

DELAWARE LABORATOR

Summer

2011



LABORATORY PREPAREDNESS ADVISORY COMMITTEE MARION FOWLER, MICROBIOLOGIST

The Laboratory Preparedness Advisory Committee met on May 24, 2011 at the Delaware Public Health Laboratory (DPHL). The meeting was well attended with representatives from many state agencies, laboratory partners and Division of Public Health (DPH) staff.

First to speak was Tara Lydick, Chemical Terrorism (CT) Coordinator, with a CT update. Blood and urine collection protocols for a chemical-exposure event were reviewed, including the procedure for packaging and shipping of blood and urine specimens to the Centers for Disease Control and Prevention (CDC). For a radiological/nuclear incident, urine collection and packaging and shipping CDC charts were discussed. For cases involving clinical or infectious specimens, several new and revised packaging and shipping rules were presented. Several of the packing instruction numbers have changed. Also, all carriers now require that the shippers declaration form must be electronic, not hand written. Refresher package and shipping courses are available from the DPHL as a live teleconference. Only personnel who have completed the original training may take a refresher course. Teleconferences were held on May 17 and 27, June 16 and 29, 2011 from 9am -12pm.

A review of last year's influenza season was given by Emily Outten, Marjorie Shannon and Paula Eggers, (Virology Manager and DPH Epi-

demiologists). Between October 2010 and May 2011, there were approximately 2,500 samples tested for flu. Aside from the pandemic year, this was one of Delaware's busiest flu seasons! This flu season demonstrated a nearly 50/50 split between flu A/H1N1 and flu A/H3N2. About 23% of flu positives were also positive for flu B, mostly type Brisbane. There were approximately 8-10 specimens that were B/Florida which was not in the influenza vaccine. Therefore, a very small percentage of individuals may have gotten the vaccine but still became ill with influenza B. Because there were ample circulating strains of both As and Bs, some individuals became ill twice within the season, once with each strain. DPHL received flu specimens from all of Delaware's hospitals and many sentinel physician's offices. Every other week, DPHL sent 5 specimens to New York for pyrosequencing for detection of mutations for tamiflu (Oseltamivir) resistance. DPHL has just completed the process of validating our pyrosequencer and will be able to perform this resistance testing for the next flu season.

Paula Eggers discussed the recent meningococcal case at the University of Delaware. DPH Epidemiology, Student Health Services, Christiana Care staff, laboratorians and CDC worked together to achieve a positive outcome in a very short period of time. The student resided in a fraternity with 30 other members. All 30 members were given prophylactic treatment along with 20 other close contacts.

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The student had received the vaccine three years previously, but the strain identified is not included in available vaccines. The patient recovered rapidly with no ill effects. Since meningitis can be life threatening the patient was given an antibiotic prior to a spinal tap being performed thus the organism was nonviable. The spinal fluid was shipped to CDC for real time PCR for meningococcal detection. This testing was critical in confirming the diagnosis of this infection to establish a confirmed case for CDC reporting.

Stephanie Belinske, DPH epidemiologist, provided an "Overview of the 2010-2011 Norovirus Season". There were 518 reported cases of gastroenteritis during this time period. The cases came from long term care facilities and family function attendees. The two family functions consisted of a going-away party and a funeral luncheon. The DPHL tested all the submitted stool specimens using real time polymerase chain reaction (PCR) to confirm the diagnosis.

Delaware had a case of *Mycobacterium bovis* in a patient this year. *M. bovis* is in the *Mycobacterium tuberculosis complex* group. Because *M. bovis* is normally an animal pathogen, several state agencies, including the DPH TB program, DPHL, the Department of Agriculture, Poultry and Animal Health were involved. Dr. Heather Hirst, State Veterinarian of Delaware, gave a presentation detailing *M. bovis*, a chronic disease mostly found in cattle. Humans can become infected when cattle shed the organism in respiratory secretions, feces, milk, urine, vaginal secretions or semen. However, there have been a few cases of human-to-human and human-to-cattle transmission. The agricultural TB eradication program has given 46 states the status of bovine "TB Free". Delaware is one of these states and the health of Delaware's cattle is one of Dr. Hirst's primary concerns. It was important to determine if the patient came in contact with, or infected, any cattle with *M. bovis*.

The patient's health and the possibility of human-to-human transmission is the priority of Jeannie Rodman, nurse consultant for the DPH TB program. *M. bovis* cannot be con-

firmed by normal cultural methods at the DPHL. The patient's original smear was acid-fast positive indicating a possible Mycobacterium species. The real-time PCR and nucleic acid hybridization testing were also positive, indicating the organism was in the *Mycobacterium tuberculosis complex*. Using conventional susceptibility testing, the organism was found to be resistant to pyrazinamide which is consistent with *M. bovis*. The CDC performed molecular detection of drug resistance, genotypic assays and spoligotyping on the organism to identify the organism as *M. bovis*, not *bovis BCG* (vaccine strain). The patient was from Mexico and may have ingested unpasteurized milk products, the probable cause of his disease. From the agricultural view, the patient had not had any contact with cattle since his move to the US about a year ago. This case was the first *M. bovis* in Delaware since genotyping was initiated. Fast and efficient cooperation between all agencies led to a quick and accurate diagnosis for the patient.

Basha Silverman of Brandywine Counseling and Community Services (BCCS), described Delaware's Needle Exchange Program. The purpose of the program is to provide free sterile syringes in exchange for used syringes. This helps to reduce the transmission of HIV, Hepatitis C, and other blood-borne illnesses to injection-drug users. Once the clients are at the site, BCCS can also provide an array of other services including referrals to drug treatment, medical care and other social services that the clients may not seek on their own. This program helps to reduce the spread of disease from drug users to their partners, their family members and children. This program is critical because Delaware is sixth in the country for HIV infection rate per capita. Injection drug use is one of the most frequent modes of transmission of HIV in Delaware.

Lastly, Marion Fowler, Microbiologist, gave a presentation on bioterrorism (BT) updates, the College of American Pathologists-Laboratory Preparedness Exercise (LPX)

survey results and the sentinel laboratory exercise associated with the April 2011 LPX survey. Delaware's sentinel laboratories were tested during this LPX survey for their preparedness by two different means: ability to rule-out, or refer to DPHL, a possible BT agent and the timeliness of their contact with the DPHL to report a specimen when they were unable to rule-out a BT agent. All of Delaware's sentinel laboratories passed these tests in 2010 and in April 2011. According to many of the sentinel laboratories, the full day workshop "Agents of Bioterrorism: Annual Sentinel Lab Update", which includes a "wet" workshop using vaccine strains or attenuated strains of BT agents, has greatly contributed to the increased ability of the Delaware laboratories to function as sentinel laboratories.

At least once a year, sentinel laboratories are tested on their ability to package and send a rule-out BT agent to CDC. Annually, sentinel laboratories are required to submit a properly packaged container with all appropriate paperwork to the DPHL in conjunction with one of the LPX surveys. The package is transported by DPHL couriers to the laboratory where the package is examined and a checklist is used to determine the accuracy of the submitted package. Once all packages have been received and graded, Marion visits each hospital to review the checklist.



[www.dhss.delaware.gov/dhss/dph/
lab/labs.html](http://www.dhss.delaware.gov/dhss/dph/lab/labs.html)

EVALUATION OF GEN-PROBE'S APTIMA METHOD FOR THE DETECTION OF HIV-1 AT DPHL

EMILY OUTTEN, LAB MANAGER I

Nucleic Acid Amplification Testing (NAAT) uses transcription-mediated amplification technology to detect many disease conditions, including HIV. Using this methodology, the initial reaction uses reverse transcriptase, an RNA-dependent DNA polymerase, in order to form a complementary DNA sequence. The dsDNA is used in a second step, along with RNA polymerase, to exponentially produce increasing copies of RNA amplicon. The goal of amplification technologies is to produce large numbers (sometimes in the millions), of nucleic acid sequences that are in the original sample in small numbers.

The instrumentation being evaluated (Aptima) had previously been used in Microbiology at the Delaware Public Health Laboratory (DPHL) for chlamydia and gonorrhea testing, but was replaced by the automated Tigris system, thus allowing DPHL to conduct the study without having to purchase costly equipment. The current DPHL HIV

algorithm includes repeating all positives using the Uni-Gold™ Recombigen® HIV rapid test, and confirming with the Bio-Rad GS™ HIV-1 Western Blot. The NAAT methodology was evaluated to be used as a screening test and/or confirmation, effectively replacing the time consuming Western Blot. The advantage to this method is clearly that it may detect HIV positivity as early as 25 days prior to the Western Blot.

The study was conducted over a 9 month period, on pooled plasma and serum specimens collected by DPH clinics. After careful consideration and the following evaluation, it was decided that the Aptima is not optimal for our HIV testing situation. DPHL does not receive a high enough volume of samples to warrant using this method and running in batches, and running individual specimens would be cost prohibitive. Additionally, there has been no directive from CDC to

replace the Western Blot as a confirmatory method, despite its weaknesses.

Positive aspects of the Aptima include the ability to still detect HIV-1 easily when pooled. This makes NAAT technology ideal for high throughput laboratories that may need to pool specimens to keep up with extremely high volumes. In rare instances, DPHL has seen positives from the rapid screening method not confirm by Western Blot. The Aptima could potentially be used as a secondary confirmation, but these occurrences are extremely infrequent, usually once every few years.

For the reasons given above, the NAAT method is not a recommended option for DPHL at this time. Should sample volumes increase in the future, it may be worth re-examining.

DPHL CELEBRATES NATIONAL MEDICAL LABORATORY PROFESSIONALS WEEK

DEBRA RUTLEDGE, MBA MT(ASCP), INFECTIOUS DISEASE LAB MANAGER II

The Delaware Public Health Laboratory (DPHL) celebrated National Medical Laboratory Professionals Week during the week of April 18th. That was actually a week early due to many schools being closed for spring break during the last week of April. This year's focus was promoting scientific careers in school aged children. The lab invited all schools to participate in the annual open house tour of the facility on Wednesday, April 20. We were excited to have so many people tour the lab, ranging from an impressive class of science honors students from Smyrna Middle School to Delaware legislators including: Representatives William Carson, Harvey Kenton, Dave Wilson, Lincoln Willis, Bruce Ennis, Earl Jaques and Ruth Briggs-King.

To kick off the open house, Delaware Public Health (DPH) associate deputy director, Dr. Paul Silverman, thanked and congratulated laboratory staff for all their hard work. He introduced the laboratory's interns, Wayne Flenniken, who worked in the Chemistry sections and Sabrina Youngblood who rotated throughout the laboratory and other public health sections. Dr. Silverman also introduced the lab's partner exhibitors: DE National Guard 31st Civil Support Team, the Odessa Fire Company's Field Decontamination Unit, DNREC Emergency Response, Bureau of Epidemiology, Preparedness, Lead Poisoning Protection, Office of Drinking Water, Office of Food Protection, Health Systems Protection, Tuberculosis Elimination Program, Tobacco Prevention & Control, Sexually Transmitted Disease Program, the SPCA and the DPH

Environmental Health Emergency Response Branch. Vendor exhibitors included: Fisher Scientific, Trinity Biotech, Gen-Probe, and Perkin Elmer. Guest speaker, Secretary of Education, Dr. Lillian Lowery spoke about the importance of science education and the Governor's initiatives designed to improve student performance, support teachers and ensure Delaware's children graduate ready to succeed. Delaware Health & Social Services Secretary Rita Landgraf discussed DPH's collaborations with the Association of Public Health Laboratories (APHL), the Centers for Disease Control and Prevention (CDC), the Food Emergency Response Network (FERN), and Christiana Care. She also discussed training opportunities through the APHL and the CDC. Dr. Karyl Rattay, Division of Public Health Director,

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Lab Week cont'd

spoke about the DPH Laboratory's many roles in disease outbreak prevention, Newborn Screening, testing public and private drinking water, and Chemical and Biological Terrorism. She thanked laboratory staff for their many achievements during the past year. The Newborn Screening staff had a special visitor, a child diagnosed with Phenylketonuria who had been identified by the Newborn Screening program. She presented our staff with a thank you gift and gave us a cute photo to add to our wall. The Odessa Fire Company was able to provide 44 retired HazMat suits from the New

Castle County Technical Decon. Team, for visitors, which made quite a sight with school kids outfitted in the parking lot.

The lab week committee worked very hard on the preparations for the open house and also planned activities for the lab staff to enjoy throughout the week. We had trivia contests, an Eye Spy photo game, The Amazing Lab Race, crosswords and puzzles with prizes for all winners. The lab raised money in house to help support a catered lunch for employees, breakfast with waffles, pizza lunch and Sundae bar throughout the

week. Laboratory staff participated in a spring egg hunt on the lab grounds to end the week. We would like to thank all the laboratory staff for the excellent commitment they provide daily to the citizens of Delaware.

From left to right: Rep. Harvey Kenton of Milford, Senator Bruce Ennis of Smyrna, Rep. Dave Wilson of Bridgeville, Christina Pleasanton, Deputy Director of DPHL and Pat Scott, Newborn Screening Lab Manager



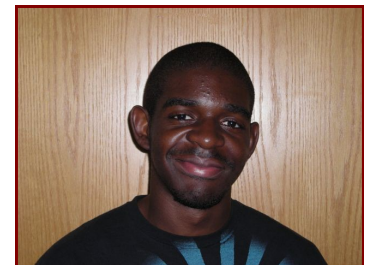
*Dr. Lillian Lowery
Secretary of the Department
of Education*



*Rita Landgraf
Secretary of the Department of
Health and Social Services*



My name is Karl Fomundam and I am currently a junior at the University of Delaware. I am in the Medical Technology Department and will graduate with the class of 2013. My goal is to attend medical school with a specialty in pediatrics. In my spare time I love to play sports, especially soccer. I also enjoy playing video games and watching movies. I am currently enjoying reading many motivational books in my spare time as well. I live in Smyrna, DE with my parents.

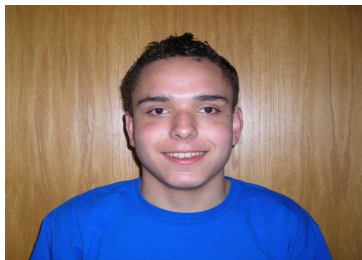


Intern Report



*And now a word from our
Interns*

Hello, I am Ryan Meredith from Camden, DE and I will be entering my freshman year at the University of Delaware as a biological sciences major. I have had a fascination with the medical field since I was a small child. One day my father and I were watching a TV show about the Ebola virus and I was amazed how something so small could cause so much harm. Since that day, I wanted to pursue a career that would allow me to both understand and combat deadly pathogens. I am fairly certain that I wish to go to medical school in order to pursue a M.D., so I decided to take an internship at the Delaware Division of Public Health. I am torn between my desire to help people recover by becoming a practicing physician and my interest in laboratory analysis of microscopic threats. When I volunteered at Kent General Hospital, I transferred patients from room to room. I gained knowledge from the doctors there on current medical practices in addition to social interactions with the patients. I loved what I did. At the Division of Public Health, I have only worked for a little over a week and I equally love what I do. Never have I learned so much in such a short period of time! Learning how to perform the diagnostic tests for a plethora of pathogens has made me better understand the dangers we face in addition to what can be done to prevent them. I know that whatever I decide to do later in life will involve combating illnesses, whether in an ER, at a laboratory, or hopefully some combination of both. If anybody is ever looking for an internship that will immerse you in current diagnostic procedures, the Division of Public Health is the place to go!



EMPLOYEE NEWS

Welcome to the Lab!

Jordan Estes recently joined the molecular virology section as a Microbiologist II. She recently completed a CDC/APHL Emerging Infectious Diseases Training Fellowship at the University of Iowa State Hygienic Laboratory. Jordan earned a B.S. in biology and a B.A. in anthropology in 2010 from Salisbury University on Maryland's Eastern Shore. Born and raised in Maryland, she is glad to be back on the East Coast!



Brenda Hastings Chandler

I am a native of Delaware and earned my B.S. in Biology at Delaware State University. I worked 14 years in the Microbiology lab at the Department of Natural Resources in Dover. I then moved to the State of Maryland Department of Health and Mental Hygiene in Baltimore where I spent 5 years as a Public Health Lab Scientist Lead. I am happy to return to the State of Delaware as a Microbiologist II at the Public Health Lab in Smyrna. I am part of the microbiology section and am quickly being introduced to many clinical testing procedures. I will concentrate on Pulsed Field Gel Electrophoresis as my main area of responsibility.



DELAWARE'S DIVISION OF PUBLIC HEALTH LABORATORY



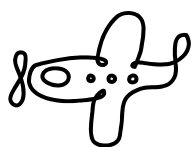
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Built: 1990

Business Hours: 8 a.m. – 4:30 p.m.

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

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



CONGRATS to Jianlin and Yaohong!!!

Analytical Chemists Jianlin Wang and Yaohong Zhang recently passed the EPA's Laboratory Certification Officers class! Yaohong is now certified to audit in the Inorganic area and Jianlin is certified for both the Inorganic and Organic areas. This class is quite difficult and required a lot of hard work. Congratulations and thank you to both Jianlin and Yaohong for a job well done!



Karyl Rattay, MD, MS, FAAP, FACPM,
 Director, Delaware's Division of Public Health

Christina Pleasanton, MS
 Acting 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 Delaware Public Health Laboratory at 302.223.1520. To receive this newsletter by email, contact Liz Moore, Editor, at liz.moore@state.de.us.

"To Protect and Enhance the Health of the People of Delaware"

