Clinical Laboratory Day Celebrates Tenth Anniversary!

Where can you reconnect with old friends, eat a great meal, get the latest information on laboratory topics, acquire a day’s worth of continuing education credits, and receive inspiration to head back into work another day? At Clinical Laboratory Day, of course!

The Laboratory Improvement Unit at the North Carolina State Laboratory of Public Health (NCSLPH) organizes this educational program each year for laboratorians and other healthcare personnel across the state. The event celebrated its tenth anniversary on October 3, with about 150 people in attendance. A new co-sponsor and new location helped to make this year especially exciting. The North Carolina Public Health Foundation (NCPHF) became the new co-sponsor and helped to organize the program at the Wake Tech Health Sciences Campus in Raleigh. The Foundation provided excellent assistance to Laboratory Improvement in organizing the event, and the new location in a modern and comfortable building received excellent reviews.

This year’s theme was titled “Start Taking Defense: The Battle against Sexually Transmitted Diseases.” Dr. Scott Zimmerman, NCSLPH Laboratory Director,
opened the program with a presentation on new recommendations regarding screening tests to detect Chlamydia trachomatis and Neisseria gonorrhoeae infections. Dr. Victoria Mobley, HIV/STD Medical Director of the North Carolina Communicable Disease Branch, reviewed important changes in the epidemiology of sexually transmitted infections (STI) in the state and emphasized the importance of extragenital nucleic acid amplification testing (NAAT) in controlling the HIV and STI epidemics. Dr. Marcia Hobbs, Professor of Medicine and Microbiology & Immunology in the School of Medicine at the University of North Carolina at Chapel Hill, reviewed new developments in the diagnosis of Trichomonas vaginalis. These three speakers were joined by Sherri Felts, regional Laboratory Improvement consultant, and Myra Brinson, manager of the State Laboratory Virology/Serology Unit, for a panel discussion to address any questions from the earlier presentations.

The day ended with a motivational presentation by Mr. Tim Dumas. Tim has spoken at several Clinical Laboratory Day programs, and his sense of humor and laboratory background always make him a favorite with the audience. This year, Tim addressed ways to inspire, motivate and communicate with personnel to accept change, resulting in positive outcomes in attitudes and relationships.

Throughout the day, refreshments were served, and a barbeque and grilled chicken lunch was catered by Papa Jack’s Pig Pickin in Raleigh. Participants were able to enjoy exhibits from ten vendors as well as several educational tables. Door prizes were awarded throughout the day, and all attendees received an umbrella as a departure gift.

Many participants indicated that the information presented through this event will allow them to better serve and educate their clients. Others indicated they will use the information to evaluate and update their testing. Overall, participants enjoyed the new location and look forward to future Clinical Laboratory Days!

Submitted by:
Patty Atwood, BSMT (ASCP)
Laboratory Improvement Coordinator
**Mycobacterium tuberculosis** as a Biological Weapon

Having spent almost the last five years working in the Bioterrorism and Emerging Pathogens Unit of the N.C. State Laboratory of Public Health, it was not hard to make the transition to the Mycobacteriology Unit. Continuing to think about the organisms, the laboratory facilities, and the training that I had received, an important question came to mind: “Is there a possibility that Mycobacterium tuberculosis, the causative agent of tuberculosis, could be used as an agent of bioterrorism?” Why would that question even cross my mind? Could it be that both units employ an increased level of containment in which to work with the organisms, or that the CDC categorizes the organisms worked with by both of these units for their possible use as biological weapons? The use of tuberculosis as a biological weapon is a credible threat.

Tuberculosis is an ancient disease with some scientists dating it back to over 9,000 years ago. Tuberculosis is contagious and is spread from person-to-person through the air. Tuberculosis usually affects the lungs, although it can also affect other parts of the body such as the brain, kidney or spine. Pulmonary tuberculosis is the most common form seen in developed countries. After Mycobacterium tuberculosis enters the body, it is possible that no infection occurs. If an infection does occur, the bacteria can remain dormant in the latent form or progress to clinical disease. Symptoms of tuberculosis infection include weakness, fever, night sweats, prolonged coughing, and chest pain. Hemoptyisis may be present. In 2013 in the United States, there were approximately 9,600 new tuberculosis cases reported, with 216 of those occurring in North Carolina. According to the World Health Organization (WHO), tuberculosis is second only to HIV/AIDS as the largest killer worldwide due to a single infectious agent. In 2012, 1.3 million people worldwide died from tuberculosis, of which 320,000 were HIV positive.

Biological weapons are those derived from bacteria, viruses, biological toxins, or fungi. Once manufactured, they can be deployed as biological weapons when paired with a system to deliver it to cause large numbers of deaths. Multi-drug resistant tuberculosis (MDR-TB) is considered a Category C biological agent by the CDC in regard to its potential for use as a bioterrorism agent to be used as a biological weapon. Category C biological agents are those that could be engineered for mass dissemination because of availability, ease of production and dissemination, and the potential for high morbidity and mortality. Anthrax is a Category A agent, and Ricin toxin and Q fever are both Category B agents. These require special action or enhanced diagnostic capacity.

Drug resistant forms of tuberculosis began to appear in the 1980s with the emergence of HIV. There were a high number of tuberculosis patients failing to complete a full course of treatment antibiotics. Also, when healthcare workers prescribed the incorrect treatment regimen, drug-resistant forms of tuberculosis emerged. MDR-TB is defined as being resistant to two of the main first-line drugs, isoniazid and isotreptomycin.
Mycobacterium tuberculosis cont. from page 3

rifampin. Eighty-six cases of multi-drug resistant tuberculosis were reported in the United States in 2013. Even though MDR-TB is treatable using second-line drugs (fluoroquinolones: e.g., ciprofloxacin, levofloxacin, moxifloxacin), sometimes second-line drugs are limited or are not available. The extensive treatment, which can take up to two years, is very costly and can produce toxic drug reactions in patients. An even more dangerous form of tuberculosis called extensively drug-resistant tuberculosis (XDR-TB) has arisen that is resistant to the first-line drugs (isoniazid, rifampin, ethambutol, and pyrazinamide), at least some of the second-line antibiotics, and any of the second-line anti-TB injectable drugs (amikacin, kanamycin or capreomycin). Actual production of tuberculosis as a biological weapon is believed to have begun in the early 1980s even before the emergence of drug resistant, multi-drug resistant, and extremely drug resistant tuberculosis. The WHO estimates that there were approximately 450,000 new cases of MDR-TB worldwide in 2012 of which 170,000 of those with the disease (38%) died. As of September 2013, 92 countries had reported at least one case of XDR-TB.

Any bacteria can be used as a biological weapon, but certain organisms are more likely to be used as a bioterrorism agent. Mycobacterium tuberculosis has been placed in the third highest classification group by the CDC as being propagated and disseminated to cause disease and even death. New types of antibiotic resistance in bacteria like MDR-TB and XDR-TB raise the level of awareness of the lethal properties of Mycobacterium tuberculosis. Some bacteria used as bioterrorism agents are weaponized to make them more lethal. Due to failure to complete antibiotic regimens or improperly prescribed antibiotic treatments, the bacteria is making itself more deadly. The drug resistant bacteria is easy and inexpensive to propagate, transmitted by person–to-person through aerosols, and has a moderate mortality rate—all things making the use of Mycobacterium tuberculosis as a biological weapon a possibility.

Submitted by: LaVonda Benbow, BS, MLT(ASCP)CM Supervisor, NCSLPH Mycobacteriology Laboratory

Scientific Services Unit Meets Many Needs

Who can make over 1,200 tubes and over 400 plates of media in one day? The answer is the Scientific Services Unit of the North Carolina State Laboratory of Public Health (NCSLPH), and this feat is accomplished with only three staff members! The Scientific Services Unit is located on the lower level of the NCSLPH, and it contains all the supplies and equipment necessary to prepare, autoclave, and dispense media, stains, and solutions needed throughout the building. The new building, occupied since January 2013, includes a large, modernized space for the Scientific Services Unit and houses two autoclaves, a modern dispenser instrument, and plenty of work counters and storage space.

The Scientific Services Unit prepares over 300 different types of media, stains, and solutions used throughout the laboratories at the NCSLPH. Having the capability to make media in-house is a vital service that supports the media needs of the State Laboratory. The Scientific Services Unit prepares media for Atypical Bacteriology, Bioterrorism and Emerging Pathogens (BTEP), Enteric, Lab Improvement, Mailroom, Molecular, Mycology, Parasitology, Serology, Special Bacteriology, Tuberculosis, and Virology laboratories. The clinical, environmental, and bioterrorism workshops presented by Lab Improvement rely heavily on the media made in-house. In 2013, the Scientific Services Unit prepared 8,000 sheep blood agar plates and 6,000 tubes of viral transport medium. The Scientific Services Unit also does quality control on some of the media before distribution to the various laboratories ordering media.
In addition to supplying the clinical laboratories with media, the Scientific Services Unit also prepares media for the Environmental Microbiology laboratory. This laboratory has the option of ordering over 30 different types of media or solutions prepared by the Scientific Services Unit. The unit performs quality control on over half of these. Media prepared for use in environmental laboratories has stricter requirements and requires a different set of log sheets. Because the Scientific Services Unit prepares media for use by both clinical and environmental laboratories, they are regulated by the Environmental Protection Agency (EPA), Food & Drug Administration (FDA), and Clinical Laboratory Improvement Amendments (CLIA). They are inspected by the EPA and FDA every three years, and by CLIA every two years.

Having a unit in the NCSLPH that can prepare general use and special media, stains, and solutions ensures that the many laboratories in the building are equipped to handle day-to-day operations. The Scientific Services Unit provides a much needed and always appreciated service to their internal customers.

Submitted by:
Diana Scarborough,
Laboratory Improvement Lab Manager
High School Interns Benefit from State Lab Experience

This past summer, staff at the North Carolina State Laboratory of Public had the pleasure of mentoring two rising seniors from Athens Drive High School in Raleigh. The school provides a Health Sciences Career Academy for students interested in science and healthcare fields. Farhin Shaikh and Sohil Shah worked with numerous laboratory staff members to learn more about the function of a public health laboratory. The students proved to be bright, enthusiastic and full of questions! At the end of their internship, both presented excellent overviews of their experience to laboratory staff and submitted the following articles for the newsletter:

Farhin Shaikh writes:
When I first began my journey at the State Laboratory of Public Health (SLPH) over the summer, I was very eager to be a part of something big, something very few people get to be a part of. I did not expect the enormity of the impact the lab had on public health, nor did I expect the enormity of the building itself. I was entering a whole new realm known as the workplace in which the standards were at an all new level. My first day at the SLPH was one that I will never forget, as it marked the beginning of my professional career. I learned many valuable lessons from my time at the lab, and I am sincerely appreciative of everyone that contributed to making my summer an amazing one.

My internship experience consisted of three phases, all of which I enjoyed. In phase one, I got the opportunity to meet almost everyone that worked at the SLPH, and I can say that I have never met a more cordial and welcoming group of people anywhere else. Everyone at the lab is very passionate about what they do and more than willing to pass on knowledge of their field of expertise. After getting to see all the parts of the lab, I realized the importance of the contributions made by the people in this lab. I truly believe that the good people of the SLPH are heroes in disguise that are kind, modest and caring people. They say they are just “doing their job,” but they are doing so much more for so many people.

In phase two, I was able to spend a little more time in Microbiology, a department that sparked my interest. I got the amazing opportunity to spend three days in the Mycobacteriology Lab and learn about tuberculosis. There, I gained valuable knowledge of how a Biosafety Level 3 lab works, as well as the precautions taken to make sure everyone outside of the lab is safe, too. I got to work with some amazing teachers who are very enjoyable people to spend time with. I also got to attend an awesome microscopy workshop conducted by the splendid Lab Improvement Team.

Phase three was my chance to give back to the SLPH by working on a project that would benefit the lab in some way. I worked in Chemical Terrorism and Hemachemistry for a week, helping to run daily tests on some of the most high-tech equipment I have ever encountered. I was very fortunate to have experts teach me how to run machines that most people won’t see until after college. I helped to contribute as much as I could in the lab, and hopefully I was able to give back even a fraction of what the SLPH has given me.

After spending four weeks at the State Lab of Public Health, I have learned the benefits of having good communication and presentation skills, working to solve problems as a team, and the importance of having a career that captures my interest. I have been fortunate enough to be able to work with passionate and dedicated individuals that made me look forward to coming to work every day. My experience at the SLPH was a remarkable one that I hope others get to share in the future. I will never forget my time at the SLPH, and I thank everyone for the impact that they have had in my life.

Sohil Shah writes:
I’ve always been fascinated by science. Specifically, I have always been fascinated by science in which I can get real life experience. Coming from high school, I don’t get many, if any, opportunities to learn hands-on. However, after interning at the lab this past summer, I have satiated my interests in science and research and

Cont. on page 7
extoled them to greater heights as I now apply to college.

When I came to the lab this summer, I knew little about what I was getting myself into. I fondly remember saying before the internship, “I want to be an epidemiologist.” Although that interest still looms, my experience in the lab has allowed me to investigate careers in the environmental sciences, biological terrorism, and even microbiology. I have learned how to test for coliform in water, I have composited air filters, and I have even learned the process to test for Salmonella. These are all things I did not understand before walking into the lab. If anything, I have learned from the lab that it is utterly important to be open-minded to the different opportunities in lab sciences.

On my first day, I remember Dr. Zimmerman saying, “At the end of the day, we provide to the community.” I have learned and even forgotten a great deal of skills, facts and knowledge, but this one sentence has still stuck with me. I believe that the lab acts as a safety net. It is an environment designed to protect and save others. The lab may not see patients or illnesses firsthand, but the lab’s function is just as important. The lab works tirelessly behind the scenes to provide for the betterment of the community through testing, analysis and hope. The newborn screening unit saves thousands of children each year just by running tests. The environmental science unit protects the community from harmful dairy products. The people who work in the lab may not be known, but the work they do is much more important. And I want to be just like them.

As I go on to college, it is safe to say that this experience has only heightened my interests in lab sciences. I do not know where I will attend, nor do I know what I want to major in. But I do know one thing: in eight months I will graduate high school, in four years I will graduate college, and shortly after, I hope to be making a difference in the community.

This internship has been more than I could have asked for. I am truly grateful for all those who have made this an unforgettable experience. I am truly thankful to those lab employees that were able to spend time with me and explain their work. If I could list out names to thank everyone I would, but I think I would run out of paper. I have learned, executed and applied many skills throughout this internship, and I know they will come to good use in the future.
During the months of June and July, the Cancer Cytology Unit hosted a student intern, Jamar Thomas, in partnership with the cytotechnology program at Central Piedmont Community College in Charlotte, North Carolina. When asked about his favorite part of training in cytotechnology, Jamar commented, “I have enjoyed learning about each body system….normal….infectious….malignant. It makes me feel kind of like I’m a detective putting various clues together for a final resolution.”

Jamar is a graduate of Winston Salem State University with a Bachelor of Science degree in biology. After learning about the cytotechnology program affiliated with Central Piedmont Community College, he enrolled and began to move forward with his training in this ever changing field of diagnostic cellular interpretations. Jamar admits that he has encountered some long days of being in classes and performing the requirements of his clinical rotations, but looks forward to the reward of finding a job as a cytotechnologist in the very near future.

When Jamar was asked what he thought his contribution might be to the field of cytotechnology, he stated, “I would like to gain experience in diagnostic screening and move toward research within a company helping to improve diagnostic equipment, and to also have input on the development of advanced molecular devices and techniques.”

Cancer Cytology was happy to partner with Central Piedmont Community College for its second year of student internships here at the State Laboratory of Public Health. We wish Jamar the best of luck in his new career.

Submitted by:
Kim Wright, BS, CT (ASCP)
NCSLPH Cytology Unit
A Little Humor Goes a Long Way!

The mailroom at the North Carolina State Laboratory of Public Health is an extremely busy place. Each morning, mailroom employees sort and distribute thousands of specimens and documents. And of course, what comes in must go out, so afternoons are filled with preparing additional thousands of reports, supplies, and outgoing packages for distribution across the state.

Mailroom employee, Joe Oritz, decided to use a little humor to brighten the day for his co-workers. On September 19, Joe dressed in full pirate apparel and participated in Talk Like a Pirate Day at the local Krispy Kreme Doughnuts. After having no trouble qualifying as a bona fide pirate, Joe claimed his bounty of one dozen free doughnuts and headed to work to share with his co-workers! After receiving their sugar rush from the gooey, glazed treats, mailroom employees were reported to have worked especially fast that day. Kudos to Joe!

The State Laboratory welcomes the following new employees:

- **Newborn Screening** – Malasha Williams, Jennifer Slabaugh, Jared Clausen
- **Virology/Serology** – Michelle Charriez
- **Microbiology** – Liliana Arias, Candy Finsley
- **Operations** – Randall Wells
- **BT** – Christina Browne
- **Molecular Diagnostics** – Diana Sedano

Congratulations are extended to Cami Hartley of the Microbiology Unit on her retirement in October, 2014.
Sad, this is the last issue of “The Safety Corner.” I have accepted a position outside of the North Carolina State Laboratory of Public Health, so I will no longer write for Lab-Oratory. Laboratory safety has been one of my main focuses in my laboratory career. I have really enjoyed learning all about OSHA and finding ways to keep employees safe. I would like share the top things I have learned over the past twelve years.

It’s common sense! The majority of good lab practices are common sense. We are told, “No eating in the lab,” “No mouth pipetting,” and “Don’t forget to wash your hands.” All of these things we know not to do, but just have to remind ourselves of every now and then.

Accidents happen when complacency kicks in. Laboratorians should always have their guard up. Most accidents happen when the employee is distracted or just simply thinking, “I’ve done this for years…nothing bad will happen to me.” Always consider the safest way of doing a task, and never become complacent.

Safety is contagious. If you have a positive attitude about wearing personal protective equipment (PPE) and performing tasks safely, it will rub off on your co-workers. However, on the other hand, if you have a negative attitude and act like it’s silly to wear a lab coat, then your co-workers will follow your lead. Become the positive role model for others to imitate, and make being safe look cool!

Build a safety culture Speaking of setting a positive behavior, be contagious to the whole laboratory! Build a safety culture where employees are rewarded for wearing PPE, doing tasks safely and pointing out safety hazards. Make your employees want to be safe and it will become a way of life in your lab.

Stand up for yourself OSHA requires employers to supply all necessary PPE and safety equipment to employees. If you feel like you are asked to perform a task unsafely or you are not given the proper PPE, speak up!

Safety rules are not in place to torture employees OSHA is all about employee safety. Their regulations are in place to protect you, the laboratorian, from being harmed. Keep that in mind, and assure employees that these regulations are not concocted to make lab employees miserable.

Make safety training fun Safety training does not have to be boring! I have learned that exciting games and engaging activities help employees remember the information easily. Come up with fun ideas to quiz employees. Examples may include Jeopardy, Poker, Hollywood Squares, Survivor, or your favorite board game!

In the future, if you have any questions regarding safety please contact Kristy Osterhout at kristy.osterhout@dhhs.nc.gov or (919) 807-8755. I have really enjoyed answering your safety questions over the last twelve years and as always, “Stay Safe!”

Submitted by:
Kristy Main, BS
Laboratory Improvement Consultant
**Winter/Spring**

**Laboratory Improvement**
State Laboratory of Public Health
N.C. Department of Health and Human Services

**January-April**
2015 WORKSHOP SCHEDULE

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Disclaimer: These workshops are not intended to replace formal education but to enhance skills and promote use of recommended standard techniques.

For more information, consult our website or contact Lab Improvement at 919-733-7186
http://slph.ncpublichealth.com

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