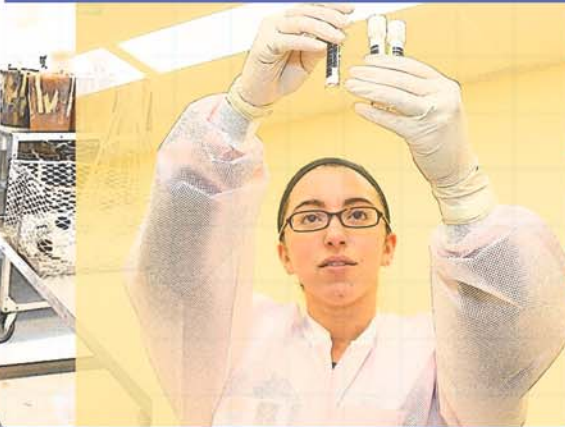


FLORIDA DEPARTMENT OF HEALTH

BUREAU OF PUBLIC HEALTH LABORATORIES

2013 ANNUAL REPORT





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About the Front Cover

CLOCKWISE FROM TOP LEFT: Jeremy Racicot works in the microbiology section; Dr. Marek Pawlowicz works in the molecular epidemiology section and performs Pulse-Field Gel Electrophoresis (PFGE) and “fingerprint” analysis; Dr. Paul Fiorella works in the molecular epidemiology section and performs PFGE and fingerprint analysis; Lylah Seaton and Justin Hubsmith, from the virology department, working in the biological safety cabinet; Jennifer Camacho in the serology department doing testing for STDs; and Thomasina Fields, who worked in laboratory support, unexpectedly passed away in October 2013—she had worked for the Department for 33 years, and was a part of our family and is greatly missed.

BPHL Acknowledges the Annual Report Committee

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Contributing to Florida's Health, LEAN(er) Laboratories & Healthier Employees!

Our Mission: To contribute to a healthier Florida by providing diagnostic screening, monitoring, reference, research and emergency public health services.

Greetings! We are very pleased to present the *Bureau of Public Health Laboratories 2013 Annual Report!* In 2013, 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” including:

- Performing newborn screening tests
- Performing testing for a local outbreak of Dengue Virus
- Performing testing on samples from food-borne outbreaks
- Performing testing of suspect biological threat samples at all four laboratories
- Performing rabies testing at all four laboratories

In 2013, the BPHL continued to work towards improving the quality and efficiency of services by utilizing LEAN principles and enrolling in the Molecular Assessment Program for Newborn Screening. The BPHL Environmental Laboratory Certification Program began contracting with vendors to perform environmental laboratory assessments. The BPHL supported the Department of Health's Healthiest Weight Florida Initiative by implementing a program that encourages employees to walk their way to better health and their healthiest weight.

We are grateful for the hard work and dedication 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 2014!

Susanne Crowe
Interim Chief, Bureau of Public Health Laboratories

HURRICANE SEASON

Ready or Not, Here it Comes!

It was an unimaginable event; two hurricanes were heading straight toward Florida the same week! Whether you blame it on global warming or a freak of nature, the reality was Florida's public health laboratories needed to be prepared!

The Department's BPHL is a network of four laboratories located in Jacksonville, Miami, Pensacola and Tampa. State government agencies in Florida, such as the Department, work hard to prepare for events that could impact their ability to provide services. In fact, emergency planning is so important that it is mandated by law. Chapter 252, Florida Statutes, mandates that all agencies have a plan in place to manage operations and provide mission essential services during disasters, emergency situations and other unforeseen circumstances. These plans are called Continuity of Operations Plans (COOP).

Most of you are probably familiar with the concept of emergency planning. The two main objectives of emergency planning are saving lives and saving property. The COOP planning goes beyond emergency planning and includes setting priorities, identifying essential functions and having a plan in place so that the organization can continue to accomplish the critical parts of its mission in any situation. The most critical services an organization provide are termed Mission Essential Functions (MEF). While all services provided by the BPHL are of public health importance, not all services are considered "urgent" or "critical."

QUICK FACT Mission Essential Functions (MEFs) are the most critical services that are provided by an organization. As part of the Continuity of Operations Plan (COOP) process it is important for organizations to know what their MEFs are. At the Bureau of Public Health Laboratories (BPHL) we consider the most urgent testing functions, such as rabies testing or testing for agents of bioterrorism as MEFs because this testing can have great public health implications and rapid, accurate testing is essential.

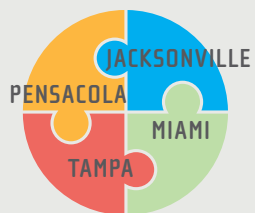
The MEFs performed by the BPHL include testing for rabies and biological threat agents.

An advantage of COOP planning is that it forces leadership and staff to think about the "what ifs." From the disastrous "what if our laboratory is devastated by a hurricane" to the more mundane "what if we cannot conduct testing because of a busted water main pipe." During an event, some employees might not be able to make it to the laboratory to perform their duties. Key leadership decisions will still need to be made and critical positions covered so that the laboratory can accomplish the MEFs. By design, the COOP also incorporates plans for Delegation of Authority and Orders of Succession. A COOP identifies who is in charge during an event and identifies staff that can perform testing during COOP emergencies. The COOP provides a roadmap for staff to follow during an event to ensure that critical public health laboratory services are provided to Florida's citizens without interruption.

WHAT IF A CATASTROPHIC EVENT DAMAGED A LABORATORY TO THE POINT IT WAS NOT OPERATIONAL? The geographical distribution of Florida's public health laboratories ensures continuity of testing services in situations when one of the laboratories is unable to conduct testing for any reason. These redundancies in testing capabilities are vital to the sustainability of critical public health testing during natural disasters and other emergencies.



CONTINUITY



12-HOUR MEF RESPONSE



MEFs



BIOTERRORISM AGENTS



RABIES



Dr. Andy Cannons and Dr. Rick France review the BPHL-Tampa COOP manual during the 2013 Statewide Hurricane Exercise.

Once your COOP is in place, you cannot be sure that the plan will work. A crucial step in the COOP process is testing the plan. The best way to test a COOP is with implementation. The two hurricanes converging on Florida described above—they weren't real but part of an exercise. All four of the BPHL laboratories participated with the Division of Emergency Preparedness and Community Support in this year's May 2013 Statewide Hurricane Exercise. This exercise provided the BPHL an opportunity to activate our COOP and identify strengths and areas that needed improvement. In the exercise scenario,

the hurricanes significantly damaged each of the laboratories as they passed through; first Tampa, then Pensacola, followed by Miami, and finally Jacksonville. As a strength, we identified that the BPHL laboratories are able to resume testing of MEFs they provide for public health safety within 12 hours after activation of the COOP. Our laboratory network was identified as another strength. An area for improvement was the lack of contingency plans in the event that key resources are not available for rabies and tuberculosis testing.

BPHL IS PREPARED With the 2013 Statewide Hurricane Exercise we found out that our COOP needed some minor revision; but, overall we were more than prepared. How about you? Are you ready?

Changes to the Environmental Chemistry Laboratory Department



IN 1986, THE FLORIDA LEGISLATURE ESTABLISHED THE INLAND PROTECTION TRUST FUND TO PROVIDE FUNDING FOR CLEANUP OF PETROLEUM-CONTAMINATED SITES. As part of this program, the Department's BPHL Environmental Chemistry Laboratory (ECL) performed testing of environmental samples for this and other cleanup programs. Since 2009 there have been legislative changes made to the trust fund and this in turn has meant a reduction in the scope of the testing required to support these programs and the designation of who will perform the laboratory testing.

On July 1st 2013, some of the testing that had previously been performed by the BPHL was transferred to the Florida Department of Environmental Protection laboratory including analytical and data collection for the following program sites: petroleum cleanup; dry-cleaning solvent cleanup; waste cleanup; and select non-petroleum or non-point source contaminated sites for the Water Supply Restoration. However, under the delegation of primacy from the Environmental Protection Agency (EPA), the BPHL continues to be the principal state laboratory for testing under the Safe Drinking Water Act. In 2013, the BPHL ECL tested almost 13,000 samples.

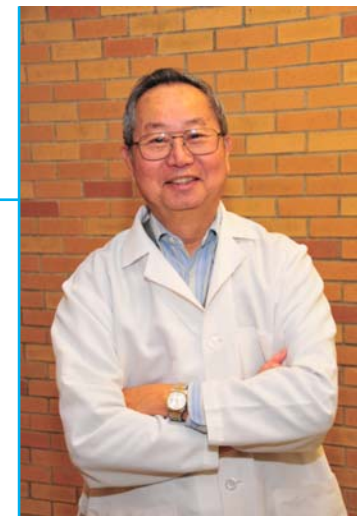
QUICK FACT The environmental chemistry lab sent out kits to homeowners in Hernando County to test for arsenic in urine of homeowners with drinking water wells potentially contaminated with the chemical. This project was funded by the Centers for Disease Control and Prevention. The BPHL worked with the Environmental Public Health Tracking Program in the Bureau of Epidemiology and DOH-Hernando, to collect and analyze 250 samples for arsenic.

NEWBORN SCREENING ENROLLS IN THE MOLECULAR ASSESSMENT PROGRAM (MAP)



IN JANUARY 2013, THE DEPARTMENT'S BPHL-JACKSONVILLE hosted a site visit from representatives from the Association of Public Health Laboratories (APHL) and the Centers for Disease Control and Prevention (CDC). This was part of an APHL/CDC-funded Molecular Assessment Program (MAP). The CDC's Newborn Screening and Molecular Biology Branch, in co-operation with APHL, conducts onsite visits designed to assess the molecular program of state newborn screening programs. The team supports quality improvement of current molecular testing capabilities and assists with the development and implementation of new molecular tests for newborn screening.

During the visit, APHL/CDC assessed the workflow and procedures for cystic fibrosis and severe combined immune deficiency (SCID) testing at the BPHL and provided recommendations for improvement and future activities.



Dr. Ming Chan, the retired bureau chief of BPHL, now consults for the Newborn Screening Program.

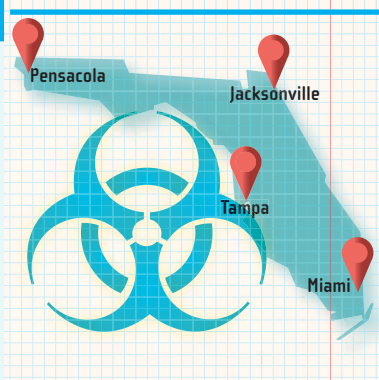
MAP also supported sending one of the newborn screening managers to the Michigan Department of Community Health, Newborn Screening Laboratory for training in deoxyribonucleic acid (DNA) testing for SCID in August 2013. Training covered preparing abnormal control samples and how to properly review assays. This collaboration and exchange of best practices is very beneficial for state public health laboratories.

QUICK FACT The Newborn Screening staff attended the APHL 2013 Joint Meeting of the Newborn Screening and Genetic Testing Symposium and the International Society for Neonatal Screening in Atlanta, Georgia on May 5th–10th, 2013. This meeting was in celebration of 50 years of newborn screening and was attended by more than 600 individuals from 37 countries.

BPHL: An Important Part of the Laboratory Response Network

The BPHL-Jacksonville Biological Defense Laboratory

In 2001, the Department's BPHL biological defense laboratory in Jacksonville was the first laboratory in the nation to positively identify *Bacillus anthracis* (the causative agent of anthrax) from a clinical sample during the post 9/11 bio-terror attack. The Laboratory Response Network (LRN) (an integrated network of local, state and international laboratories capable of quick response to biological threats and other high priority public health emergencies), had been formed only a few years earlier



laboratory's role may extend beyond sample analysis. For example in 2013, results for samples tested by BPHL-Jacksonville and testimony from laboratory personnel assisted federal prosecutors in convicting a Florida resident for

but BPHL was prepared. The laboratory's ability to identify bioterrorism agents was pivotal in aiding the response of local, state and federal authorities during this incident, which impacted the entire nation. Since that time, the BPHL has remained a highly active and effective member of the LRN. Occasionally, the

"threatened use of a weapon of mass destruction" after the individual mailed anthrax threat letters to multiple government agencies.

Pensacola BSL-3 Laboratory Re-Opens Also in 2013, the BPHL achieved its goal of re-opening the Bio-Safety Level-3 (BSL-3) laboratory in Pensacola. The BSL-3 laboratory is a high level containment facility where manipulation and testing of hazardous infectious agents can be done safely to ensure that laboratory personnel or members of the community are not exposed. Reestablishment of this laboratory permitted BPHL-Pensacola to reactivate membership in the LRN and resume its ability to respond to biological threats. As a LRN biological reference

laboratory the BPHL-Pensacola works closely with public health officials, law enforcement and the FBI Weapons of Mass Destruction Directorate and supports these agencies by testing suspicious substances for the presence of high priority pathogens such as *B. anthracis* and *Yersinia pestis* (the causative agent of the plague). Pensacola joins BPHL's other LRN biological reference labs located in Jacksonville, Miami and Tampa adding additional testing capacity, lending support for law enforcement cases, helping direct public health investigations and effectively providing medical and emergency first responders laboratory support within four hours.

HealthiestWeight

The vision of the Florida Department of Health is to be the Healthiest State in the Nation and in January 2013 the Department launched the Healthiest Weight Florida initiative. This collaborative effort between public and private entities brings together state and local agencies, businesses, non-profit organizations and communities all with the same goal of encouraging Florida's residents to lead healthy, active lives. It is estimated that in the year 2030 nearly 60 percent of Floridians will be obese, with the same proportion of children obese by the time they graduate from high school. The hope is that this initiative can bend the weight curve by five percent by the year 2017 and stem the obesity epidemic.

In spring 2013, through the Healthiest Weight Florida initiative, the Department's BPHL provided screenings of the HBO documentary *The Weight of the Nation* to employees. Watching the documentary, people really became aware of the magnitude of the problem and seeing the negative physical impact of carrying extra weight literally tipped the scales for many. They wanted to make a change and needed a program that would support them. Bonnie Hardy, HIV Incidence and Resistance Surveillance Laboratory Liaison, BPHL-Jacksonville, took on the challenge. She took the materials that had been distributed by Tallahassee and adapted them for the laboratory, thus developing a personalized weight loss program. Eleven people signed on to program, which meant modifying eating habits and incorporating exercise into the daily routine over a ten-week period. There were weekly weigh-ins and lots of cheering and recognition. Two memos were emailed every week to the participants, who were fondly called the Health Nuts, with helpful information and links to new websites that might support them in their endeavor.

At the end of the 10 weeks, a grand finale was organized to recognize the biggest loser and to congratulate the entire group. Overall the group lost three percent of their combined weight—a great accomplishment! Every person received a certificate in recognition of their participation and the person who lost the largest percent of their body weight won a pedometer, an American Heart Association Cook Book, and a \$50 Visa card.

HEALTHY LIVING BY DESIGN

in 2014, encourages healthy eating and exercise centered on completing 10,000 steps a day. The concept of 10,000 steps a day originated in Japan in the 1960s but is now a popular component of maintaining healthy weight and weight loss programs around the world. In addition to the BPHL, the challenge was promoted to other entities of the Department and includes participants from the Division of Emergency Preparedness and Community Support, Bureau of Vital Statistics and the DOH-Brevard County. The State Employees Credit Union (SECU) is also a participant. The challenge has each group compete with one another for the most total steps but ultimately the goal is to walk as a team. Walking as a team changes the way one walks. It provides support, direction and validation. Walking as a team builds new friendships and walking as a team is the best gift that you can give yourself.

If you are interested in taking part with the Department's BPHL, Division of Emergency Preparedness and Community Support, Bureau of Vital Statistics, the State Employees Credit Union and others contact Bonnie Hardy at bonnie.hardy@flhealth.gov or 904-885-2016.

THE 10,000 STEP CHALLENGE

Those who were involved in the first program wanted to continue and others at the laboratory who had heard about this endeavor wanted to get involved and were anxious to know what would be happening next. That's when Bonnie developed Healthy Living by Design: The 10,000 Step Challenge. This program, which started in 2013 and will continue





SALMONELLA

every year, more than



1,000,000 CASES OF INFECTION



**23,000 HOSPITALIZATIONS
450 DEATHS**



**\$365 MILLION
IN DIRECT
MEDICAL COSTS**



BPHL Enhances *Salmonella* Testing

The Centers for Disease Control and Prevention (CDC) reports that each year, approximately 1 in 6 people in the U.S. becomes sick from eating contaminated food. *Salmonella* is the leading cause, with estimates of more than a million cases of infection, 23,000 hospitalizations, 450 deaths and \$365 million in direct medical costs every year. Persons infected with *Salmonella* typically exhibit fever, diarrhea and abdominal cramps lasting 4–7 days. Fortunately, *Salmonella* infection is usually self-limited and generally does not require treatment. However, in certain populations (e.g., infants, elderly, immune-compromised or those with underlying health conditions) infection can be more severe resulting in hospitalization and sometimes death.

The *Salmonella* bacteria are found in the intestinal tract of humans and other animals including birds and reptiles. Transmission to humans is usually through eating food such as beef, poultry, milk or eggs that have been contaminated with animal feces containing *Salmonella*. However, any food item can be contaminated as exemplified by the 2013 *Salmonella* multi-state outbreaks that were linked to the following foods: tahini sesame paste, cucumbers, chicken and ground beef. Cooking food does kill the *Salmonella* but food can also be contaminated by an infected person (i.e., food handler) who has not washed their hands properly after using the restroom. In addition, *Salmonella* can cause infection through direct contact with an animal or pet. This is especially true of reptiles and chicks that are a particular risk for children who play with and touch them or their environment.

In the state of Florida there are at least 6,000 reported cases of salmonellosis every year with a peak in the summer/fall months. Figure 1 shows the number of cases of *Salmonella* reported to the Florida Department of Health by month for 2013, compared to the monthly average over the last 5

years. In September, Florida sees a peak of about 800 cases.

Salmonella is a reportable disease in the state of Florida which means that health care providers must report persons who are diagnosed with *Salmonella* (cases) to the Department. The Department is able to follow up with cases to determine a source for the illness. Health care institutions send *Salmonella* isolates from their patients (usually isolated from patient stool) to a public health laboratory for testing. The results can be helpful in determining transmission, source of outbreaks and ultimately preventing further cases.

The Department's BPHL performs laboratory testing of *Salmonella* bacterial isolates as part of the PulseNet program. As Kayleigh Jennings reported in the 2012 BPHL annual report, PulseNet is a national program, headquartered at the CDC in Atlanta, Georgia. The PulseNet program has been operational since 1996 to help detect and define foodborne outbreaks through laboratory testing. The PulseNet program relies on laboratories in each state to test isolates of *Salmonella* (and other foodborne bacteria such as *E. coli* and *Listeria*) to determine whether isolates



PHOTOS LEFT TO RIGHT: Medical Laboratory Scientist Matthew Schimenti, performs the molecular serotyping assay for determining *Salmonella* serotype. This new method has greatly improved our capacity to perform serotyping and in addition, we are able to determine the serotype in a timelier manner.



The microbiology department identifies certain enteric bacteria by growing them on tubes containing different media. Based on how the bacteria metabolize various biochemicals in the media, the media changes color. For example, *Salmonella Typhimurium* reduces sulfur in the media which produces hydrogen sulfide gas which reacts with iron in the media forming iron sulfide which appears black (second tube from left).

QUICK FACT *Salmonella* is a reportable disease in the state of Florida which means that health care providers must report persons who are diagnosed with *Salmonella* (cases) to the Department.

are related. There are many different types of *Salmonella* so isolates initially are “serotyped” to characterize the organism based on immunologic reactivity. Common serotypes in the U.S. are Typhimurium and Enteritidis. This information can be useful for epidemiological classification, outbreak investigations and sometimes the serotype correlates with disease presentation (e.g. *Salmonella* Typhi causes Typhoid fever). However, further analysis of isolates is usually needed to determine how closely related isolates are and whether they are likely to be from the same source. This additional analysis is performed by a method called Pulsed-Field Gel Electrophoresis (PFGE). The PFGE technique extracts deoxyribonucleic acid (DNA) from the isolated organism and cuts the DNA into pieces at certain locations. The small pieces of DNA are then separated on a gel based on size.

Looking at the pattern, or “fingerprint” of DNA pieces on the gel helps the laboratory scientist determine whether two isolates are potentially related to one another. The fingerprints are also uploaded to the PulseNet National Database for comparison with fingerprints of *Salmonella* isolates from patients tested in other states. Thus an isolate in Florida can be matched to an isolate in another state and this is how multi-state outbreaks can be identified, often before a common source for the infection has been

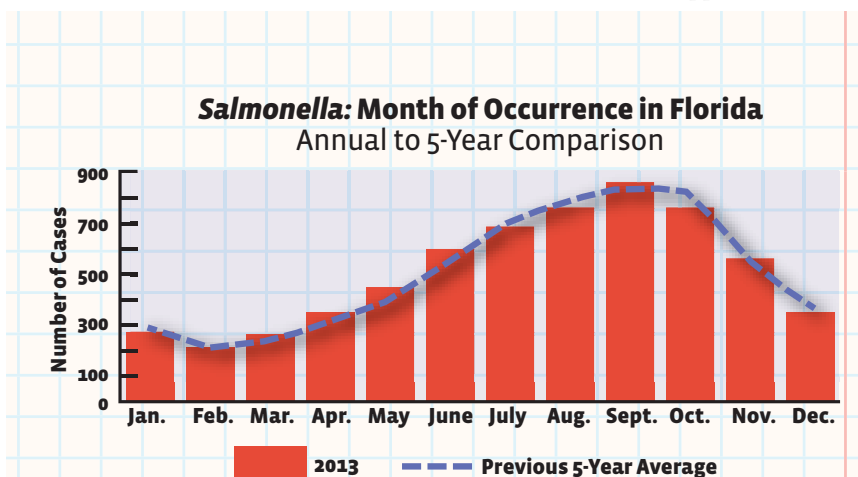
determined. For example, in 2013, there was an outbreak of Multidrug-Resistant *Salmonella* Heidelberg linked to chicken. This multistate outbreak affected 29 states with 634 cases. This outbreak was detected through PFGE analysis that identified a cluster of *Salmonella* isolates in California with a rare PFGE pattern.

Testing for *Salmonella* is very important for surveillance and prevention of disease but there are challenges associated with testing. In Florida, laboratories that identify *Salmonella* are not required by law to send *Salmonella* isolates to the state public health laboratory for further testing. Therefore, BPHL is not able to test an isolate from all of the approximately 6,000 cases seen in the state each year. Typically, BPHL receives about 1,500 isolates.

In 2013, BPHL worked on several approaches to

improve testing for *Salmonella*, starting with increasing the number of isolates that BPHL receives. BPHL-Tampa reached out to a local commercial laboratory and asked them to submit all of their isolates. The commercial laboratory started submitting isolates in April 2013 and submits up to 40 a week. Overall, BPHL is now receiving nearly 2,500 isolates on cases in Florida which is an increase of 1,000 isolates. This additional workload required hiring more staff, purchasing equipment and funding for supplies to support the increase in testing. Secondly, BPHL implemented a new test for performing serotyping of isolates. This new method involves molecular analysis and is a much more rapid test than the traditional serotyping method which was very labor intensive and required very specific reagents and technical skills. Because of the implementation of this new test, the BPHL is now able to serotype all of the isolates received. This testing provides more complete information to the epidemiologists who are investigating cases and will improve surveillance and prevention of disease.

Ultimately we would like to receive an isolate from every case in Florida. In addition, we will continue to improve and expand testing methods as new methods become available. In the near future we expect to see “next-generation sequencing” (another molecular method for analysis) coming to our laboratories.



2013

BPHL TIMELINE



JANUARY

New TB Test

The BPHL-Jacksonville TB laboratory implemented a new method for *Mycobacterium tuberculosis* complex drug susceptibility testing. Results from this method are reported as minimal inhibitory concentrations (MIC) for the drugs. Since this is a new format, the Florida TB physician's network is working to ensure the reports are understood by providers.



FEBRUARY

Smoothies Can Be Rough!

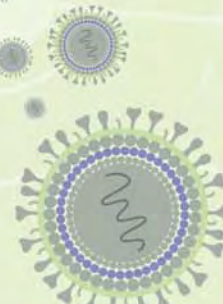
A food sample (fruit smoothie) was associated with a food-borne outbreak in Polk County. The BPHL-Tampa laboratory identified *Bacillus cereus* in the food using a rapid PCR test that was confirmed by culture.



MARCH

Is It Really Anthrax?

A specimen from a patient with a facial skin lesion suspicious of cutaneous anthrax was isolated as a beta-hemolytic *Bacillus* species. BPHL-Jacksonville BT laboratory used real-time PCR to determine the isolate contained *B. anthracis* DNA. However, conventional testing ruled out *B. anthracis* and the isolate was identified as *Bacillus cereus*. The CDC confirmed the isolate as *B. cereus* and did indeed harbor *B. anthracis* toxin genes. Previous reports have identified some *B. cereus* strains causing anthrax-like disease in patients.



APRIL

H1N1 Still Around

The BPHL-Miami laboratory received a specimen from Dade County Medical Examiner (ME) for pediatric death related to Influenza A (H1N1). BPHL received several ME specimens between March and April mostly for H1N1 testing.



MAY

Castor Beans Are Poisonous

The BPHL-Jacksonville chemical threat (CT) laboratory performed testing for ricinine on a patient who had ingested castor beans. A urine specimen on the patient was delivered from a hospital in Alachua County, by courier, the evening of May 3rd. The CT laboratory analyzed the specimen overnight and detected ricinine despite it being 6 days after ingestion. Ricin is a naturally occurring poison found in castor beans.



JUNE

Wedded Bliss?

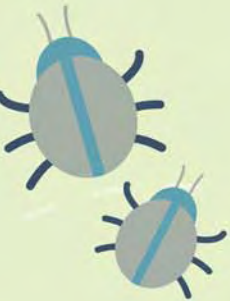
The BPHL-Jacksonville laboratory participated in a food investigation from Leon County. Thirty-eight of sixty-five wedding attendees (attack rate = 58%) had symptoms of food-borne illness. The laboratory isolated *Bacillus cereus* from the food sample (tacos) which were served at the wedding.

FLORIDA

Bureau of
Public Health Laboratories:

Pensacola
Jacksonville
Tampa
Miami

“Whether it’s a food borne illness, possible terrorism agent, tropical infection, tuberculosis or genetic disease—every day at the lab, there is an interesting public health investigation going on.” —Rick France, BPHL-Tampa, assistant laboratory director



JULY

Get Tick(ed) Off!

Ehrlichia chaffeensis was confirmed by the BPHL-Jacksonville laboratory in a Wakulla County resident with a history of a tick bite. Ehrlichiosis disease is caused when *Ehrlichia* bacteria are transmitted in the bite of an infected tick. Symptoms include fever, headaches, fatigue and muscle aches. Ehrlichiosis can be treated with antibiotics but preventing tick bites is the best measure against disease.



AUGUST

Fatal Vibrio

BPHL-Miami laboratory identified *Vibrio vulnificus* from a blood culture of a Monroe County patient who died. *Vibrio vulnificus* is a halophilic bacterium (found in saltwater) that causes infection when undercooked seafood is consumed or when open wounds are exposed to warm saltwater. *Vibrio* infections are more common in the warmer summer months in coastal areas of Florida.



SEPTEMBER

Not Always Plain Sailing

BPHL-Miami laboratory identified *Plasmodium falciparum* from a 27 year old patient who works on a cruise ship. Travel history provided did not explain the source of the infection since the islands traveled to on the cruise ship named do not have malaria.



OCTOBER

Food Borne Outbreak

As part of a food borne outbreak investigation the BPHL-Jacksonville laboratory shipped five *Escherichia coli* O157:H7 (shiga-toxin producing *E. coli*, STEC) isolates to the CDC for specialized subtyping testing (Multiple-Locus Variable-Number Tandem Repeat Analysis, MLVA). Having the MLVA fingerprint in addition to the PFGE fingerprint helps further differentiate strains and determine whether they are related to the same food source.



NOVEMBER

Nasty Worms

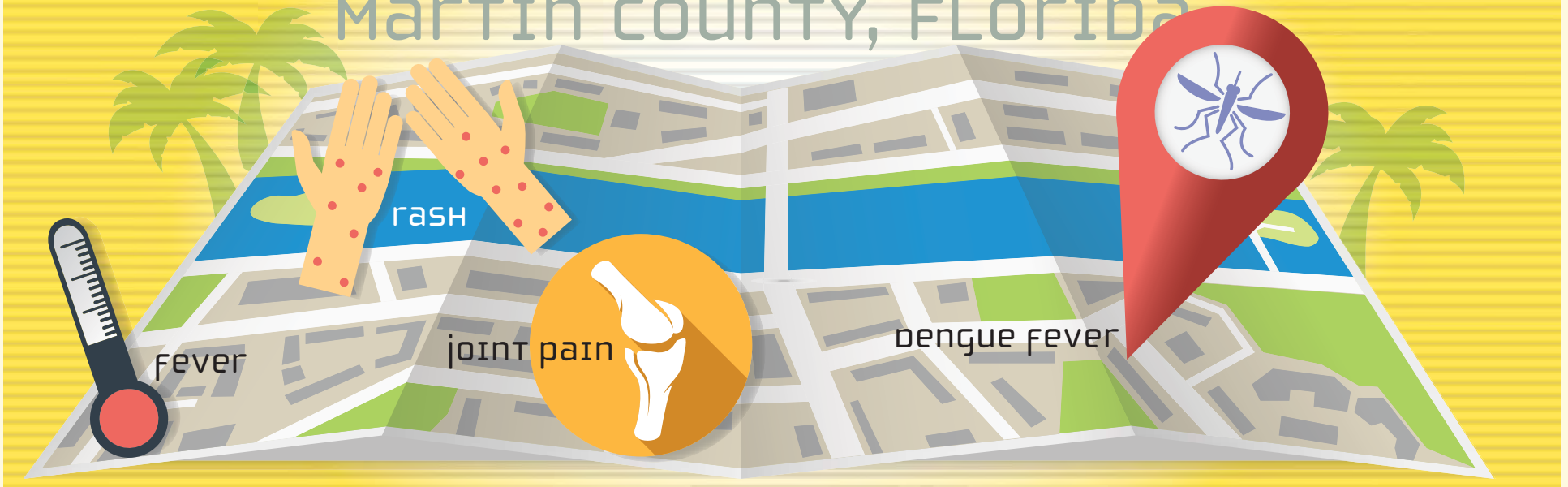
The BPHL-Miami laboratory identified a worm from a 9 year old patient as *Ascaris lumbricoides*. The CDC confirmed the diagnosis from images that were sent to their laboratory via specialized microscopes and computer software.



DECEMBER

SCID: Rare But Treatable!

BPHL-Jacksonville newborn screening (NBS) laboratory had an abnormal-screen positive case for severe combined immune deficiency (SCID). This was only the second presumptive SCID result that BPHL detected in the NBS laboratory since testing for SCID began in October 2012. This is out of over 200,000 babies born in the state of Florida each year that are tested through newborn screening. The SCID result was confirmed by testing at Duke University.



Dengue Outbreak in Florida

Fever. Rash. Joint pain.

These symptoms are common to many illnesses, but did you know they can also be symptoms of dengue fever? And did you know that dengue virus is endemic in many popular tourist destinations including the Caribbean?

According to the Centers for Disease Control and Prevention (CDC) more than one-third of the world's population lives in an area where there is risk of infection with dengue virus. Dengue is a leading cause of illness and death in the tropics and subtropics. As many as 400 million people are infected with dengue every year.

Dengue is caused by infection with any one of four dengue viruses (DENV). Dengue virus is transmitted by mosquitoes and, since there are no vaccines to prevent infection, avoiding bites from mosquitoes is the only effective protection measure. There is no cure for dengue virus but early detection of infection followed by prompt supportive treatment can lower the risk of medical complications and death.

At this point you may be thinking that as long as you avoid travelling to dengue

endemic areas, you do not need to worry about dengue. Not true! In 2009–2010, Florida experienced a local outbreak of DENV in Key West for the first time in more than 70 years. After that outbreak, the state continued to see sporadic cases of local transmission until another outbreak occurred in Martin County in 2013. In Martin County, 21 out of 139 patients with dengue symptoms tested positive for the presence of the DENV-1 virus and/or antibodies.

As a result of this high number of locally acquired dengue cases, a serosurvey was conducted to determine the extent of the outbreak. Serosurveys are effectively a test of the sera of a population to determine seroprevalence to, in this case, DENV. This serosurvey was conducted through a collaborative effort involving state and local epidemiologists and the BPHL. During a three week period, epidemiologists went door to door and a total of 396 individuals were interviewed and provided serum

QUICK FACT BPHL performed nearly 8,000 tests for mosquito transmitted viruses in 2013.



Lylah Seaton, lead arbovirology scientist, and Justin Hubsmith, biological scientist I, testing for the presence of DENV specific antibodies in a specimen.

samples for diagnostic serological testing. Specimens were forwarded to the BPHLs in Jacksonville and Tampa. Laboratory diagnosis of DENV included detection of viral RNA by a FDA-approved CDC-developed real-time reverse transcriptase polymerase chain reaction (RT-PCR) method, and detection of an immune response to the virus by measuring presence of DENV specific antibodies (IgM antibodies and IgG antibodies, which reflect the early and late immune response to the virus infection, respectively). All positive results were confirmed by Plaque Reduction Neutralization Test (PRNT), currently considered the “gold

While we cannot definitively say what ended the outbreak, contributing factors include increased mosquito-control efforts, as well as education provided to residents in the affected counties on how to protect themselves against dengue and other mosquito-borne diseases.

these were epidemiologically and genetically related to each other, as well as to a number of virus isolates from Venezuela. This analysis also showed that while this strain was the same serotype (DENV-1), it was definitely distinct from the 2009–2010 Key West virus.

The testing of these samples at BPHL provided conclusive linkage between outbreak-associated cases and clearly distinguished the Martin County outbreak from the Key West outbreak. The results of the extensive serosurvey conducted in Martin County also showed that approximately 2 percent of the participants surveyed were infected during the outbreak.

No more locally-acquired cases of dengue infection have been identified in Martin County since this survey was completed in September 2013. While we cannot definitively say what ended the outbreak, contributing factors include increased mosquito control efforts, as well as education provided to residents in the affected counties on how to protect themselves against dengue and other mosquito-borne diseases.

The success of this serosurvey was the result of tremendous collaboration between the bureaus of Epidemiology and Public Health Laboratories, the DOH-Martin County and the participation of residents in the affected areas.

standard” test for dengue. It is used to determine which of the four dengue viruses is causing the disease of interest.

Of the 396 survey participants, seven were positive for DENV-1 indicating a previous infection with dengue. Of these seven, three individuals were symptomatic. Further analysis using genetic sequencing of virus from the patients testing positive for DENV-1 and DENV-1 virus recovered from one of the infected serosurvey participants indicated

The BPHL Environmental Laboratory Certification Program (ELCP) employed a staff of assessors

to conduct environmental laboratory inspections for the approximately 350 drinking water and environmental testing laboratories in the state of Florida and provide their certifications. After September 2013, these Department-certified laboratories are required to, at their own expense, get inspected by one or more of the six companies contracted by BPHL ELCP to perform assessments that meet the requirements of the National Environmental Laboratory Accreditation Program (NELAP) and of the Department’s rules as specified in the contracts. Under these contracts the assessment providers are responsible for all aspects of each assessment, from scheduling to reporting to corrective action review.



Dr. Carl Kircher from the Environmental Laboratory Certification Program reviews work in the chemistry lab with chemist Eddie Howell.

The BPHL ELCP retains the responsibilities of application processing and proficiency testing review along with contract oversight and regulatory enforcement. We continue to make all certification decisions and related compliance determinations and remain firmly committed to our role as a NELAP-recognized accreditation body.

BRUCELLOSIS: Acquired from a Blood Transfusion



SO WHY IS BRUCELLA IMPORTANT? Brucellosis is a systemic zoonosis that can be acquired from contact with infected animals or animal products contaminated with bacteria of the *Brucella* genus. Brucellosis can manifest as an acute or chronic infection. Acute brucellosis presents as a nonspecific, flu-like illness, including symptoms of fever, sweats, headache, back pain, malaise, anorexia and myalgia. The chronic form of brucellosis can take more than a year to develop with symptoms that include chronic fatigue, recurrent fevers, depressive episodes, joint pain, orchitis and endocarditis. The most commonly reported species that cause illness in humans are *B. abortus*, *B. melitensis*, and *B. suis*. Humans appear to be more resistant to *Brucella canis*

infections, a *Brucella* species common in dogs. Although treatment is the same regardless of the infecting species, species-level identification can assist in directing the epidemiological investigation. *Brucella suis* infections, for example, are often related to contact with feral pigs. *Brucella* is considered a Select Agent by the Centers for Disease Control and Prevention (CDC). Identification of these four species should be performed by reference-level Laboratory Response Network (LRN) laboratories, which include state and local public health laboratories.

BRUCELLA CAN CAUSE INFECTION IN LABORATORY WORKERS An additional complication with *Brucella* is that if aerosolized it can cause infection in laboratory workers. Therefore, when handling *Brucella* specimens, laboratories should use appropriate personal protective equipment and

perform procedures in a biological safety cabinet. *Brucella* is one of the most common causes of laboratory-acquired infections in the U.S.

To determine the source of the likely contamination in the blood platelets, DOH-Broward initiated an epidemiological investigation. This investigation involved DOH-Miami-Dade, DOH-Palm Beach, the Department's Bureau of Epidemiology, the CDC, the blood bank, the commercial reference laboratory and the patient's hospital. The four contributing donors of the transfused blood product were identified by the blood bank and BPHL-Miami provided laboratory testing in an attempt to identify which of the four donors' blood was the source. Several tests were done including basic microbiological culture methods and molecular methods such as real-time polymerase chain reaction (PCR). Testing was performed on a range of specimens from the original red blood cell (RBC) units including the EDTA whole blood specimens collected for donor screening of infectious diseases to the blood culture bottles provided by the blood bank. With the exception of the initial growth isolated from the pooled platelet pack,

On April 26, 2013 a unit of pooled platelets was transfused into a 66 year old male from Miami-Dade County. Following standard protocol, a set of blood culture bottles were inoculated with the pooled blood product to ensure the platelets were free from contamination. On the morning of April 27, one of the blood culture bottles was positive for growth. The blood bank technologist isolated bacteria from the bottle and sent these to a commercial reference laboratory for identification. The reference laboratory performed testing to identify the bacterial isolate during the next few days and suspected the isolate to be *Brucella*. On April 30, the reference laboratory notified the Department's BPHL-Miami about the isolate and because the blood product had already been transfused, the blood bank arranged for immediate delivery of the isolate to the BPHL-Miami for testing. The BPHL-Miami quickly identified the isolate as a presumptive *Brucella* species by a rapid molecular method, and later that evening confirmed the species as *Brucella abortus*.



Stephen White, BPHL-Miami bioterrorism coordinator, reviewing test results.

all blood donor samples and specimens tested by culture and by real-time PCR were negative. In all, 107 specimens and extraction variations were tested. Nevertheless, one of the donors showed evidence of infection with *B. abortus* by serological testing. The serology result provided presumptive evidence that the donor had contributed the contaminated platelets in the platelet pack. Recently this donor had emigrated from Venezuela and had an extensive travel history through Central and South America before relocating to Florida.

INFECTED DONATED BLOOD PRODUCTS This appears to be the first case of *B. abortus* infection detected in donated blood products within the U.S. Donated blood and the resulting components collected in the U.S. undergo extensive and costly testing to ensure the safety of the receiving patient. Because the algorithm for testing blood and blood products is only established for specific infectious organisms and does not include *Brucella*, and since platelet products are prone to procedural contamination, this case demonstrates the critical importance of the sentinel laboratory-reference laboratory relationship for detecting agents like *Brucella*

in donor blood and its products. This relationship allowed for the rapid detection and confirmation of *B. abortus* contamination of a unit of pooled platelets transfused into a patient. As a result of these findings, the patient was provided *Brucella* post-exposure prophylaxis to prevent the development of brucellosis disease.

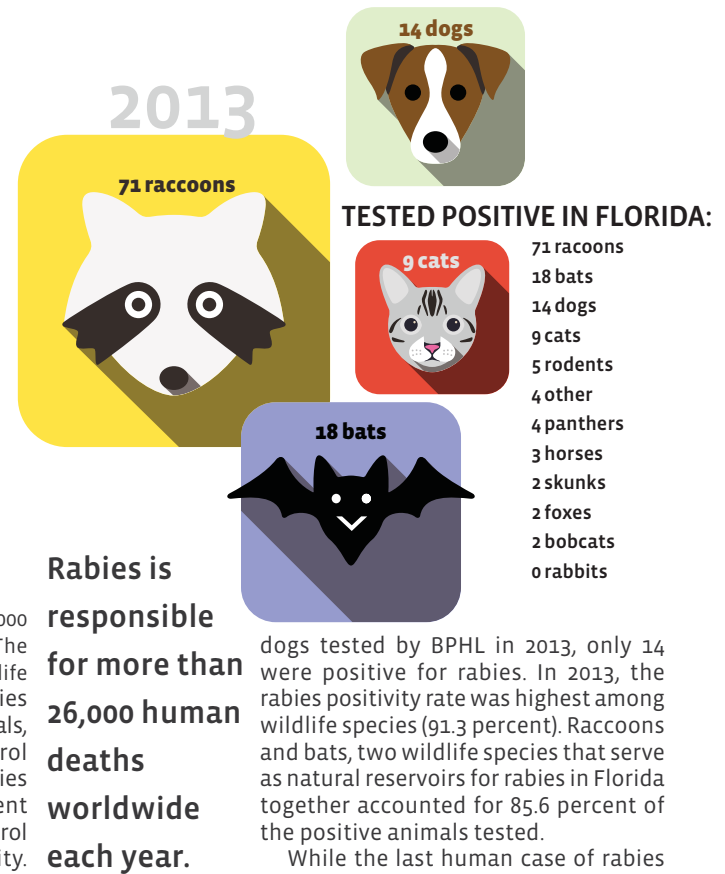
Florida typically ranks among the top five states in the U.S. for reported brucellosis cases. In 2013, there were nine cases of brucellosis reported to the Department including one non-Florida resident. Six of the cases were imported from Israel, Mexico (two), Saudi Arabia, Venezuela or Wisconsin and caused by *Brucella melitensis* (three), *B. abortus* or were confirmed by serology (two). The three remaining cases were caused by *B. suis*. Of these, two cases are thought to have been acquired in Florida from direct or indirect contact with feral swine and one possibly from dogs infected with *B. suis*. There were also 16 laboratory exposures associated with cultures from these cases.

RABIES— THE FACTS YOU NEED TO KNOW

RABIES IS AN INFECTIOUS VIRAL DISEASE THAT ATTACKS THE CENTRAL NERVOUS SYSTEMS OF WARM-BLOODED ANIMALS, INCLUDING HUMANS.

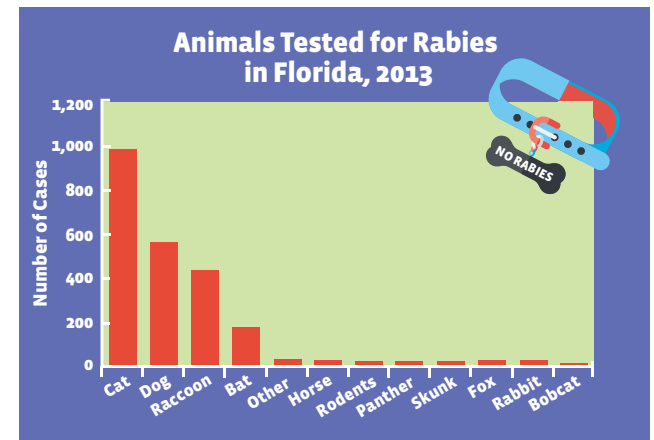
Rabies is responsible for more than 26,000 human deaths worldwide each year. The rabies virus is commonly found in wildlife populations throughout the U.S. Rabies infection occurs infrequently in domestic animals, including pets, primarily due to animal control and vaccination programs. Though human rabies cases are rare in the U.S., the almost 100 percent fatality rate of untreated infections makes control of this disease an ongoing public health priority. Rabies is most commonly spread through a bite or scratch from an infected animal. The lack of availability of an ante mortem rabies test for exposed individuals necessitates public health interventions including the animal testing performed at the BPHL. This animal testing can determine risk to the victim after they are exposed to a suspect or symptomatic animal.

During 2013, the BPHL tested 2,339 animals for rabies, 104 of which were rabies positive. As you can see in the figure adjacent, approximately two thirds of all animals tested were domestic species. Cats accounted for greater than 42 percent of all animals tested and 8.6 percent of all positives. Most of the cats tested were feral and can have close contact with wildlife vector species such as raccoons and bats as well, which makes them susceptible to contracting rabies and in turn, transmitting it to humans. Dogs represented 24 percent of animals tested for rabies and most were unvaccinated and/or strays. The BPHL typically tests a high number of dogs for rabies exposures since most human rabies are the result of dog bites. However, of the 574



dogs tested by BPHL in 2013, only 14 were positive for rabies. In 2013, the rabies positivity rate was highest among wildlife species (91.3 percent). Raccoons and bats, two wildlife species that serve as natural reservoirs for rabies in Florida together accounted for 85.6 percent of the positive animals tested.

While the last human case of rabies acquired in the State of Florida occurred in 1948, the number of animal cases detected in Florida emphasizes the need for the Department and other State agencies to remain vigilant with their ongoing efforts to ensure this deadly infection remains a rare occurrence.



The Speaker for Beaker

A Recognition & Rewards Program in Tampa

MOST EMPLOYEES APPRECIATE BEING RECOGNIZED. THEY PUT IN LONG HOURS AND CONTINUOUSLY GO THE EXTRA MILE FOR US. BUT HOW DO WE ACKNOWLEDGE THEM AND DO IT FAIRLY? At BPHL-Tampa we wanted to implement an easy, sustainable, and most of all, fun Recognition and Rewards program. To fulfill all of these requirements, we began a program that incorporates an unusual “token of appreciation” that goes by the name of Beaker.

Beaker is an actual Disney Muppet® character and is portrayed as the lab assistant for Dr. Bunsen Honeydew. Dr. Honeydew and Beaker are cohorts in slapstick skits where Beaker ends up on the wrong side of ill-fated experiments. The Beaker was perfect for our laboratory setting where our staff could sympathize with his misfortunes. We wanted to have a real “token of appreciation” for our Recognition and Rewards program so we purchased a Beaker Plush figure.

The Speaker for Beaker is a way for employees to recognize an outstanding coworker for contributing to the laboratory and lending a hand when needed.

SPEAKERS FOR BEAKER 2013

June: Angela Butler

July: Susan Hefti

August: Linda Raab

September: Marshall Cone

October: Italo Prada

November: Craig Bonner

December: Gail Scilabro



Angela Butler gladly accepts being recognized as the first Speaker for Beaker.

BASIC RULES FOR THE SPEAKER FOR BEAKER PROGRAM

The Speaker keeps Beaker for one month.

The Speaker is allowed to add one item of bling to Beaker.

The bling typically represents something specific about the Speaker's laboratory or department section.

The current Speaker selects the next Speaker based on at least one of the criteria of the Department's values.

A new Speaker has to come from a different department or lab section.

The new Speaker is announced at the next monthly staff meeting by the current Speaker or delegate.

You may only be the Speaker once a year.

As the Speaker you may pass on the knowledge the Beaker has bestowed upon you.

To understand the knowledge passing rule you need to know a little about Beaker's character. He knows basically two words—“meep” and “beep”—both of which he constantly utters as he is subjected to the whims of Dr. Honeydew.

Florida Health Values: ICARE

Innovation: Has creative solutions and manages resources wisely. *Brings in fresh ideas to get the job done.*

Collaboration: Uses teamwork to achieve common goals and solve problems. *Pulls people together.*

Accountability: Performs with integrity and respect. *Takes credit for successes and full responsibility for failures.*

Responsiveness: Achieves our mission by serving our customers and engaging our partners. *Goes the extra mile to keep people happy.*

Excellence: Promotes quality outcomes through learning and continuous performance improvement. *Shoots for the stars!*

Work Published in National Scientific Journals & Publications in 2013

Traynor, S., Kearney, G., Olson, D., Hilliard, A., Palcic, J., Pawlowicz, M. "Fish Consumption Patterns and Mercury Exposure Levels Among Women of Childbearing Age in Duval County, Florida" J. Environ. Health 2013, 75(6), 8–15.

Bennett B, Hardy B, Fordan S, Haddock-Morilla L, Rowlinson MC, Crowe S. "HIV single staging algorithm: Integration and maximization of resources by reducing time between HIV diagnosis and treatment." J Clin Virol. 2013 Dec;58 Suppl 1:e34–7

Bennett B, Neumann D, Fordan S, Villaraza R, Crowe S, Gillis L. "Performance of the new HIV-1/2 Diagnostic Algorithm in Florida's public health testing population: A review of the first five months of utilization." J Clin Virol. 2013 Dec;58 Suppl 1:e29–33.

HIV/Viral Hepatitis Subcommittee (significant contribution from Berry Bennett) "Testing for Hepatitis C Viral Infections: Frequently Asked Questions." Association of Public Health Laboratories (APHL)'s Publication. December 2013.

Carroll, R., Burda, W., Roberts, J., Peak, K., Cannons, A., Shaw, L. "Draft Genome Sequence of Strain CBD-635, a Methicillin-Resistant *Staphylococcus aureus* USA100 Isolate." 2013 Genome 1.

Grants Awarded

March 2013: Florida BPHL was awarded funds to support a *Neisseria gonorrhoeae* (GC) susceptibilities project with APHL/CDC. The project looked at inter-laboratory reproducibility of testing 200 GC isolates to antibiotics by the E-test susceptibility method. Florida BPHL was one of eight laboratories awarded funding for the project.

Association of Public Health Laboratories (APHL)

Informatics Committee:
Susanne Crowe

Public Health Preparedness and Response Committee:
Phil Lee, Andy Cannons

APHL/LRN Operational Workgroup: Phil Lee

HIV/HCV Steering Committee:
Berry Bennett

Workforce Development Committee: Leah Gillis, Andy Cannons

Network of Laboratory Leadership Alumni (NOLLA):
Chair Andy Cannons; members Leah Gillis, Marie-Claire Rowlinson

Core Competencies Committee:
Andy Cannons, Rick France, Leah Gillis

American Society for Microbiology

Committee on Post-graduate Educational Programs: Board Member Marie-Claire Rowlinson

FDA Partnership for Food Protection

Laboratory workgroup: Co-Chair Andy Cannons

The NELAC Institute (TNI)

Board of Directors: Past Chair Steve Arms

TNI Advocacy Committee: Chair Steve Arms

TNI Nominating Committee: Chair Steve Arms

TNI NELAP Accreditation Council: Steve Arms

TNI Non-Governmental Accreditation Body Working Group: Steve Arms

TNI National Environmental Filed Activities Program Executive Committee: Carl Kircher

TNI Laboratory Accreditation System Executive Committee: Carl Kircher

TNI Accreditation Body Expert 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: Executive Board Member Berry Bennett

Boards & Committees

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

Florida Consortium on HIVB/AIDS Research (FCHAR)

Executive Advisor: Board Member Berry Bennett

Jacksonville Area Microbiology Society

President Berry Bennett; Vice-President Marie-Claire Rowlinson; Secretary Beth Burden; Treasurer Matthew Schimenti

Florida State College

Medical Laboratory/Histotechnology Program: Board Member Cheryl Healan

Medical Laboratory Technician Advisory Committee: Berry Bennett

University of South Florida (USF)

USF Institutional Biosafety Committee: David Wingfield, Andy Cannons

Florida Department of Health

Leadership Institute: Rick France, Elesi Quaye

National Meetings & Presentations

Mass Spectrometry Applications to the Clinical Laboratory (MSACL), February 10–14, 2013, San Diego, CA:

“Analysis of Lewisite Metabolites in Urine by Solid Phase Extraction—Positive Electrospray Ionization—Liquid Chromatography—Tandem Mass Spectrometry.” Poster presentation, Jason Palcic.

Public Health Preparedness Summit, March 2013, Atlanta, GA:

“Preparedness and Politics in Public Health.” Presentation, Andrew Cannons.

APHL 2013 Joint Meeting of the Newborn Screening and Genetic Testing Symposium and the International Society for Neonatal Screening in Atlanta, GA May 5–10:

“Improving Efficiency and Workflow in Florida NBS Laboratory.” Poster presentation, Bonifacio Dy, Jasmin Torres.

American Society for Microbiology 2013 General Meeting, May 18–23, Denver, CO:

“Reflex testing of *Mycobacterium tuberculosis* complex (MTBC) NAAT-positive specimens for detection of drug resistance to rifampin and isoniazid by a rapid line probe assay.” Poster presentation, Marie-Claire Rowlinson.

“Rapid detection and isolation of *E. coli* O157:H7 from artificially contaminated ground beef and bean sprouts.” Poster presentation, Tatavarthy A, P. Davenport, V. Goff, K. Nguyen, A Tapawan, A. Cannons, D. Mccluskey.

Florida Society of Environmental Analysts, May 22–24, Florida:

“Detection and Quantitation or How to Make Something out of Nothing.” Poster presentation, ELCP Staff.

“The Future of Laboratory Certification in Florida.” Poster presentation, ELCP Staff.

APHL Annual Meeting, June 2–5, Raleigh, NC:

“Development of the Miami Public Health Laboratory as a Regional

Confirmatory Test Site for the National HIV Behavioral Surveillance (NHBS) System” Poster presentation, Leah D. Gillis.

“Connecting Labs in the Digital Age.” (as part of the panel Signals & Trends: What Will Public Health Look Like in 10 Years?). Presentation, Phil Lee.

“Integration of Diagnostic and HIV Clinical Management Testing to Maximize Resources.” Poster presentation, Bonnie Hardy.

Environmental Monitoring Conference (NEMC) and The NELAC Institute (TNI), in San Antonio, TX:

“TNI Laboratory Accreditation Body.” Session chair, Carl Kircher.

“Chemistry Fields of Proficiency Testing (PT) Subcommittee.” Session chair, Carl Kircher.

“The Importance of Competence in the Environmental Measurement and Monitoring Community.” Session chair, Steve Arms.

8th National Conference on Laboratory Aspects of Tuberculosis, August 18–21, San Diego, CA:

“MICs in Tuberculosis Susceptibility Testing: Challenges and Solutions for Implementation.” Presentation, Marie-Claire Rowlinson.

“Evaluation of the BD MAX™ instrument for automation of a laboratory developed test for detection of *Mycobacterium tuberculosis* complex (MTBC) directly from the specimen.” Poster presentation, Marie-Claire Rowlinson.

“Retrospective Analysis of Testing Algorithm Using Molecular Detection Methods for Early Identification and Treatment of Multi-Drug Resistant Tuberculosis (MDR-TB) Cases”. Poster presentation, Travis Jobe.

American Society for Clinical Pathology (ASCP) 1-hour webinar, October 15:

“New Tools for the Diagnosis and Antimicrobial Susceptibility Testing of *Mycobacterium tuberculosis* Complex.”

Webinar, Marie-Claire Rowlinson.

Fall Meeting of the Florida Society of Environmental Analysts, October 23–25, Palm Beach, FL:

“3rd Party Assessors—Key Elements of the Program—What Laboratories Need to Know.” Panel, Steve Arms.

“Meet the New FDOH Private Party Assessors.” Panel, Steve Arms.

APHL/CDC InFORM (Integrated Foodborne Outbreak Response and Management), November 18–21, San Antonio, TX:

“Evaluation of a Molecular Serotyping Assay for *Salmonella*: A Florida Perspective.” Poster presentation, Matthew Schimenti.

Jacksonville Area Microbiology Society (JAM) meeting, December 3, Jacksonville, FL:

“Case Study: An Old Bug With A New Trick? You Cannot Be Serious!” Presentation, Phil Lee.

BPHL is staffed by a team of highly qualified and dedicated individuals. In 2013, many staff were acknowledged for their service.

THANK YOU FOR YOUR SERVICE

40 YEARS

Mary Cook, Miami

35 YEARS

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

Dee Harper, Jacksonville

Clifford Knight, Jacksonville

Virginia Simmons, Jacksonville

David Wingfield, Tampa

15 YEARS

Neomi Abella-Sanchez, Jacksonville

Keith Garrett, Jacksonville

Lea Heberlein-Larson, Tampa

William Nakashima, Pensacola

RETIREMENTS IN 2013

Lawrence Blackwell, 29 years of service

Robert Moore, 22 years of service

Cecelia Arms, 22 years of service



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