

Delaware LabOrator



Winter 2015

Volume 40, Issue 1



DELAWARE HEALTH AND SOCIAL SERVICES
Division of Public Health

National Medical Laboratory Professionals Week 2015

To recognize our nation's 300,000 clinical laboratory science professionals who play vital roles in diagnosing and preventing disease, Governor Jack Markell proclaimed April 20-24, 2015 as Medical Laboratory Professionals Week.

Senator Bethany Hall-Long presented a Senate tribute to representatives of the University of Delaware Medical Laboratory Science Program, the American Society of Clinical Laboratory Scientists-Delaware Chapter, Siemens Healthcare, and the Delaware Public Health Laboratory, within the Division of Public Health.

Also during Medical Laboratory Professionals Week, the New York City Times Square super sign raised awareness about diagnostics' unsung heroes. The award-winning Lab Hero campaign, featuring Iron Man and Pearl Powers (a Marvel Custom Lab Hero created for Siemens), is a reminder that "the heart of a hero beats in every lab professional."



Inside this issue:

LPAC Spring 2015
Meeting
Pages 2-3

LPAC Fall 2015
Meeting
Page 3

Delaware Identifies
14th VRSA in U.S.
Page 4

Employee News
Pages 5-9



Sen. Bethany Hall-Long presented a Senate tribute during National Medical Laboratory Professionals Week in April. Pictured (from left) are: Mary Ann McLane, Clover Carlisle, Sen. Bethany Hall-Long, DPHL Microbiologist I Bobbi Turner, Kathleen Gibney, and DPHL Director Sergio Huerta, MD.

LPAC Spring 2015 Meeting Update

Margaret J. Zimmerman, lab manager I

The Delaware Laboratory Preparedness Advisory Committee met at the Delaware Public Health Laboratory (DPHL) on May 14, 2015.

VRSA Cases

Delaware Public Health (DPH) Infectious Disease Epidemiologist Paula Eggers and DPHL Laboratory Manager Gregory Hovan discussed how microbes come together and develop Vancomycin-Resistant *Staphylococcus aureus* (VRSA). VRSA arises when Vancomycin-Resistant *Enterococci* (VRE) shares a gene with its distant cousin, Methicillin-Resistant *Staphylococcus aureus* (MRSA). This can occur among patients who received prolonged treatment with Vancomycin. Those few patients not treated with Vancomycin and who do acquire VRSA tend to be exposed to the prolonged administration of other antimicrobials, which can also trigger the genetic transfer.

Between 2002 and 2012, 13 cases of VRSA occurred in the United States. The last three among these occurred in Delaware. In February 2015, the fourteenth case of VRSA in the U.S. and the fourth case in Delaware was confirmed. The patient had various underlying health conditions for which Vancomycin had been prescribed twice.

DPH's epidemiologic investigation searched for evidence of transmission. DPHL collected and analyzed 49 surveillance swabs from close contacts. Only the original patient proved to have MRSA. Some specimens were sent to the Centers for Disease Control and Prevention (CDC) for additional confirmation. Using molecular methods, the MRSA obtained from the pa-

tient was genetically matched with the VRSA and had markers for the VRE plasmid. This suggested that both the VRE and MRSA directly contributed to the development of VRSA in the patient. For more information, see page 4.

2014–2015 Influenza Season

Emily Hanlin, DPHL laboratory manager, reviewed the 2014-2015 influenza season. The predominant strain (as elsewhere) was identified as influenza A/H3N2 with an overall positivity rate of more than 30 percent, which suggests that hospitals pre-screened samples prior to sending to DPHL.

Because specimen submissions have to be selected randomly for epidemiologic reasons, a request was made for hospitals to help to do so. It is important to submit all Influenza-Like Illness (ILI) patient samples to DPHL, regardless of the season.

UD Biosafety Program

Krista Murray, assistant director and biosafety officer of the University of Delaware's (UD) Department of Environmental Health and Safety, presented an overview of all services and responsibilities provided by her department. UD's environmental health and safety department has safety and safety compliance oversight of five campus locations: Newark, Wilmington, Dover, Georgetown, and Lewes.

A UD biosafety committee provides guidance and oversight for all programs to ensure regulatory compliance with statutes, including the U.S. Department of Agriculture (USDA) Select Agent Program, in which UD is a regis-



tered participant. UD biosafety programs cover biological disciplines, bioengineering, human health research, plant research, marine research, animal science, and food science. The university also maintains facilities that include two working farms, greenhouses with fully functioning bio-containment areas, the research vessel *Cape Henlopen*, and a biosafety level-three facility that has research laboratories and areas to house animals. In addition, UD's biosafety program reviews and comments on proposed domestic and foreign-based field studies by faculty, students, and staff.

Body Art

Dana LeCompte, environmental health specialist III with DPH's Community Environmental Health Services, presented Delaware's regulations for commercial art services. Body art includes body piercing, branding, and tattooing. The state developed standards for body art practices to protect the public. The regulations include guidance for what is required from owners of body art shops. These address pre-operational requirements, general compliance procedures, operational requirements, and client and record retention. Each establishment must adhere to strict rules that

Continued on page 3

Continued from page 2

call for proper surface cleanliness, vector control measures, ventilation, hand washing sinks, waste receptacles, proper instrument handling and maintenance, supply storage, and exclusion of animals in work areas (except service animals). To receive a permit, an individual demonstrate knowledge of universal safety and health precautions, skin disorders, skin diseases, and infectious disease spread and control.

The audience participated in a body art demonstration by personnel from Walls of Wonder of Dover. Business Manager Codi Canasa showed everyone the preparations made prior to a piercing. Forms are completed and the artist talks to the client to explain what will happen, answer questions, and put the person at ease. The artist spreads the tools out on a sterile surface and wears gloves. The field is then cleaned with antiseptic and the piercing is completed, followed by placement of jewelry. Charles 'Chuck' Tucker,

owner and operator of Walls of Wonder, demonstrated tattooing. He introduced everyone to the tools of the trade including a "gun" that can use a variety of needles to produce lines of different widths. With this "gun," a tattoo artist can create almost any image on human skin using special inks. Both Canasa and Tucker invited the audience to try piercing an artificial ear or lip and tattooing a melon rind.

Preparedness Exercise

Marion Fowler, DPHL microbiologist II, summarized the recent College of American Pathologists Laboratory Preparedness Exercise (LPX) shipped on April 6, 2015. Personnel from Delaware's sentinel laboratories participated in the exercise. This provides an excellent teaching opportunity to identify bacterial bioterrorism (BT) agents. A BT agent workshop will be held in spring 2016.

LPAC Fall 2015 Meeting Update

The influenza season, DPHL participation in the U.S. Department of Defense anthrax investigation, and more were topics discussed at the Oct. 22 LPAC meeting.

Influenza Surveillance

DPHL Laboratory Manager Emily Hanlin reviewed the Annual Seasonal Influenza Surveillance protocol. DPHL requested that submitted specimens contain at least 600 microliters (μ l) and not be pre-screened for positivity because this shows the predictive aspects of the data that is collected.

Regarding Influenza A/H5 and A/H7 in the U.S., DPHL will assist the U.S. Department of Agriculture (USDA) and the Delaware Department of Agriculture (DDA) in enhancing monitoring plans and functions of employees dispatched to cull flocks. No birds have been planned for testing at the DPHL.

Liz Warren, DDA's avian health coordinator, reminded attendees that the highly pathogenic form of the avian influenza virus is extremely infectious and fatal to chickens, turkeys, pheasants, quail, ducks, and geese. Even so, with proper preparation of meats and eggs, food is safe to eat. So far, no human health effects have been detected from strains identified in the U.S. Avian Influenza Plans include protocols for the detection, control, containment, eradication, and area-disinfection and cleaning if the virus is found in Delaware's domestic bird population.

Individualized Quality Control Plan

Tim Smith, DPHL laboratory certification and compliance specialist, provided an update of the Individualized Quality Control

Plan (IQCP) set forth by the Clinical Laboratory Improvement Amendments (CLIA). The new IQCP is a broader and more flexible approach than the Equivalent Quality Control (EQC) approach. IQCP is effective January 1, 2016, and EQC will no longer be acceptable.

Inadvertent *Bacillus anthracis* delivery

DPHL Director Sergio Huerta, MD, discussed the experiences and lessons learned from DPHL's May response to the inadvertent delivery of live *Bacillus anthracis* from a Department of Defense laboratory to a private research laboratory in Delaware. LPAC members discussed the expected and unexpected procedural challenges, how to better understand the level of resources needed to address this type of event, and the need to develop practical and easily implementable plans.

Salmonella newport Surveillance Project

DPHL Microbiology Laboratory Manager Greg Hovan and DPHL Epidemiologist Amanda Bunkek discussed the DPHL Surveillance Project for *Salmonella newport*. The CDC, in an effort to enhance human illness surveillance, is now using the latest molecular technology, Whole Genome Sequencing. This technology is capable of rapidly identifying organism sub-clusters. It facilitates traceback of contaminated organic products and enhances environmental assessments.

Delaware is one of six states that submit results involving *S. Newport* from clinical sources to the CDC. To date, 21 cases were identified in Delaware, in addition to 275 cases in 29 other states and the District of Columbia.

Delaware identifies 14th VRSA in United States

Gregory Hovan, lab manager, microbiology

On February 26, 2015, DPHL was notified by a reference hospital that a potential case of vancomycin resistant *Staphylococcus aureus* (VRSA) was identified in a 67-year-old woman who presented a chronic ulcer on her right great toe.

By March 3, DPHL confirmed the finding, and the organism was immediately shipped to the Centers for Disease Control and Prevention (CDC) for additional testing. On March 10, the CDC also confirmed the finding. This became the 14th case of VRSA identified in the United States.

In the U.S., VRSA was first identified in Michigan in 2002. By 2009, Michigan identified seven additional cases. During this time, Pennsylvania and New York also identified one case each. In 2010, Delaware identified the most recent four isolates.

Staphylococcus aureus is a gram-positive coccus commonly found on the skin and upper respiratory tract (inner nose and throat). Although it is not always pathogenic, it has the capability of promoting infections by secreting a variety of protein-based toxins. Clinically, these infections can present as food poisoning, bacteremia, and toxic shock¹. Usually, boils, abscesses, wound infections, localized and extended skin infections, and infections of bones, joints, lungs, and body organs are found.

Staphylococcus was first identified in 1880 in Aberdeen, Scotland by surgeon Sir Alexander Ogston in pus obtained from a knee abscess following surgery. Over time, failed efforts to treat this organism using beta-lactam antibiotics, such as penicillin, proved that the bacteria was beta-lactam resistant. For this reason, Vancomycin, a member of the glycopeptide family of antibiotics, was used as a last defense to treat the infection.

Other organisms were also identified as having resistance to Vancomycin, such as *Enterococcus* spp. or Vancomycin-resistant *Enterococcus* (VRE), identified in the 1980s.²

Enterococcus is part of the normal intestinal flora and the environmental flora. Much like *Staphylococcus*, it can cause human health impacts, particularly in health care settings. The organisms can mutate the *van* gene to develop vancomycin resistance. Six possible mutation mechanisms (*vanA*, *vanB*, *vanC*, *vanD*, *vanE*, and *vanG*)³ have been identified.

Research has found that the *van* gene can be shared among organisms via a plasmid, a circular segment of DNA transferred between organisms. This is one of the paths that VRSA uses to acquire *van* gene resistance. VRSA also has the

mecA gene that confers methicillin resistance – i.e., methicillin resistant *Staphylococcus aureus* (MRSA). Due to this link and even though there is relatively low risk, when a patient presents with VRE and MRSA, there is potential for VRSA to develop.

Clinical status plays a key role in patients with infections of these types of organisms. Among them are the patient's age – generally between 40 and 83 years – particularly if the patient has one or more underlying co-morbidity or when the patient has taken Vancomycin or other antimicrobial for several months.

The patient who accounted for the fourteenth case of VRSA presented with end-stage renal disease and other health issues, including diabetes, CVA (wheelchair-bound), morbid obesity, congestive heart failure, and others. Dialysis was taking place three times per week and during hospitalization, between March and July, 2014, the patient received six doses of Vancomycin per month.

On March 11, the DPH Office of Infectious Disease Epidemiology contacted the DPHL about testing specimens from this patient as part of a contact investigation to determine if any transmission of the organism had occurred between the patient and various persons who had interacted with the patient in and out of the hospital. These included health care workers, other hospital patients, family members, and friends. To date, no evidence of person-to-person transmission has been found.

The DPHL tested 49 swabs taken from the nares and groins of 29 individuals. All tested negative for VRSA. Upon further testing, the patient proved to have MRSA.

At the CDC, tests were done using plasmid markers. This established a link between the recent MRSA and the original VRSA identified while at the hospital. It also demonstrated that VRE and MRSA could each use the other's genetic material to develop VRSA in the patient.

The CDC developed this case, which was published in the Sept. 25, 2015 edition of the *Morbidity and Mortality Weekly Report* (MMWR).

References

1. Diagnostic Microbiology, Bailey and Scott, 12th ed. 2007
2. Robinson, D. Ashley; Feil, Edward J.; Falush, Daniel (2010-03-16). [Bacterial Population Genetics in Infectious Disease](#). John Wiley & Sons.
3. Fong, I. W.; Drlica, Karl (2007-11-15). [Antimicrobial Resistance and Implications for the 21st Century](#). Springer Science & Business Media.

EMPLOYEE NEWS

DPH Employee of the Quarter – Patricia Scott

January – March 2015

Congratulations to DPHL employee Patricia Scott for being named Employee of the Quarter for the first Quarter of 2015. Pat was honored for her achievements at DPHL in newborn screening. DPH Director Dr. Karyl Rattay presented Pat with a handsome plaque at an employee recognition ceremony.

Pat began working for the State of Delaware 30 years ago at the Delaware Hospital for the Chronically Ill (DHCI) where she managed all laboratory testing for more than 300 patients. In 1990, Pat was instrumental in moving the hospital laboratory from DHCI to the new DPHL building. In 1998, testing for DHCI patients was contracted out and she transitioned the lab and staff to perform newborn screening testing for the state. DPHL received its first newborn screening specimens on June 30, 1999. At that time, roughly 25,000 specimens from approximately 12,000 newborns were tested for four disorders. Today, DPHL tests for more than 40 disorders on every baby born in Delaware.

Pat has consistently kept herself up-to-date regarding newer, more effective, and increasingly complex testing methodologies. She implemented newer protocols to the benefit of our state: Tandem Mass Spectrometry (2002), Molecular testing for Cystic fibrosis (2009) and Severe Combined Immunodeficiency (SCID - 2011). To this day, Pat keeps the newborn screening lab on the cutting edge of laboratory science.

More recently, Pat became a significant contributor to the implementation of HL7 messaging, an electronic form of reporting newborn screening results to hospitals and physicians. To achieve this, Pat learned Logical Observation Identifiers Names and Codes (LOINC), and how to decipher lengthy computer message scripts to ensure accuracy. In the process, Pat discovered that certain analytes/disorders had no coding registered with the National Library of Medicine, so she helped that organization develop and register the necessary codes.

Due to her subject matter knowledge and interest in helping other states with the process, Pat now co-chairs Health Information Technology, working with two national organizations, the Association of Public Health Laboratories (APHL) and New-STEPs.

Pat also serves on the American Public Health Laboratory Newborn Screening Committee and is a member of the Association of Public Health Laboratories' Newborn Screening and Genetics in Public Health Committee. She speaks at national conferences and has been involved with a federally-directed multi-state effort, the New York-Mid Atlantic Consortium for Genetics and Newborn Screening Services, since its inception in 1990.

Pat is deeply committed to ensuring the accuracy of results and rapid turn-around times from specimen collection to reporting results for all "her babies." The newborn screening lab boasts one of the shortest turn-around times in the nation, allowing physicians to treat children promptly and avert serious and lifelong health consequences for infants and their families.

Pat's leadership skills, innovative outlook, ethics, and technical superiority are evident in her section and staff, who are always prepared to take on complex challenges. Under Pat's management, the newborn screening lab improves the health and saves the lives of babies by screening them for genetic disorders and facilitating early medical treatment. Congratulations, Pat!



DPH Director Dr. Karyl Rattay presented Pat Scott with her Employee of the Quarter award for the first quarter of 2015.

Staffing Updates

Diane Hindman

DPHL is sad to see Diane Hindman retire from the Clinical Microbiology section. Diane worked at DPHL for over 20 years and was regarded by many throughout the state as an expert in tuberculosis testing. Diane graduated from the University of Delaware with a degree in medical technology and worked for 41 years in the field of microbiology. Prior to DPHL, the majority of her career was at Kent General Hospital as the microbiology supervisor. Diane is enjoying life in Slaughter Beach, where she spends her downtime watching the herons and ospreys, and welcomes family and friends to join her. She is a regular volunteer at the DuPont Nature Center and the Horseshoe Crab Sanctuary where she reconditioned microscopes found in storage. Diane is continuing her education by looking at plankton, diatoms, and other water critters previously unknown to her. We bid a fond farewell to our great colleague.

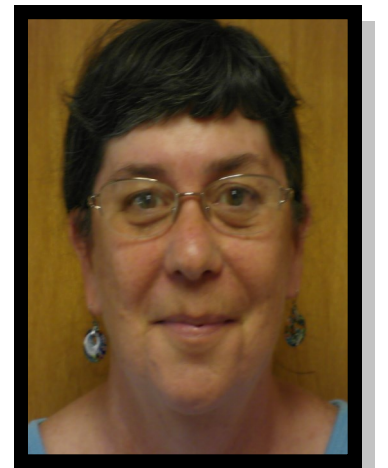


Charity Mabrey

Charity Mabrey left DPHL's environmental laboratory in May 2015 and took a position as an environmental health specialist III for the Division of Long Term Care Residents Protection. Charity started at DPHL in May 2012 as a microbiologist in the Water Bacteriology Laboratory. Charity oversaw the water microbiological testing, served as the microbiology certification officer for Delaware, and was the State's FDA laboratory evaluation officer for the presence of antibodies in milk. She will be missed and we wish her luck with her new position.

Roberta Wessells

DPHL welcomes Roberta (Robin) Wessells as our operations support specialist. Robin transferred to us from the Department of Transportation, and previously worked at the Delaware Hospital for the Chronically Ill. Her hobbies include crabbing, archery, scraping, and horseshoes. She loves to drive her muscle car (a 2014 Dodge Challenger). Along with her husband and son, the love of her life is her little dog, Beau. Robin is very personable. Welcome her aboard.



Continued from page 6



Laura Franze

The environmental laboratory welcomes Laura Franze. Laura joined us in February 2015 as a laboratory technician II and was selected as microbiologist II in June 2015. Laura served as a medical laboratory technician in the Navy for 12 years. She was a teacher for all sciences for middle school and high school students at Calvary Christian Academy for the past 15 years. Laura enjoys spending time with family, reading a good book, and going antiquing. Welcome, Laura.

Bill Spinden

The Delaware Public Health Laboratory (DPHL) welcomes Bill Spinden to the Clinical Microbiology section as a microbiologist II. Bill was born in Wilmington and served in the Navy from 1985 to 1991, with service in Saudi Arabia during Desert Storm. Bill previously worked at AstraZeneca, performing sterility testing. He joined the state at the Porter State Service Center. Bill moved to the environmental chemistry laboratory at DPHL in 2006 to perform residential water testing. Bill is married, has a son, and enjoys fishing and camping. Join us in welcoming Bill to the clinical microbiology team.



Joshua Barth

DPHL welcomes Joshua Barth as a microbiologist II in the Clinical Microbiology section, primarily performing Tuberculosis testing. Joshua received his Bachelors of Science in Natural Resources from Delaware State University and is currently pursuing his MS in Environmental Science. Joshua was previously with the National Oceanic and Atmospheric Administration (NOAA) working with *Vibrio* spp. in the Delaware Bay. He also worked for the U.S. Fish and Wildlife Service. He is newly married (approaching their first anniversary) and he enjoys the outdoors (hiking, kayaking, birding, and camping) as well as college football (Go Cornhuskers!). Join us in welcoming Josh to DPHL.

Continued on page 8

Continued from page 7

Nikia Green

Nikia Green accepted a position in the environmental laboratory as a laboratory technician III in August 2015. Nikia is a 2013 graduate from Temple University with a bachelor's degree in biology. She worked at Eurofins QC lab in Pennsylvania for two years. She enjoys spending time with family and friends and watching movies in her free time. Welcome, Nikia.



Anthony Eng

In June 2015, Anthony Eng became a member of the Delaware Public Health environmental chemistry team as a laboratory technician III. A recent Rutgers University graduate, Anthony moved to Delaware from New Jersey. In his spare time, Anthony is often found riding his bike, exercising, or training in martial arts in Philadelphia, where he is the head instructor of the Philadelphia Wing Chun Kung Fu School. Anthony is bright, friendly, and is an avid comic enthusiast and game player. You can often find him at the lab running multiple tests on water samples. He is always willing to give a friendly hello. Welcome, Anthony.

Delaware Public Health Laboratory

30 Sunnyside Road
Smyrna, DE 19977

302-223-1520

Fax: 302-653-2877



Built: 1990

Business Hours: 8:00 a.m. – 4:30 p.m.

Purpose: The Delaware Public Health Laboratory offers consultation and laboratory services to state agencies, including these Delaware Health and Social Services, Division of Public Health programs:

- HIV surveillance and prevention
- Immunization
- Lead
- Epidemiology
- Newborn Screening
- STD prevention
- TB Elimination
- Drinking water
- Preparedness

Karyl T. Rattay, MD, MS, Director
Delaware Division of Public Health

Sergio Huerta, MD, Director
Delaware Public Health Laboratory

Christina Pleasanton, MS, Deputy Director
Delaware Public Health Laboratory

If you have questions regarding these articles or would like to receive a hard copy of this newsletter, contact the DPHL at 302-223-1520.

To receive this newsletter by email, contact Cathy Moore at cathyj.moore@state.de.us.

Find us online:

www.dhss.delaware.gov/dhss/dph/lab/labs.html

*“To Protect and Enhance the
Health of the People of
Delaware”*