliminate redundancy and

capitalize on economies of scale. Similar requests were lumped together to form cohorts across partners. In addition, requests had to be received in the same place so that the TA team could effectively triage, seeing the full breadth of needs instead of having a grasp of only a couple things at a time. In this way, TA could be deployed once instead of multiple times across public health.

## An Opportunity for Innovation

The Data Modernization Initiative (DMI) is a long-term, \$1 billion-plus effort to modernize core data and surveillance infrastructure across the federal and state public health landscape. By eliminating

**To date, APHL has provided technical assistance to every state public health laboratory and public health agency, as well as many local public health laboratories and clinical partners.**

silos in infrastructure, workforce and systems, and investing in comprehensive streamlined solutions, our nation will be more connected, more resilient and better equipped to prevent and respond to emergencies. As laboratories and agencies rethink and revamp their workflows, infrastructure and workforce under DMI, APHL is considering how TA can best support and meet their needs.

With lessons learned from the COVID-19 response and internal changes made to the TA process, APHL and CDC recently launched a new TA form to have one source that is visible to all. Laboratories and agencies in need of TA can now enter

their requests in one place and APHL can route appropriately (instead of the requestor determining who and how to ask). In this centralized location, all the right people are looking in one spot, which makes triaging, tracking, follow-up and coordination much more streamlined and efficient.

## Request Support

As public health laboratories and agencies identify existing and emerging needs for informatics support, they can submit a request using the new **APHL Technical Assistance Request Form**. APHL and CDC coordinate to provide TA for:

- Electronic laboratory reporting (ELR)
- Cross -jurisdictional data exchange (State-to-State InterPartner ELR)
- Case notifications and message mapping guides (NNDSS)
- Data Modernization Initiative (DMI)
- Electronic case reporting (eCR)
- Electronic test orders and results (ETOR).

The form also links to information about the available TA offerings so that requestors can readily identify their specific needs. Upon selecting the desired TA menu offering, the form expands to collect information to evaluate and triage the request. The more information requestors provide, the more the team will be able to hone its approach to meet the needs of the community. Finally, additional support requests will be added to the form so that this resource can truly be the one-stop shop for pursuing informatics TA.

For questions about the TA request form, contact [Brooke.Beaulieu@aphl.org](mailto:Brooke.Beaulieu@aphl.org) ■

# Workforce Resources for Public Health Informatics

By **Rachel Shepherd**, specialist, Informatics

The last several years have illuminated longtime workforce challenges in the field of public health: salaries uncompetitive with the private sector; frustrating bureaucratic delays and red tape; an impending loss of institutional knowledge as a huge swath of the workforce retires. There is also the fact that the entire system is built around the idea of longevity—people staying in roles for decades—which is inconsistent with today's workforce. However, the **COVID-19** response brought new challenges that are contributing to a major exodus of public health workers.

According to the 2021 Public Health Workforce Interests and Needs Survey conducted by the **de Beaumont Foundation** and the **Association of State and Territorial Health Officials** (ASTHO), 32 percent of state and local public health employees are considering leaving their posts within the next year. Nearly half of this group cite stress and burnout from the pandemic—unreasonable working hours and a lack of emotional, financial and public support.

With this exodus comes an urgency to grow, train and revitalize the current workforce. Opportunities like the **Career Pathways in Public Health Laboratory Science Program** fulfill an immediate need to develop future public health employees. Placing hundreds of fellows across a variety of disciplines throughout the nation's public health laboratories motivates a new deluge of workers to join and remain in public health, bolstering the field itself with renewed passion, interest and ideas. In addition to these sweeping changes, ongoing calculated and targeted efforts are critical to help develop and support those who remain in public health, the people we cannot afford to lose.



All of this is unfolding against the backdrop of the **US Centers for Disease Control and Prevention's Data Modernization Initiative (DMI)**, which emphasizes the need for new and innovative data sharing methods and cross-cutting strategies across laboratories to eliminate silos. The timing of DMI comes as laboratories are reflecting on the pandemic response and can truly take advantage of the opportunity to regroup; positioning their workforces, resources and infrastructure in ways that are logical, flexible and most effective.

Informatics needs—once commonly viewed as technical and separate from operations—are increasingly understood to be integral and connected to all the inner workings of a laboratory. APHL is working to advance informatics capacity and develop strategies to best support members as they embark on this DMI journey by convening the informatics community to collect, develop and disseminate resources, trainings and ideas.

## Public Health Interoperability Training Catalog

Volunteers across several public health organizations recognized the need for a single-source library of existing training resources instead of several stand-alone and disparate collections. They compiled and reviewed hundreds of resources and collectively curated the best into the **Public Health Interoperability Training Catalog**, a set of training and education resources, tools, presentations and publications on interoperability. The resources encompass a wide variety of topics including general interoperability and standards, public health informatics, governance, data quality and terminology.

## Introductory Informatics e-Courses

*Life of a Specimen* and *Life of a Result*:

These courses provide information on the role and processes of laboratory informatics by following a specimen and its affiliated data as they move throughout the laboratory and beyond. Topics include:

- Roles of various laboratory informatics personnel.
- Data relationships.
- Data quality and standards.
- Pre-analytic, analytic and post-analytic phases.

- Data and results storage.
- Data exchange (especially electronic).

#### *Introduction to the LIMS & Other Information Systems:*

This course provides an overview of the laboratory information management system (LIMS) and other information systems playing a key role in laboratory informatics. Learners explore LIMS functionality, the role of the LIMS in interoperability, various regulations and standards and the steps involved in LIMS implementation.

#### **Public Health Informatics Community**

This online gathering place on APHL's **CollABorate** platform is part of APHL's ongoing effort to help coordinate informatics strategies, needs, challenges and solutions across the public health landscape. Members can engage one another in discussions, pose questions, seek and provide guidance, explore resources, and learn of other engagement opportunities like events, trainings, workgroups, presentations and conferences.

#### **Interoperability Forum**

This quarterly convening of the public health laboratory informatics community features demonstrations and presentations from member laboratories on their solutions to common challenges. This opportunity for laboratories to share their successes and stories also provides space for participants to ask questions, connect and form relationships. Topics have included systems implemented to respond to the high volume of COVID-19 testing and web portals for ETOR and data exchange. Planning for a session on next-generation sequencing is currently underway. For more information or to get involved, e-mail [Rachel.Shepherd@aphl.org](mailto:Rachel.Shepherd@aphl.org). ■

## MEMBER EXCLUSIVE

## The Public Health Pricing List

The Public Health Pricing List is a *members-only* listing of discounts and special offers that APHL negotiates with corporate partners.

you can get **special pricing for instruments, service agreements, equipment, testing supplies, PPE and more**, from companies such as Bio-Rad, Luminex, Roche Diagnostics, QIAGEN, Promega, SCIEX and Waters.

### **Check out the savings !**

**Log in to [APHL.org](https://www.aphl.org) and visit MyAPHL**  
**[Your Resources](#) > [Member Resources](#) > [My APHL](#)**

This list is only available to the APHL member representatives and member associates that have been given membership rights under your lab's APHL membership.



For more information about the public health pricing list discount offerings, please contact Camille Walker, Manager, Corporate Relations, [camille.walker@aphl.org](mailto:camille.walker@aphl.org).

# 20 Years of Progress for Public Health Emergency Preparedness

By **Jill Sutton**, specialist, Emergency Preparedness and Response



Following 9/11 and the anthrax attacks of 2001, the **US Centers for Disease Control and Prevention** (CDC) Office of Public Health Preparedness and Response created the **Public Health Emergency Preparedness** (PHEP) program, an initiative focused on strengthening state, local, tribal and territorial readiness for public health emergencies.

This year marks the 20th anniversary of the PHEP program. Since its inception, PHEP has provided over \$15 billion in funding to state, local, tribal and territorial public health departments to improve their capacity to monitor and respond to a wide range of public health threats, such as emerging infectious diseases, natural disasters, or biological, chemical, nuclear and radiological events. In 2011, CDC developed 15 **capabilities** that serve as a framework for jurisdictions to guide their emergency preparedness and response planning. In 2018, the capabilities were

updated to incorporate the experiences and lessons learned since 2011.

Public health laboratories play a lead role in the detection and response to public health threats. Every year, they receive a portion of their jurisdiction's PHEP funding and invest much of this funding on workforce. This is critical because the ability of the public health system to prevent, respond to and recover from emerging public health threats depends on a sustained workforce. Without a highly trained and resilient public health laboratory workforce, our vigilance for pathogens of public health significance is compromised, thus putting the public's health at risk.

Public health laboratories invest PHEP workforce funding to:

- Sustain laboratory positions.
- Recruit and retain laboratory staff.

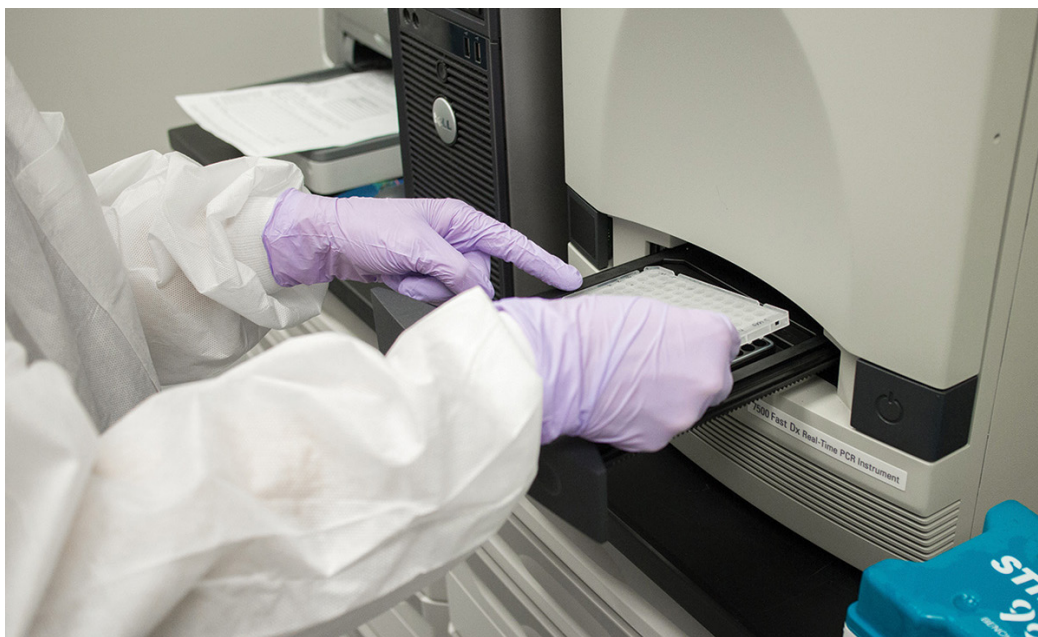
- Offer competitive salaries.
- Conduct trainings, exercises, drills, workshops, webinars and conferences.
- Engage in mentorship programs.

Two decades of funding, guidance and technical assistance from PHEP has helped public health departments build and strengthen their preparedness and response capabilities, however federal preparedness funding has declined over the last 20 years, making it even more challenging to meet the changing public health preparedness and response demands. This decline in funding has forced PHEP recipients to make cuts to their budgets for essential positions, preparedness trainings and exercises, and funding to offer competitive salaries, which impacts the viability of the public health workforce. Since public health laboratories are expected to maintain preparedness capabilities for all-hazards threats, dedicated and continuous federal preparedness funding is needed.

Public health preparedness has evolved in recent years, and it will continue to do so as we use lessons learned from past responses and face new public health threats. As we celebrate 20 years of PHEP, we honor all that it has helped public health departments accomplish and hope that, as public health changes, federal funding will adapt to ensure continued investments in public health preparedness. ■

# CDC Convenes Town Hall Meeting on Laboratory and Instrument Biosafety

By **Michael Marsico**, MS, manager, Biosafety and Biosecurity



**The town hall provided a forum for public health partners to discuss biosafety concerns around laboratory instrumentation.**

On June 24, the **US Centers for Disease Control and Prevention (CDC) Division of Laboratory Systems**, in collaboration with instrument manufacturers and public health and clinical laboratory partners, **convened a town hall** to discuss laboratory biosafety and the use of laboratory instruments. The goal was to provide an overview and discussion on laboratory biosafety when using laboratory instruments to test human and biologic specimens.

During the Ebola incidents in 2014, the laboratory community noted several concerns specifically around instrument safety that led to delays or lack of testing. Laboratory staff were concerned about their own safety regarding the perceived risks associated with Ebola virus testing. This and other gaps in biosafety was documented in *Clinical Laboratory Biosafety*

*Gaps: Lessons Learned from Poast Outbreaks Reveal a Path to a Safer Future.* This town hall was designed to work collaboratively across instrument manufacturers and public health and clinical laboratory partners to foster an understanding around the biosafety issues associated with laboratory instrumentation revealed during the Ebola outbreak, relate to both the **COVID-19** pandemic and the current monkeypox outbreak, and develop practical solutions to address these issues to improve public health pandemic preparedness.

Major topics discussed during the town hall included:

- Medical Device Design-Incorporating Safety and Biosafety
- Perceived Risks to Laboratory Personnel and Impact on Testing

- Independent Assessment of Risks and Instrument Design
- Panel Discussion on Potential Areas for Improvement

APHL Biosafety and Biosecurity Committee members Dr. Michael Pentella and Dr. Peter Iwen discussed their real-life experiences in laboratory testing of specimens from patients with Ebola virus disease and the perceived risks to laboratory personnel and impact on testing. Topics from the panel discussion around laboratory instrument improvement included:

- Increased communication with manufacturers to address issues around equipment instructions and manuals and suggestions to include more safety guidance in manufacturer instructions.
- Including clinical laboratory representatives during initial discussions around laboratory instrumentation with manufacturers to focus on potential safety concerns.
- Funding towards applied biosafety research.

The town hall provided a forum for public health partners to discuss biosafety concerns around laboratory instrumentation. Attendees were able to hear speakers present their topics and hear them discuss potential improvements around equipment safety with the goal to improve public health responses towards future emerging infectious disease threats. Continuing these conversations with clinical and public health partners to improve laboratory safety specifically around the use of laboratory instrumentation and testing is essential. ■

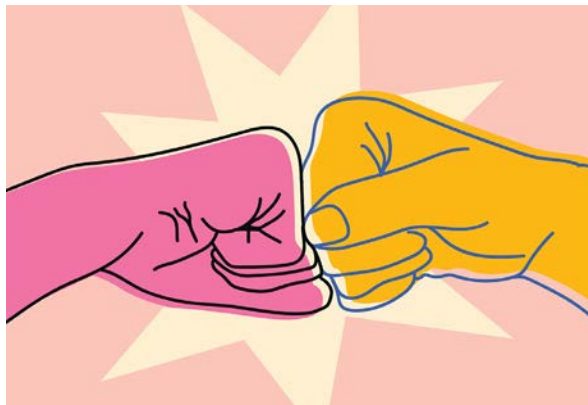
# Forging Collaborative Relationships Between Academic Partners and Public Health Labs

By **Dana Powell Baker**, MBA, MS, MLS(ASCP)CM, manager, Academic Partnerships

Global health champion and visionary Dr. Paul Farmer stated “with rare exceptions, all of your most important achievements on this planet will come from working with others—or, in a word, partnership.” Partnerships, or collaborative relationships, are essential to the equity plan for public health on a national and global scale. To promote and improve equity in public health, APHL recognizes the importance of addressing the needs of public health laboratory workforce development while providing access for emerging and future public health professionals to career pathways for public health laboratories.

As a part of the **Career Pathways in Public Health Laboratory Science** Project funded by the **American Rescue Plan**, a new APHL-CDC internship initiative has been established and fellowship offerings have been expanded to recruit and train the next generation for careers in public health. One of the crucial aspects of academic partnerships is to promote and support the recruitment and placement of APHL internship, fellowship and leadership program participants within the public health laboratory community. These efforts include forging collaborative relationships between laboratories and academic partners for fellowship and internship opportunities. Although academic partnerships are not entirely new to APHL or public health laboratories, a new position was created within the association to support the establishment and sustainment of partnerships with academic institutions.

In alignment with APHL’s core value related to diversity, equity, inclusion and accessibility (DEIA), the academic outreach strategy involves fostering and strengthening partnerships with Historically Black Colleges and Universities (HBCUs), Tribal Colleges and Universities (TCUs) and Hispanic-serving



institutions (HSIs), including organizations that prioritize and support the principles of DEIA. Diversity and inclusion are crucial for workforce development and the improvement of public health. In the strategy to strengthen and develop the public health workforce, the US Centers for Disease Control and Prevention’s **Division of Scientific Education and Professional Development** (DSEPD) addressed the need for increased diversity, equity and inclusion in public health. DSEPD noted the need to attract a more diverse and qualified public health workforce through better recruitment efforts. By enhancing recruitment efforts to be more inclusive and reflective of diverse backgrounds, there is an opportunity to expose public health careers to a broader community while striving towards a more inclusive public health workforce.

Although recruitment is a primary area of focus for academic partnerships, retention and public health laboratory workforce development is another vital area for expansion. Partnering with academic institutions and member laboratories to expand training opportunities creates options for those interested in building their skills. These opportunities are inclusive of pathways towards the pursuit of related certifications and advanced degrees. The University of South Florida, one of APHL’s longtime academic partners,

offers the **Doctorate in Public Health (DrPH) degree** in public health and clinical laboratory science and practice for public health laboratory professionals interested in leadership roles. This advanced degree option has provided a pathway for leadership positions at public health laboratories. Other key partnerships and collaborations are under development to provide more training opportunities and preparation for individuals in the public health laboratory workforce.

The promotion of career pathways in public health laboratories is evolving within the landscape of academic partnerships. Strategies include a multi-prong approach to promote pathways in public health through internships and fellowships. Furthermore, the implementation of advanced education and certification opportunities will support the ongoing professional development of those within the laboratory workforce. Other experiential learning programs, such as the **APHL Emerging Leader Program**, are also great options for current public health laboratorians to develop their leadership skills. Academic partnerships will continue to be essential to the establishment and maintenance of collaboration among those in the public health laboratory community, including academia, and other related organizations. ■

## References:

1. Farmer, P, Weigel, JL, & Clinton, B. To Repair the World: Paul Farmer Speaks to the Next Generation (Volume 29) (California Series in Public Anthropology) (First). University of California Press, 2019.
2. US Centers for Disease Control and Prevention. Public Health Workforce Development Strategies (2021 Sept 27) (cited September 2022). Available from <https://www.cdc.gov/csels/dsepd/workforce-strategies.html>.



# APHL-CDC Fellowship Program

An exceptional experience for fellows, mentors and laboratories

APHL-CDC fellowships provide experiential training to bachelor's, master's and doctoral-level scientists in preparation for impactful careers in public health laboratory science.

Historic funding has expanded this valuable fellowship program and even more opportunities are now available!

## Many Opportunities

Do you know anyone interested in starting an exciting new career in laboratory science, working collaboratively with industry leaders and developing professional networks?

APHL-CDC fellowships support a wide spectrum of laboratory programs, such as: genomics, infectious diseases, food safety, quality management, newborn screening, biorisk and biosafety, bioinformatics and informatics initiatives. Each fellow is trained in nine public health laboratory core competencies and works on unique program-specific projects.

- **Eligible Candidates:** Bachelor's, Master's and Doctoral-level scientists
- **Program Starts:** Flexible start dates
- **Program Length:** One to two years

## Host Labs Needed!

We encourage APHL member laboratories to apply to host fellows. The benefits of hosting include:

- Supporting ongoing laboratory services
- Supporting response to outbreaks and other investigations
- Contributing to projects that might otherwise be delayed or not initiated
- Providing supervisory and mentorship experience for host laboratory staff
- Introducing young scientists to public health laboratory science, allowing you to help shape a new generation of the workforce
- Providing a possible workforce pipeline for staff openings in your laboratory



**Learn more at [www.aphl.org/Career-Pathways](http://www.aphl.org/Career-Pathways)**



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## APHL Sustaining Member Program

The following corporations partner with APHL to support the nation's public health laboratory system.

### Diamond Partners



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