

2015 BPHL Annual Report



Bureau of Public Health Laboratories





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A Fond Farewell to Pensacola, Welcome Biosafety Outreach Program and Newborn Screening Turns 50!

Greetings! In 2015, the Bureau of Public Health Laboratories (BPHL) continued to “contribute to a healthier Florida by providing diagnostic screening, monitoring, reference, research and emergency public health laboratory services.” This report highlights several significant events from 2015 including:

BPHL Pensacola Laboratory closed its doors after more than 100 years of service

A Biosafety Outreach Program was established in the wake of the Ebola epidemic in West Africa, which highlighted the need for improved biosafety practices

Florida’s Newborn Screening Program, established in 1965 with testing of all newborns for phenylketonuria (PKU), celebrated 50 years

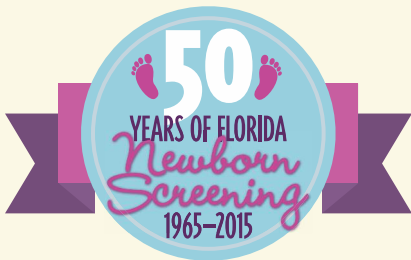
As you read the report you will learn about how the scope of testing performed by BPHL ranges from the testing of human samples related to outbreaks and communicable diseases, to the testing of animals for rabies and other viruses, to the testing of food related to outbreaks or biological and chemical threats, to the testing of samples from the environment.

We are grateful for the hard work of the BPHL staff who are committed to promoting and protecting the health of all Floridians and we look forward to the opportunity to continue to serve Florida’s citizens in 2016!



Carina Blackmore, DVM, PhD, Dipl ACVPM
Chief, Bureau of Public Health Laboratories

BPHL celebrates 50 years of Newborn Screening



Over the last five decades, newborn screening has become a well-defined, nationwide prevention program. Each year, more than 4 million newborns in the United States are screened for hearing loss and certain genetic, endocrine, and metabolic disorders.

Screening testing ensures early identification and treatment which saves lives and improves the quality of life for infants born with a disorder. In 2015, Florida celebrated the 50 year anniversary of its Newborn Screening Program. Since 1965, almost 7 million babies born in Florida have been screened by the BPHL in Jacksonville. Although newborn screening has improved and expanded over the years, challenges remain with laboratory testing and data collection. Many states are being asked to do more screening with fewer resources, providing a need for innovation in areas such as electronic ordering and reporting, test automation, multiplex and molecular testing, and quality assurance.

Florida began screening for phenylketonuria (PKU) in 1962. The screening was performed by hospitals and the state public health laboratory, BPHL. In 1978, the screening was expanded to include four disorders: PKU, maple syrup urine disease (MSUD), hypothyroidism, and galactosemia. All screening tests were consolidated in that year to be conducted only by the BPHL in Jacksonville. Since then, through technological improvements and partner collaboration, the list of disorders being screened continues to expand and Florida is now testing for 31 core conditions and 22 additional conditions listed on the Recommended Uniform Screening Panel (RUSP). By improving the efficiency, laboratory workflow, automation and use of modern technology, the Florida laboratory has been able to increase the number of disorders on the screening panel without additional personnel.

On September 24, 2015, the Department hosted a special event to highlight 50 years of newborn screening in Florida. Florida's First Lady Ann Scott joined the celebration of this major milestone. September is also recognized as National Newborn Screening Awareness Month. The event was held at the Florida Historic Capitol Museum. Also in attendance were several families with children who were able to receive treatment because of newborn screening. Dr. Ming Chan was recognized for his important role in Florida's Newborn Screening Program. He was Chief Chemist when the newborn screening laboratory implemented sickle cell testing in 1972. He attended the first ever Newborn Screening Council meeting in 1979 and served two terms on the council. He continues to be an important contributor to the Newborn Screening Program in his role as a laboratory consultant.



historical time line

The expansion of the newborn screening disorder panel:

1965 The Newborn Screening Program began in Florida with the passage of legislation that created Section 383.14, Florida Statutes. This required the Florida Board of Health to promote the testing of all newborns for phenylketonuria. At the time, 20% of testing was performed by hospitals and 80% was performed by the Department of Health, Bureau of Laboratories in Jacksonville and Miami.

1984 The program was expanded to identify infants at risk for hearing impairment and those with birth defects. Funds were appropriated to establish a confidential computer registry for birth defects.

January 1985 MSUD was deleted from testing due to the lack of any detected case in 500,000 births, but was added back to the Tandem Mass Spectrometry (MSMS) panel in January 2006.

April 1995 Testing for congenital adrenal hyperplasia was added to the panel.

October 1, 2000 Screening for hearing impairments was added back to the panel, as mandated by Section 383.145, Florida Statutes.

2002 The Newborn Screening Task Force was created with the passage of House Bill 817 to evaluate the newborn screening program and make recommendations for improvements to the program and consider any expansion, for example, to include disorders recommended by the March of Dimes and the American College of Medical Genetics.

July 1, 2004 The newborn screening fee was reduced to \$15 per live birth and the Department was given the authority to bill third party payers for newborn screening tests. The laboratory was given the authority to release the newborn screening results directly to the newborn's primary care physician or through the Department's Children's Medical Services.

October 1, 2005 Biotinidase deficiency was added to the panel (for a total of nine disorders).

January 9, 2006 Implementing tandem mass spectrometry added 25 new disorders to the panel including amino acid disorders, organic acid disorders, and fatty acid oxidation disorders (for a total of 34 disorders).

September 17, 2007 Cystic fibrosis was added to the screening panel, which meant Florida screened for a total of 35 disorders, which satisfied the recommendations by both the March of Dimes and the American College of Medical Genetics.

January 5, 2009 Physicians were able to register and obtain newborn screening results through the Florida Newborn Screening Results (FNSR) website. This online system allows access to newborn screening results for specimens submitted six months ago to present.

January 28, 2011 The Department's Genetics and Newborn Screening Advisory Council recommended adding severe combined immunodeficiency disease (SCID) to the panel. SCID testing was implemented in 2012.

January 20, 2012 The Genetics and Newborn Screening Advisory Council recommended working with the Cardiac Subcommittee of Children's Medical Services Advisory Council to implement critical congenital heart disease (CCHD) to the newborn screening panel. This was added to the panel in 2014.

February 19, 2016 The Genetics and Newborn Screening Advisory Council recommended adding Pompe disease to the panel. Validation testing is underway and this disorder will likely be added to the panel soon.



LEFT TO RIGHT Dr. Anna Likos, division chief; Dr. Ming Chan, former laboratory bureau chief and Newborn Screening director; Dr. Carina Blackmore, bureau chief; Dr. Bonnie Taffe, acting Newborn Screening director; Sherry Ray, data entry and customer service operations manager; Susanne Crowe, Jacksonville laboratory director.

1978 Congenital hypothyroidism, MSUD, and galactosemia were added to the panel. An Infant Screening Advisory Council (later renamed the Genetics and Newborn Screening Advisory Council) was established and regulations were set up with regard to follow-up, diagnosis and treatment of infants with abnormal results. In 1979/1980, the Bureau of Laboratories-Jacksonville was designated as the only site for testing all newborn screening specimens.

August 1988 Testing for hemoglobinopathies was added to the panel.

1993 Funding of newborn screening services changed from general revenue to fees collected from hospitals and birthing centers. A fee of \$20.00 per live birth charged to facilities with over 60 births and up to 3,000 births was established through Section 383.14, Florida Statutes.

March 1995 Identifying infants at risk for hearing impairments and birth defects was discontinued.

Collaboration between the Department and the University of Florida Enhances Capability to Investigate Invasive Meningococcal Disease Using Advanced Molecular Technology

Neisseria meningitidis is a Gram-negative bacterium that can cause meningitis. It is sometimes referred to by the name “meningococcus.” Often these bacteria lurk in the back of the nose or throat of an unsuspecting individual who has no signs or symptoms of disease. These people are “carriers.” However, sometimes these bacteria can invade the body and cause what is known as invasive meningococcal disease (IMD). There are several serogroups of *Neisseria meningitidis*, however five serogroups are responsible for the majority of disease and outbreaks of IMD. These serogroups are A, B, C, W and Y. Serogroups B, C and Y are the cause of most meningococcal illnesses seen in the United States while serogroup A is the most commonly seen serogroup in outbreaks in developing countries. In fact, in sub-Saharan African countries there is an area nicknamed “the meningitis belt” because of the predominance of IMD.

IMD is spread from person-to-person by exchange of respiratory and throat secretions or during close or lengthy contact such as between people living in the same household. IMD is more commonly seen in newborns, infants and adolescents. Symptoms of IMD include fever, headache and stiff neck and can be accompanied by nausea, vomiting, photophobia and altered mental status. IMD is a serious disease and can be fatal, sometimes within hours. In those who recover there can be long-term or permanent effects including hearing loss and brain damage. Early and rapid diagnosis, treatment, and prevention of IMD is crucial!

Outbreaks of IMD usually occur in the aforementioned at-risk age groups, particularly teens and young adults in close community settings such as schools, colleges, universities, and prisons. When there are multiple cases of the same serogroup over a short period of time it is considered an outbreak. Outbreaks of meningococcal disease are rare in the US and only about 2–3% of all cases are actually related to a known outbreak. However, because of the serious nature of the disease and need for quick action, early detection of outbreaks is extremely important.

Diagnosis

Cerebrospinal fluid (CSF) or blood samples are collected for laboratory testing. If *Neisseria meningitidis* bacteria are present they can be grown in culture and identified. Tests can also be done to determine the best antibiotic to use to treat that strain.

In addition to identifying the *Neisseria meningitidis*, the public health laboratory can perform tests to characterize the bacteria. This includes tests to determine the serogroup since this aids in deciding if the case is part of an outbreak and whether the serogroup is one that is covered by the vaccine. Pulsed-field gel electrophoresis (PFGE) may also be performed. PFGE is a fingerprinting method that can be used to compare the strain of the bacteria isolated from one case to others to figure out whether strains from different patients are related and likely to be from the same outbreak.

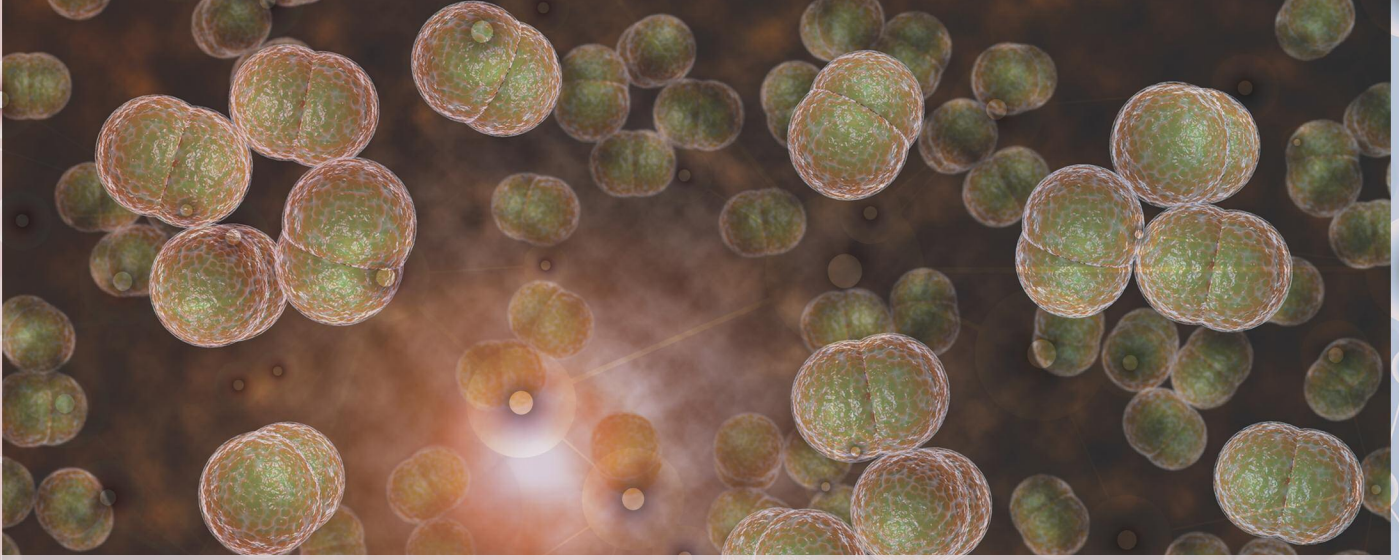
Treatment

There are several antibiotics that are effective at treating meningococcal disease. Early treatment is very important because it can greatly reduce the risk of death or serious long-term issues. Treatment also reduces the risk of the infected person transmitting disease to close contacts.

Prevention

Prophylaxis is the term used for treatment of persons who may have been exposed (i.e. through close contact to a person confirmed as having IMD) that can prevent them from getting the disease. Prophylaxis for IMD is treatment with appropriate antibiotics and in outbreak situations may also involve vaccinating a larger group of at-risk persons in order to halt further spread of disease.

Vaccination against IMD is recommended in the U.S. for all 11–12 year olds. This quadrivalent vaccine provides protection against serogroups A, C, W and Y. A booster dose is also recommended for older teens. In addition, 16–23 year olds may be vaccinated with serogroup B vaccines. If they are identified as being at increased risk, it is recommended.



In 2008–2009, the Department noticed an increase in the number of serogroup W cases in south Florida. Historically, Florida sees very few cases of IMD, and like the rest of the U.S. serogroups B, C and Y are most common.

It was noted that although the overall incidence of IMD in Florida had decreased from 1.1 to 0.28 cases per 100,000 between 1997 and 2009, in certain populations the incidence was 1.26 per 100,000 residents. This increase was found to be related to *Neisseria meningitidis* serogroup W135 cases in South Florida.

Neisseria meningitidis W135 has previously been associated with outbreaks among Hajj pilgrims in Saudi Arabia (2000–2001) and in Burkina Faso (2002) that led to 13,000 cases and 1,500 deaths. In the U.S., serogroup W135 has, on average, been responsible for less than 5% of the total cases, is not often seen in outbreaks, and has mostly been identified in patients who reported travel outside of the U.S. Therefore, this cluster of W135 serogroups was concerning to Department epidemiologists. Investigation by the Department identified 14 cases of W135 that were confirmed and serogrouped by the BPHL. BPHL also performed PFGE fingerprinting of the isolates which showed they all matched, indicating they were from the same strain. At the Centers for Disease Control and Prevention, additional fingerprinting methods were performed that confirmed the isolates were indeed closely related and were, in fact, similar

to the W135 strains isolated from the Hajj pilgrimage outbreak in 2000. Nevertheless, Department epidemiologists were unable to identify an epidemiological link between any of the Florida cases.

Through an exceptional collaboration between the Department and the University of Florida, Emerging Pathogens Institute (EPI), Dr. Marco Salemi's "Phylodynamic Laboratory" is able to utilize cutting-edge technology called Next Generation Sequencing (NGS) and population dynamic analysis (phylodynamics) to look in greater detail at the DNA of bacterial isolates. The emergence of *Neisseria meningitidis* W135 in Florida in recent years was identified as an ideal project for a collaborative investigation using this new technology. NGS was utilized to sequence the whole genomes of the Florida W135 isolates. NGS was also performed on several isolates from other sources for comparison to see if they could elucidate an epidemiological pattern or more information concerning transmission of W135 in south Florida. BPHL extracted the DNA from 68 *N. meningitidis* isolates retained from cases between 2009 and 2014 and shipped DNA to UF. The UF EPI performed NGS and phylodynamic analysis on the DNA.

The Department and UF analyzed the

results and concluded that the emergence of serogroup W135 in Florida has most likely been characterized by multiple introductions of W135 strains from North Africa, dating back to 2008. This was then followed by ongoing transmissions within separate transmission chains rather than a single transmission chain with a single point of entry of W135 into south Florida. Serogroup W135 is now the predominant strain seen in Florida, representing 60% of all IMD cases. Despite providing some important answers, this project yielded more questions about how transmission has occurred both to and from Florida, and the project is ongoing.

The Department continues to monitor disease trends and ensure appropriate diagnosis, prevention and treatment of disease. It is hoped that this new technology and ongoing collaboration will have significant implications for outbreak investigation and case management. NGS provides greater assistance in discerning potential epidemiological linkages than conventional methods. The emergence of *N. meningitidis* W135 in Florida offers a unique opportunity to explore the epidemiology of this pathogen as it expands into a new population.

The End of an Era



After more than 100 years of dedicated service to the people of Florida, the public health laboratory in Pensacola closed its doors on June 30, 2015.

The laboratory started as a request from the city of Pensacola to the State Board of Health in 1910 to provide services to the western portion of the state. As a result the laboratory opened in Pensacola's City Hall in June that year to provide clinical and environmental testing to physicians and county health departments. Testing performed by the laboratory's bacteriologist during the first year included examinations for tuberculosis, typhus, malaria, and hookworm. Notable accomplishments in recent years include the testing contributions during the anthrax response in 2002, Hurricane Ivan in 2004, Hurricane Katrina in 2005 and the H1N1 pandemic influenza outbreak in 2009. The sample volume handled by the laboratory decreased over time as a result of the shift from clinical to public health services in county health departments and consolidation of services within Florida's public health laboratory system. The growth in the network of commercial shipping services has made county health departments less dependent on having a public health laboratory within easy driving distance. Specimens from county health departments in Northwest Florida that were shipped overnight to the Pensacola laboratory are now shipped overnight to the laboratories in Jacksonville, Miami or Tampa with minimal impact on the overall test turnaround time. All the talented and hard-working staff who have been affiliated with the Pensacola laboratory over time are appreciated. Together, the Pensacola laboratory team made a difference.

I worked at the Pensacola Lab for over 10 years and even though we had a small staff, the Pensacola team's dedication and ability to take on any task, no matter how large, and get the work done in a timely and professional manner, was proven time and again.

—Patti Ryland



LEFT TO RIGHT Employees helping to close the doors include: Michael L. McLaughlin, Larry Revere, Thomas Dates, Jerry Donham, Patti Ryland, Leila Filson, Radley Remo and Glenn Reese.

The email arrived in the inbox of BPHL-Tampa laboratory director right at lunchtime on a Friday. The subject line was "Ricin Testing." The county health department epidemiologist and epidemiology laboratory liaison in Orange County had been notified about a person who had attempted suicide by ingesting castor beans. Castor beans contain the toxin ricin and they needed to know quickly whether the laboratory would be able to perform testing.



Ricinus communis is the scientific name for the castor bean plant. It is an ornamental tree that grows about ten feet tall with brilliant green, starfish shaped leaves and purple tinged stems. The plant originally comes from northeastern Africa and the Middle East but can be found all over Florida by the edges of roads and in fields and is considered an invasive species. The soft, spiny pods are abundant during the spring and summer and hold the seeds, or as they are often called, castor beans. The beans are the source of ricin which is very toxic when ingested. When ricin poisoning occurs, symptoms typically follow in less than 6 to 12 hours. These initial symptoms include nausea, vomiting and abdominal pain. However, there are many other chemical or infectious agents that can cause these symptoms and laboratory testing is essential in determining the correct diagnosis and treatment. Depending on the dose of toxin received and the route of exposure, serious health conditions or even death from ricin poisoning can take place within 36 to 72 hours of exposure.

Fortunately, BPHL is a part of the Laboratory Response Network Chemical (LRN-C) program and is equipped to test for ricinine, a metabolite of ricin, which can be detected in the urine of persons who have ingested the toxin. The Chemical Threat Preparedness Laboratory (CT Lab) in Jacksonville is a LRN-C Level 1 laboratory and is the only laboratory in Florida with the analytical method to identify ricin exposure in clinical samples. Ricinine is detected and measured by a liquid chromatography and mass spectrometry analytical technique. The amount of ricinine measured in the urine indicates the dose of ricin in the exposed patient.

The laboratory director contacted the CT Lab and the shipping instructions and sample collection forms were emailed to the local health department indicating how best to collect and ship the specimens. By 3:00 p.m. that afternoon the specimen was on its way to the laboratory by FedEx. The patient specimen was received at 10:30 a.m. the following morning and analysis began right away. Six hours later the results were available. The sample was positive and indicated that a very high dose of ricin had been consumed.

The attempted suicide was a 21-year-old male patient who had eaten a pizza with 16 castor beans in it. Unfortunately, suicide attempts by ricin ingestion are not as rare as you might think. Another case, a 49-year-old female patient in central Florida reportedly ate a single castor bean along with other pharmaceuticals. In both investigations, the BPHL CT Lab was able to perform analysis and return results within the same day of specimen receipt. It is good to know that the BPHL can do more than just the ordinary laboratory analysis and is ready to respond to all types of events.



toxic pizza

2015 BPHL



JANUARY

Technology Implicates the Turkey

The BPHL was able to use pulsed field gel electrophoresis (PFGE) technology to match a food items responsible for food contamination at a holiday party. Initial testing identified *Staphylococcus aureus* and *Bacillus cereus* toxins and cultures that were positive in several of the foods served including turkey, ham, and green beans. PFGE was performed on a clinical *S. aureus* isolate from one of the outbreak patients and it was identical to an isolate of *S. aureus* from the turkey.

FEBRUARY

Rapid Diagnosis of TB

The Mycobacteriology Laboratory detected ten tuberculosis (TB) positive patient specimens out of 102 tested in just one week in February. The specimens were tested for TB by real-time PCR. The real-time PCR method provides rapid detection of *Mycobacterium tuberculosis* with greater specificity than conventional cultures.

MARCH

Working with the Medical Examiner

The BPHL Microbiology Laboratory received cerebral-spinal fluid (CSF) from the Brevard County Medical Examiner collected from a pediatric patient who had expired. The laboratory was able to isolate *Neisseria meningitidis*. The CDC estimates that each year between 1,400–2,800 cases of meningococcal disease occur in the United States. The highest disease rate is seen in children less than one year old.

APRIL

Rabies Got Your Goat

In Sarasota County health officials euthanized a goat that was acting aggressively and was suspected of having rabies. A sample was sent to the BPHL laboratory for testing and the results were positive for rabies. A second goat from the same farm was submitted from Sarasota County about a week later and also tested positive for rabies. The veterinarian who treated the first goat's injuries stated that the goat was likely attacked by a rabid fox or raccoon.

MAY

Following the Rules

The BPHL facilitated the Infectious Substances Packaging and Shipping Training for over 300 staff and sentinel laboratory personnel including hospital, county health department laboratory, and non-sentinel laboratory partners statewide. This training is required every two years to maintain certification and compliance with federal regulations. Participants learned how to properly package and ship Category A and Category B infectious substances and other dangerous goods such as dry ice in accordance with prescribed guidelines. Funding for the training was provided through the CDC Cooperative Agreement Grant for Public Health Emergency Preparedness.

JUNE

Bite Worse than Bark

The BPHL Microbiology laboratory identified bacterial isolates from two different patients as *Capnocytophaga canimorsus*. Both patients had a reported history of a dog bite. Humans and animals have *Capnocytophaga* species as part of the normal oral flora, however, if a person is immunocompromised this bacteria can cause an infection and severe illness. There are numerous reported incidents where a minor bite has resulted in septicemia and coagulopathy which has led to the need to remove the affected area e.g. finger amputation.

Timeline



JULY

More Viruses on the Horizon

The Virology Laboratory completed the validation of its Zika virus real-time PCR assay and is now prepared to test for this new emerging virus. In May 2015, the public health authorities of Brazil confirmed transmission of Zika virus in the northeastern part of the country. Indigenous circulation of the Zika virus has been detected in the Central and South Americas since 2014. After experience with the recent dengue and chikungunya outbreaks, the BPHL stands prepared.

AUGUST

Exercise for Preparedness

The BPHL Biothreat Laboratory in partnership with BioWatch completed a full scale exercise coordinated by the Georgia 4th Civil Support Team and the Florida 48th Civil Support Team. The Biothreat Laboratory completed testing of the phase II swab samples and reported to the exercise team. The possibility of a bioterrorism event is still present and the state public health laboratory would play a pivotal role in identifying the organisms and working with other public health emergency responders. Participating in exercises are key to maintaining readiness.

SEPTEMBER

Mosquito Spray for Flipper

The Virology Laboratory performs testing on animals as well as humans! In September, the laboratory completed arbovirus testing on 24 dolphins that were submitted by the Georgia Aquarium as part of a study they were conducting. Two of the dolphins tested positive for Eastern Equine Encephalitis virus (EEEV) antibodies. Additionally, the Virology Laboratory tested a black rhinoceros from Busch Gardens Zoo in Tampa and it was positive for West Nile Virus (WNV) antibodies.

OCTOBER

Priority Testing

The laboratory tested a bat from Lake County that had been handled by school children. The bat tested positive for rabies and the result was reported within six hours of sample receipt at the lab. The parents of the students were directed to talk with the Florida Department of Health in Lake County regarding treatment and prevention of rabies infections. The Florida Department of Health in Pasco County also requested priority rabies testing of a dog submitted after biting an 18 month old on the face and lip. The head arrived at 3:40 p.m. and was reported out as negative by 6:30 p.m. These are both examples of swift and effective teamwork by the rabies testing staff and county health department staff.

NOVEMBER

Tick-Borne Disease

The laboratory identified *Babesia* sp. in specimens from a patient who went hiking in Wisconsin. The parasite is transmitted by the same species of tick that transmits Lyme disease and co-infections can occur. According to the CDC, babesiosis mainly occurs in parts of the Northeast and upper Midwest and the disease usually peaks during the warm months. Babesiosis infection can range in severity from asymptomatic to life-threatening depending upon the health condition of the infected individual.

DECEMBER

Mercury Exposure

The Chemical Threat Laboratory received specimens on a Saturday to test for exposure to mercury. The laboratory received two blood specimens from Hillsborough epidemiologists who were investigating the mercury exposure in a daycare center, associated with broken blood pressure equipment. Specimens were received at 11:00 a.m. and results were reported that day at 2:35 p.m. Both specimens were positive for mercury but were below the critical value of 10 microgram/liter.

Biosafety Outreach in Florida

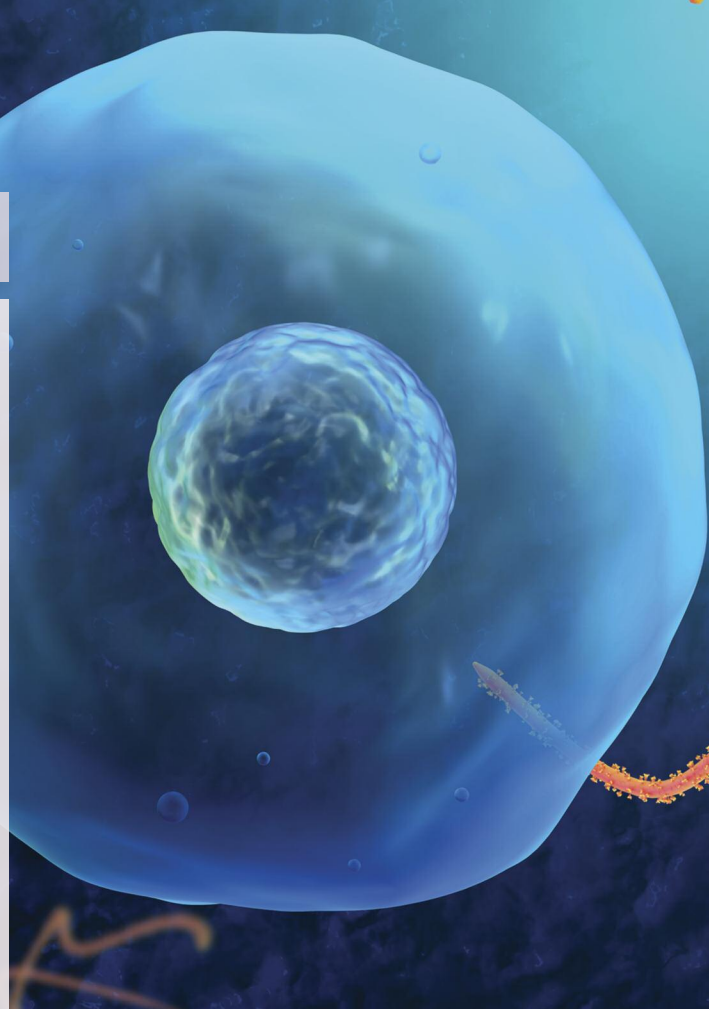
The Ebola outbreak in Africa in 2014 and the subsequent ripples that were felt in the United States highlighted how quickly an epidemic can spread throughout the world with global travel.

In the United States, we quickly realized that many clinical laboratories were unprepared to work with the virus. Laboratory workers felt they did not have the proper training or equipment required to safely process and test specimens from patients who may have been exposed to the Ebola virus. The fear of being unprepared and potentially at risk led to a delay in routine laboratory testing. In order for laboratories to perform testing to protect the community at large, it is critical that proper safety measures are in place in the laboratory to protect workers from the hazards posed by the testing methods used and agents that may be present. Collectively, these measures are referred to as biosafety.

The core of a strong biosafety program is risk assessment. In this process, the hazards in the laboratory are assessed and best mitigation measures are determined. Using this process, laboratories can understand and minimize risks that laboratory workers and the public at large might face from the testing of emerging infectious diseases including Ebola. To that end, Emilie Cooper and Ed Kopp were hired in the fall of 2015 as the new Biosafety Outreach Officers (BOOs) for the state of Florida. They are funded through a grant from the Centers for Disease Control and Prevention (CDC) that came as a response to the Ebola outbreak. The BOOs will train and consult on biosafety and risk assessment in public health and hospital laboratories across the state.

The idea is that each institution will be able to perform its own risk assessment with guidance from Emilie and Ed. It is important for the laboratories to learn how to perform these assessments themselves so they can update their procedures and practices when laboratory conditions change, or at least on an annual basis.

The BOOs will begin by providing training and risk assessment tools at the three BPHL locations in Jacksonville, Miami, and Tampa. Once that is completed, they will move on to the six advanced capacity hospital labs in the state. Finally, the BOOs will visit as many of the state's 117 sentinel hospital laboratories as possible over the next year. These visits will be for the benefit of the laboratory personnel and surrounding communities to increase safety and decrease risk. The visits will not be in an inspection capacity. The BOOs will simply serve in an advisory capacity to help make laboratories safer.



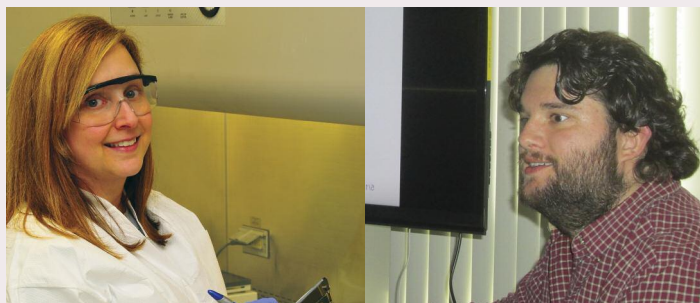
BOOs were busy in 2015

Receiving training in biosafety and risk assessment by taking courses provided by the Association of Public Health Laboratories (APHL), BPHL, CDC, and American Biological Safety Association (ABSA).

Reviewing existing literature and resources to gain an understanding of how to perform risk assessments.

Creating risk assessment tools that will eventually be used in BPHL and hospital laboratories to help them implement their own risk assessments.

Producing biosafety and risk assessment how-to presentations to teach the laboratories how to create a culture of safety and perform risk assessments.



Emilie Cooper and Ed Kopp, biosafety outreach officers at work.



2015—The Viruses Keep on Coming!

2014 was the year of emerging and re-emerging viruses in Florida! Beginning in May, we identified the second case of Middle Eastern Respiratory Syndrome Coronavirus (MERS-CoV) in the United States. This was followed by the first locally-acquired chikungunya case. Then soon after the national outbreak of Enterovirus D68 began, cases were identified in Florida. If that was not enough, Ebola was making headlines as an unprecedented outbreak raged in West Africa. The BPHL spent the latter half of 2014 ensuring Florida was prepared and ready to test samples from any Ebola-suspect patients while simultaneously assisting with biosafety outreach and education to our clinical and private laboratory partners.

When 2015 rolled around, the BPHL was ready for the virus trends from 2014 to continue. But we soon learned the year would be as unpredictable as the viruses themselves! Ebola virus testing continued in 2015, but due to the extensive surveillance and monitoring of travelers conducted by Department epidemiology staff, the laboratories only tested three suspect samples in total and all were negative. Enterovirus D68 test volumes decreased considerably and the virus seemed to disappear as quickly as it had appeared. Florida also saw a reduction in chikungunya virus cases in 2015 (we detected 70 cases but none of these were locally-acquired) compared to

2014 (475 total, 12 locally transmitted). MERS-CoV testing also continued during 2015, but fewer patients were tested and all cases were negative. Also in early 2015, the United States experienced a multi-state measles outbreak linked to a theme park in California. As a result, state public health laboratories including BPHL were on standby and ready to test for possible cases. The BPHL also assisted other public health laboratories with their testing.

At this point you might be thinking 2015 was a relatively calm year for viruses. But we can't forget about Florida's climate and the ever present mosquitoes! Mosquitoes are known for their ability to transmit viruses known as arboviruses. To help protect citizens and visitors, Florida has a

robust sentinel chicken surveillance program that serves to provide indicators of

arbovirus populations around the state. Sentinel chickens are flocks of chickens located in most counties throughout Florida. Every week, the blood from the chickens is tested to see if they have been exposed to arboviruses. The results from this surveillance testing provides the county health departments and mosquito control programs with information on where mosquitoes are biting and where they may be transmitting virus. This enables the state to take public health actions and provide targeted mosquito control to prevent spread of these viruses to the human population. During 2015, over 51,000 chicken samples were tested and of these 448 were West Nile virus positive, 9 were St. Louis encephalitis virus positive, 86 were Eastern equine

see [KEEP ON COMING](#) on page 12



Technician testing sera for an immune response to certain arboviruses.

encephalitis virus positive and 10 were Highlands J virus positive. Other arbovirus surveillance programs included mosquito pool testing of which 13 out of 151 pools tested in 2015 were positive for West Nile virus, and testing live wild and exotic animals such as birds and dolphins. In 2015, out of 66 exotic animals tested, 10 were Eastern equine encephalitis virus positive and 11 were West Nile virus positive. The BPHL also performs arbovirus testing on clinical human specimens. In 2015, the BPHL identified several arbovirus positive cases including Eastern equine encephalitis virus, West Nile virus and St. Louis encephalitis virus. There were also several imported cases of dengue virus in 2015, but no locally acquired cases. While locally acquired cases of dengue have been identified in Florida, notably in 2009 in Key West and 2013 in St. Martin County, a vast majority of the samples tested are from travelers to the Caribbean where the virus is endemic. During 2015, BPHL identified 87 positive cases of imported dengue fever.

In May 2015, the Pan American Health Organization issued an alert confirming local transmission of Zika virus infection in Brazil. This marked the first time Zika virus, transmitted by the *Aedes* species mosquito, was reported to be circulating in the Americas. A new arbovirus was on the horizon. To prepare for possible cases in Florida, the BPHL validated a PCR test to detect the Zika virus in clinical specimens in July 2015. As 2015 drew to a close, BPHL remained prepared for what they knew was likely to be another busy year. In public health, preparation is definitely the name of the game. We need to be ready for the next public health emergency—whatever it may be. STAY TUNED!

In May 2015, the Pan American Health Organization issued an alert confirming local transmission of Zika virus infection in Brazil. This marked the first time Zika virus, transmitted by the *Aedes* species mosquito, was reported to be circulating in the Americas.

Testing chicken blood for exposure to arboviruses.



TATTOO more than a tattoo

In April 2015, the laboratory received a call from a concerned clinician who had several patients with skin infections suspected to be caused by mycobacteria. Three patients had developed skin rashes after receiving tattoos and all of them had received their tattoo at the same tattoo parlor. Suspecting an outbreak linked to tattoos from this particular parlor, the clinician notified the Department and submitted the mycobacterial isolates from these skin infections to the BPHL for identification. In addition, the tattoo ink used for performing these tattoos was also submitted for culture and identification to determine the potential source of contamination and infection.

TATTOO
PARLOR
X

357
clients

246
interviewed

38
cases

BPHL received specimens from 13 clients, including isolates for identification and pathology specimens, which were referred to the Centers for Disease Control and Prevention (CDC), Infectious Disease Pathology Branch. The tattoo ink and other environmental specimens were sent to an FDA laboratory for further investigation. The BPHL mycobacteriology laboratory identified more than one species of mycobacteria from the isolates. Four isolates were identified as *Mycobacterium abscessus*, and one was identified as *Mycobacterium fortuitum*. Results from CDC were equally mixed as they confirmed *Mycobacterium abscessus-chelonae* in one sample, *M. abscessus* in another and “non-tuberculous *Mycobacterium* species” in another (by molecular and immunostaining methods). The FDA results were also interesting with them finding *M. abscessus* and *M. fortuitum* in the opened ink bottles from the tattoo parlor, *M. chelonae* in an unopened ink bottle and *M. abscessus*, *M. mucogenicum*, and *Mycobacterium phocaicum* in tap water from the parlor, used to dilute the ink before tattooing. Although there were several

species of mycobacteria identified from these samples rather than one single culprit, it did indicate that contamination from the tattoo procedure, either in the ink or the water used to dilute the ink, was causing these infections.

A large investigation was conducted by the Department. There were a total of 38 cases (7 confirmed cases, 1 probable case and 30 suspect cases) and many more clients from the tattoo parlor were interviewed.

Ultimately, it was determined by FDA that there was evidence of adulteration in the unopened bottles of ink, evidenced by isolation of mycobacterial organisms from unopened bottles. In cases such as this, FDA can take action to protect consumers by asking the manufacturer to voluntarily recall the lot(s) of ink that tested positive for contaminating organisms. In addition, FDA can investigate the manufacturer to determine if the manufacturing processes are safe. The Department followed up with the tattoo parlor and reviewed best practices with them to help prevent this from happening again in the future.

IT in a Laboratory Environment

The role of Information Technology (IT) in health care has evolved over the years.

This is especially true at the BPHL where the use of IT resources has changed significantly. In 1991, the laboratory had a simple database tool to locate paper laboratory records and that was it. Today, we have a robust system that includes instrument interfaces, where a laboratory instrument can automatically transfer test results to a computer for reporting, as well as electronic ordering and reporting of laboratory results to health care providers. This requires a considerable IT infrastructure, not just the physical computer hardware but also software and systems to make it all work.

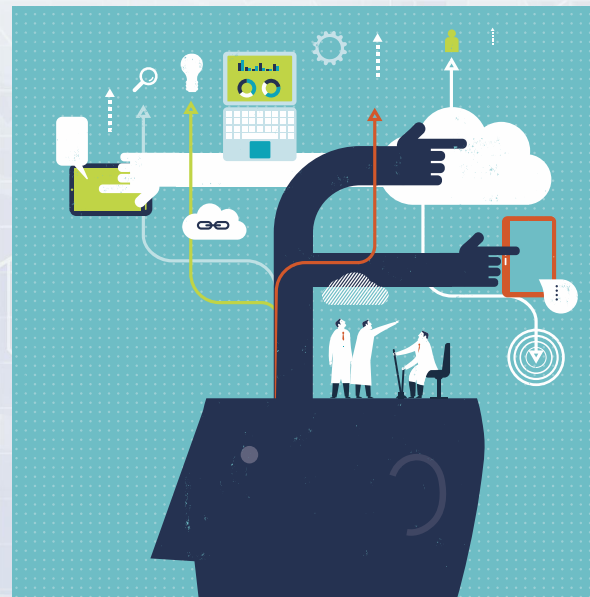
BPHL utilizes several different Laboratory Information Management Systems (LIMS) for the tracking, reporting and storage of test results: “LabWare” for environmental microbiology and all clinical testing, “Specimen Gate” for newborn screening and “Sample Manager” for environmental chemistry testing. All of these systems have to be maintained and updated regularly. In addition to how data are tracked, reported and stored at the laboratory, there are other systems that maintain health information on individual patients. These are Electronic Health Records. While an electronic health record may sound straightforward in theory, in practice it can be quite a challenge to achieve. This is due in large part to the fact that there are many different computer systems in use by different health care providers and they do not all ‘talk’ to each other. This is where Electronic Data Exchange comes in. Electronic data exchange is accomplished through the use of a standardized computer language. The BPHL currently sends electronic result messages for all

clinical tests reported through LabWare using “Health Level 7” (HL7) standard messages. These electronic result messages are sent through the Department Data Integration Broker and deposited into the Department Electronic Laboratory Reporting (ELR) database. From the ELR database, the results can be retrieved by other health care entities including county health departments, other programs within the Department e.g. Epidemiology, HIV and Sexually Transmitted Diseases programs and even to health care providers outside of the Department.

In 2015, the IT department worked on several projects to assist BPHL in advancing its electronic systems. One of these projects involved working with the Newborn Screening laboratory and the Department data integration team to set-up Electronic Ordering and Reporting (ELO/ELR) in this section of the laboratory—a long-term project that is ongoing. With ELO/ELR, programs and providers can have results within a few hours of when the laboratory

releases the results. Also, since results are reported using standardized result codes and messages that can be uploaded into the recipient’s database, it greatly reduces opportunity for human error and improves accuracy.

Keeping all of this straight would not be possible without the hard work of our BPHL IT staff. In addition, on a day-to-day basis the IT staff are fielding questions and issues from BPHL staff in Jacksonville, Miami and Tampa. In the age of technology, the laboratory and IT are intertwined and the laboratory cannot survive without our IT team!



Work Published in National Scientific Journals & Publications in 2015

"Nucleic acid testing by public health referral laboratories for public health laboratories using the U.S. HIV diagnostic testing algorithm." Wesolowski LG, Wroblewski K, Bennett SB, Parker MM, Hagan C, Ethridge SF, Rhodes J, Sullivan TJ, Ignacio-Hernando I, Werner B, Owen SM. *J Clin Virol.* April 2015. Volume 65, Pages 6–10.

"Limitations for the Use of HIV-1 Western Blot in Plasma/Serum." Association of Public Health Laboratories (APHL)/American Society for Microbiology (ASM) Fact Sheet released June 2015. Co-author Bennett B. http://www.aphl.org/AboutAPHL/publications/Documents/ID_HIV-1-1-WesternBlotBrief_62015.pdf.

"Lewisite exposure biomarkers in urine by liquid chromatography—inductively coupled plasma tandem mass spectrometry: with an accelerated matrix-matched stability study." Palcic, JD, Jones, JS, Flagg, EL, & Donovan, SF. *J. Anal. At. Spectrom.*, 2015, 30(8), 1799–1808.

National Meetings & Presentations

Forum on Laboratory Accreditation, February 2–5, Crystal City, VA

"The origins and history of the National Environmental Laboratory Accreditation Conference (NELAC): the 20th anniversary of NELAC," Steve Arms, moderator.

National Association of County and City Health Officials (NACCHO) 2015 Preparedness Summit, April 14–17, Atlanta, GA

"Full Circle Readiness: Protecting Global Health Security by Building Domestic Resilience," Phil Lee, co-presenter.

Association of Public Health Laboratories Annual Meeting, May 18–21, Indianapolis, IN

"Florida BPHL Statewide CLIA Training on Personnel Competency Assessment" poster presentation: Radley Remo,

Marie-Claire Rowlinson and Susanne Crowe.

"Update: Miami Public Health Laboratory as a Regional Confirmatory Test Site for the National HIV Behavioral Surveillance (NHBS) System" poster presentation: Leah Gillis, B. Luna and Berry Bennett.

"100 Year Celebration: A Model for Public Health Outreach" poster presentation: Aaron Monroy, Elesi Quaye, Joyce Kersaint, and Leah Gillis.

"Implementing Ebola Testing: Rollout at the Bureau of Public Health Laboratories in Miami" poster presentation: Aaron Monroy, Stephen White, and Leah Gillis.

"Development of Resources to Aid in the Implementation of Public Health Laboratory Competencies" poster presentation: Renee Ned-Sykes, Catherine Johnson, Leah Gillis, Eva Perlman, John Ridderhof.

"Biosafety Practices" and "Biosafety Auditing" oral presentations: Andrew Cannons, APHL Biosafety Workshop.

"Coaching Success in Lesotho" oral presentation: Andrew Cannons

Florida Society of Environmental Analysts, May 20–22, FL

"Oversight of Contracts for Laboratory Assessments" oral presentation: Steve Arms.

"Regulatory Forum: technical and certification-related aspects of Environmental Laboratories," Steve Arms, panel member.

American Society for Microbiology General Meeting, May 31–June 2, New Orleans, LA

"Adventures in our Own Backyard: It's a Small Bug's World" oral presentation: Marie-Claire Rowlinson.

"Routine Sequencing of the pncA Gene to Determine Resistance of Mycobacterium tuberculosis Complex to Pyrazinamide" poster presentation: Calin Chiribau, Younghee Lee, Charise Tanner, Patricia Miles, Susanne Crowe, Max Salfinger and Marie-Claire Rowlinson.

APHL National TB Meeting and National TB Controllers Association Conference, June 8–11, Atlanta, GA

Marie-Claire Rowlinson, APHL Laboratory meeting chair.

"It's Resistant, We Think: Challenges in Interpreting Drug

Susceptibility Results" oral presentation: Megan Ninneman, Beverly Metchock and Marie-Claire Rowlinson.

"Detection of resistance to first-line anti-tuberculosis drugs: Correlation between molecular and growth-based antimicrobial susceptibility testing methods", poster presentation: Calin Chiribau, Charise Tanner, T. Kuramoto, P. Miles, E. Burden, C. Anчета, K. Edwards, Y. Lee, S. Crowe, M. Salfinger and M-C. Rowlinson.

Florida Department of Health, Statewide Epidemiology Meeting, June 29–30, Orlando, FL

"Collaborating with Public Health Laboratories," Marie-Claire Rowlinson, Aaron Monroy and Lea Heberlein-Larson, presenters.

Environmental Measurement Symposium, July 13–16, Chicago, IL (The combined meetings of The NELAC Institute (TNI) and EPA's National Environmental Monitoring Conference).

"Writing Effective Non-conformances, Deficiencies and Findings for Internal Audits and External Assessments," Steve Arms, panel member.

"The Changing Face of Accreditation," Steve Arms, panel discussion.

"A NELAP Accreditation Body's First-Year Experience Using Contract Assessors: Lessons Learned in Florida" oral presentation: Steve Arms.

"Relevance of Measurement Traceability Standards to Environmental Testing Laboratories" oral presentation: Carl Kircher.

2015 Laboratory Response Network (LRN) National Meeting, September 9–11, Atlanta, GA

Andrew Cannons, meeting committee chair.

Southern California ASM (SCASM), October 15–17, La Jolla, CA

"Common Challenges and Practical Solutions for Plane Sailing in the Diagnostic Mycobacteriology Laboratory" oral presentation: Marie-Claire Rowlinson.

Southeastern National TB Center (SNTC) Clinical Course, October 20–21, Gainesville, FL

"Laboratory Diagnosis and Antimicrobial Susceptibility

Testing of Mycobacterium tuberculosis Complex" presentation and laboratory demonstration: Marie-Claire Rowlinson.

EPA Region 4 States Annual Laboratory Meeting, October 20–21

Attended by ELCP staff. Meeting provides technical and regulatory updates of interest to laboratory staff and certification officers as well as an opportunity to interact with EPA and state personnel on issues they have in common.

Florida Society of Environmental Analysts (FSEA) Fall Meeting October 28–30, Ft Lauderdale, FL

The FSEA's primary goal is to promote the exchange of knowledge, information and ideas relevant to environmental professionals.

"Florida Environmental Laboratory Certification: A Look at the Past, Present, and Future" oral presentation: Steve Arms and Vanessa Soto, panel members.

"Regulatory Forum: regulatory issues, laboratory certification requirements and technical guidance," Steve Arms and Vanessa Soto, panel members.

InFORM 2015: PulseNet, OutbreakNet and Environmental Health Conference, November 16–20, Phoenix, AZ

This integrated conference—Integrated Foodborne Outbreak Response and Management, InFORM—brings together laboratorians, epidemiologists and environmental health specialists involved with foodborne and enteric disease outbreak response.

"Implementation of a New Algorithm for the Identification, Isolation and Characterization of Shiga Toxin Producing Escherichia coli" poster presentation: Matthew Schimenti.

National Biomonitoring meeting, November 16–18, Richmond, CA

Victor Asirvatham attended the meeting which was held on California Department of Public Health (CDPH) campus hosted by CDC's Biomonitoring group and Biomonitoring California and with around 80 attendees from CDC and other State Public Health Laboratories.

2015 National HIV Prevention Conference (NHPC), December 6-9, Atlanta, GA

“The New HIV Diagnostic Algorithm: Impact on Timely Diagnosis, Linkage to Care and Surveillance in Florida’s Public Health Population” poster presentation: Berry Bennett, Bonnie Hardy, Sally Fordan, Leah Gillis and Susanne Crowe.



Steve Arms Honored at Florida Society of Environmental Analysts (FSEA) Meeting

At the close of the general session of the fall meeting of the FSEA, Steve Arms was awarded a lifetime membership in recognition of his many years of outstanding support. Presenting the award to Arms are Dave Murto, FSEA’s immediate past president (left) and Fred Bothe, president (right).

Boards & Committees

Association of Public Health Laboratories (APHL)

Informatics Committee: Susanne Crowe

Workforce Development Committee: Leah Gillis (2012–present)

Public Health Preparedness and Response Committee: Andrew Cannons (2007–present)

Knowledge Management Committee: Rick France (2014–2017)

Infectious Diseases Committee: Marie-Claire Rowlinson (2015–2017)

HIV/HCV Sub-Committee: Berry Bennett (2006–2016)

Arbovirus Sub-Committee: Valerie Mock and Lea Heberlein-Larson

Biosafety and Biosecurity Committee: Leah Gillis and Andrew Cannons

Network of Laboratory Leadership Alumni (NOLLA): Chair, Marie-Claire Rowlinson; members, Leah Gillis, Andrew Cannons and Mary Ritchie.

2015 LRN National Conference Planning Committee: Chair, Andrew Cannons.

American Society for Microbiology

Committee on Post-graduate Education Program: Board member, Marie-Claire Rowlinson.

FDA Partnership for Food Protection

Laboratory workgroup: Andy Cannons.

The NELAC Institute (TNI)

Board of Directors: Past Chair, Steve Arms.

Advocacy Committee: Chair, Steve Arms.

Nominating Committee: Chair, Steve Arms.

NELAP Accreditation Council: Steve Arms.

Non-Governmental Accreditation Body Working Group: Steve Arms.

Accreditation Body Expert Committee: Carl Kircher.

National Environmental Field Activities Program Executive Committee: Carl Kircher.

Laboratory Accreditation System Executive Committee: Carl Kircher.

Consensus Standards Development Executive Committee: Carl Kircher.

International Organization for Standardization

ANSI International Conformity Assessment Committee: Carl Kircher.

ISO CASCO Technical Interface Group: Carl Kircher.

Florida Public Health Association (FPHA)

Member At Large: FPHA Executive Board, Berry Bennett.

Board of Directors: First Vice President (Board Member/Co-chair Legislative Committee), Rick France.

Florida Consortium on HIV/AIDS Research (FCHAR):

Executive Advisory Board Member: Berry Bennett

Jacksonville Area Microbiology Society: President, Marie-Claire Rowlinson; Secretary, Beth Burden; and Treasurer, Matthew Schimenti.

Florida State College

Medical Laboratory/Histotechnology Program Board: Cheryl Healan.

Medical Laboratory Technician Advisory Committee: Berry Bennett.

University of South Florida (USF)

USF Institutional Biosafety Committee: David Wingfield, Marshall Cone and Andrew Cannons, chair.

University of North Florida:

Medical Laboratory Scientist Advisory Committee: Susanne Crowe and Berry Bennett

Awards

Association of Public Health Laboratories LRN Awards

Andrew Cannons received the 2015 APHL Emerging Leader Award.

Phil Amuso (BPHL-Tampa, retired) received the 2015 APHL Lifetime Achievement Award.

BPHL-Miami received honorable mention for their poster presented at the APHL National Conference.

Association of Public Health Laboratories Awards

Mary Ritchie received the Excellence in Public Service Award for contributions to the Florida Public Health Preparedness Program.

BPHL-Jacksonville received two awards at the Laboratory Response Network meeting in Atlanta, 9/9 to 9/11, one for assisting CDC with their proficiency testing program and another for assisting with e study for the Ebola assay.

Florida Public Health Association’s Homer Venters Award

Edgar Kopp, BPHL-Tampa.

Graduates

Master in Science and Biology: Rasheda Likely As part of her project included the publication of a paper, “Functional characterization of a putative disaccharide membrane transporter in crustacean intestine.” Likely R, Johnson E, Ahearn GA, J. Comp, Physiol B 2015 Feb;185(2):173–83.

Master in Computer Science: Keith Garrett

Master in Microbiology, USF: Carolyn Tales

Master in Public Health, Global Communicable Diseases, USF: Alyssa Moffitt, Dustin Rose, Sheila Aleghemand

Master in Public Health, Epidemiology and Global Communicable Diseases, and Certificate in Applied Biostatistics, USF: Shelby Leveridge

Grants

BPHL collaborations for the Retrovirology Department with CDC, APHL and private industry on several applied research projects, total awards: \$31,815.

Genius HIV-1/HIV-2 Supplemental Post-market Comparative Performance Study, BioRad Laboratories: \$ 4,495.

APHL HIV NAAT Demonstration Project , 2015 only: \$20,300.

CDC NHBS Project: \$ 7,020.

BPHL-Jacksonville was awarded the APHL/CDC grant to implement screening testing for TB for contact investigations of public health importance.

Expanded Access to Interferon Gamma Release Assay: \$42,162.

Thank You for Your Service

The BPHL is staffed by a team of highly qualified and dedicated individuals.

In 2015, staff were acknowledged for their long-standing service and retirements.

40 Years
Mary Cook, Miami

35 Years
Spencer "Berry" Bennett, Jacksonville

30 Years
Ron Baker, Jacksonville
Wayne Trasente, Jacksonville

25 Years
Aurora Grospe, Jacksonville
Sandra McConnell, Jacksonville
Stephen Prudencio, Jacksonville
Rhonda Shepard, Jacksonville

20 Years
Karen Chaires, Jacksonville
Leila Filson, Jacksonville
Dorcas Harper, Jacksonville
Clifford Knight, Jacksonville
Virginia Simmons, Jacksonville
David Wingfield, Tampa

Retirements

2014
Leila Akins, 34 years
Aida Garcia Perez, 42 years
Alida Simmons, 30 years

2015
Delonia Hicks, 28 years
Claretta Johnson, 24 years
Judy Byrd, 23 years
Judy Barber, 21 years
Berry Bennett, 37 years

