

# Lab-Oratory

NC Department of Health and Human Services • State Laboratory of Public Health  
<http://slph.ncpublichealth.com>



WINTER & SPRING 2019

## From the Desk of the Director

Public-private partnerships are a collaboration between the public (government) and private (for-profit and non-profit) sector that enables achievement of common goals by overcoming obvious limitations. The need for such partnerships may surface for a variety of reasons, one of which is the inability for the public sector to provide necessary services on their own, in an efficient and effective manner, owing to lack of resources and/or management issues. While these partnerships are intended to create a potential for addressing difficult problems by leveraging the strengths of different partners, there are complexities that impede these relationships that bring together a variety of players with different and sometimes conflicting interests and objectives, working towards different and/or competing goals and within different governance structures.

The State Laboratory of Public Health (SLPH) has recently begun to explore opportunities for the development of partnerships with private entities, both non-profit and for-profit. As diagnostic technologies advance and our understanding and knowledge of health threats increases, there are advantages to partnering with experts from other sectors. One area of public health in which SLPH has chosen to focus is in newborn screening (NBS). Newborn screening is a state-based public health program designed to identify babies through laboratory screening who have critical health abnormalities that are not obvious at birth. Without screening for and identification of these conditions, babies would go home from the hospital without anyone having knowledge of the threat to their well-being. Days, months or even years could go by before a problem is detected, and it is usually even longer before the cause is known. Often the diagnosis occurs too late to prevent the most serious consequences of the disorder.

But NBS resides in an ever-changing environment due to advances in technology and treatments that present challenges to state NBS programs. Changes include 1) new technologies such as genome sequencing and other technological approaches to laboratory

diagnostics, 2) advances in basic science that continue to identify genes and other biomarkers associated with specific disorders, 3) drug development and treatments that will make previously untreatable conditions treatable, 4) the need to consider parent choice and preferences for information, and 5) patient advocacy groups that push for rapid expansion of screening to include new disorders. These challenges can be substantial; so how can public entities like SLPH prepare for a future in which NBS, as we know it today, is transformed?

I believe the solution will likely involve a collective and collaborative effort among many different stakeholders including government public health, academia, health care, industry, public policy makers, families and their advocates and others. Public-private partnerships will be essential if NBS is to evolve to meet the needs of its stakeholders. The SLPH has launched a partnership with researchers at RTI International and collaborators at the University of North Carolina at Chapel Hill, Duke University and Wake Forest Medical Center to conduct pilot studies for conditions recently added to the federally-recommended NBS panel including mucopolysaccharidosis Type 1 and X-linked adrenoleukodystrophy. Furthermore, this partnership has launched a state-wide research project – Early Check – to assess the feasibility of offering statewide voluntary screening for conditions that need further exploration to determine their suitability for traditional NBS. Early Check is a large-scale study made possible because academic, non-profit and government organizations have come together to build a statewide research infrastructure, leveraging the resources and talents of each partner.



**Scott J. Zimmerman, DrPH, MPH, HCLD (ABB) Laboratory Director**

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**FROM THE DESK OF THE DIRECTOR CONTINUED**

Our experience with this NBS collaborative will be a revealing look at the value of public-private partnerships to address public health issues. It could pave the path to a model that can be considered for other public health challenges. In the end, I believe that there is a need for a new public health

response and a paradigm shift that depends on partnerships to generate research and answers that will be useful for public health practice and policy and I look forward to reporting on our success with these new collaboratives and response efforts.

Submitted by: Dr. Scott J. Zimmerman, Director; NC State Laboratory of Public Health; NC Department of Health and Human Services

## SLPH Hurricane Relief Efforts

In preparation for the recent impact of Hurricane Florence, the Environmental Sciences Microbiology Lab and Certification Office staff, in conjunction with the State Laboratory (SLPH) mailroom, began preparing well water sample kits early in the week of September 10. Each kit consisted of a uniquely identified sample collection bottle, a submission form specifically designed for Hurricane Florence samples, and a mailing can for return shipment. Approximately 1,000 kits were prepared prior to arrival of the storm.

Sample kits were requested by county emergency management staff through the State Emergency Operations Center. The first requests were received on Sunday, September 16, two days after landfall. As of November 15, a total of 2,190 kits have been forwarded to 25 counties.

Twenty-three counties have returned a total of 1,026 samples. Of these, over 140 are from sites that have been sampled multiple times. Many locations still have not achieved a sample free of both total coliform and *E. coli* bacteria, the Environmental Protection Agency standard for microbiological quality of potable water.

As expected, following flooding of this nature, the overall results for these samples show a higher level of contamination than routine well water samples. From January-September preceding Hurricane Florence, 73.7 percent of the private well samples tested were absent of both total coliform and *E. coli*, 24.2 percent had total coliform present but no *E. coli*, and 2 percent indicated the presence of both total coliform and *E. coli*. For the hurricane samples, 55.9 percent were absent for



**Flooding from a hurricane greatly impacts well water quality.**

both, 31.0 percent positive for total coliform but absent for *E. coli*, and 13.1 percent positive for both.

The Environmental Microbiology Laboratory continues to test samples in response to the flooding associated with Hurricane Florence. Historically, laboratory testing has continued for six to seven months following landfall while environmental health staff work with homeowners to achieve acceptable water quality.

Other hurricane relief efforts at SLPH include those of the Newborn Screening (NBS) Unit whose leadership formulated a Continuity of Operations Plan (COOP) to ensure all staff had information and resources ready in case of emergency and disruption of operations. As a result of these efforts, the unit developed their own incident command center to document all activities of the lab amongst staff. Thorough

coordination of clerical, follow-up and NBS staff ensured all critical results were reported properly and in a timely manner. The unit stayed in constant communication with UPS in tracking samples to be delivered to SLPH. Another very important part of the plan encompassed NBS leadership having an agreement with a backup laboratory in case operations at SLPH were halted.

Staff at SLPH have always pulled together to ensure that services continue to be provided in the best way possible when disasters occur, and Hurricane Florence was no exception. With lessons learned from this recent event, SLPH will continue to explore ways to ensure that hurricanes and other disruptive events do not adversely affect laboratory operations.

Submitted by: Marion Alston, Business Services Coordinator, NC SLPH

## The Chemical Terrorism and Threat Unit: 2018 – The Year of Collaborations

In 2018 the Chemical Terrorism and Threat Unit (CTAT) at the North Carolina State Laboratory of Public Health (NCSLPH) worked collaboratively with several partnering agencies to identify and characterize hazardous chemical exposures in several unique and interesting cases in North Carolina. The year started with a call from an attending physician at a local hospital in Cumberland County that was requesting analytical services to determine if a patient was suffering from ricin intoxication. The CTAT Unit provided instructions for specimen collection and courier services to have blood and urine sent to the laboratory for emergency analysis. Upon receipt, the specimens were immediately analyzed for the presence of ricinine, a biomarker associated with ricin exposure.

When ricinine was detected the investigation focused on identifying the potential source of exposure. Law enforcement and the Cumberland County Health Department worked collaboratively to collect environmental samples from the patient's home to identify the source of exposure and to ensure that other family members were not at risk for ricin intoxication. The CTAT Unit then worked with the BTEP (Bioterrorism and Emerging Pathogens) Unit to test the samples for the presence of ricin toxin and ricinine. Neither the toxin nor the biomarker was detected in the samples. Further investigation of the home revealed that castor beans (the plant material from which ricin/ricinine is obtained) had recently been purchased; however, the beans were never recovered from the home. Castor beans were the likely source of the ricin exposure.

The CTAT Unit has also worked collaboratively with the North Carolina Office of the Chief Medical Examiner (NC OCME) and the Wisconsin State Laboratory of Hygiene (WSLH) to investigate cases of coagulopathy involving the use of synthetic cannabinoids adulterated with rodenticides, specifically Brodifacoum. Since April 2018,



Photo of castor beans, the plant material from which ricin/ricinine is obtained.

North Carolina has identified seven cases, including one fatality.

The cases presented to local emergency departments with hemorrhaging and elevated international normalized ratios (INRs) suggesting stimulation of the extrinsic pathway for coagulation. Patient interviews by either local law enforcement or emergency department nurses revealed the use of over-the-counter products that contain synthetic cannabinoids.

In one case, remnants of the product consumed were obtained from the patient and provided to the Toxicology Laboratory in the NC OCME. This allowed for the detection of synthetic cannabinoids by GC-MS analysis. Clinical specimens were collected from several patients and were sent to the WSLH for Brodifacoum analysis. Specimens from the one decedent, an inmate within a local state prison, are awaiting toxicology testing at the NC OCME. As well, the CTAT Unit and other partners (NC Poison Control Center, North Carolina Occupational and Environmental Epidemiology, and the CDC) have actively participated in weekly conference calls concerning the nationwide epidemic of coagulopathies associated with synthetic cannabinoid use.

Lastly, in early June of 2018, the CTAT Unit was contacted by the Fayetteville Police Department concerning a possible adulteration of pizza cheese at a local restaurant. An individual was seen on camera putting unidentified pellets into the pizza cheese after normal business hours.

A rodenticide was suspected due to the physical appearance of the pellets. The CTAT Unit contacted the NC Department of Agriculture to obtain standards that would allow for analysis of suspicious substances to detect rodenticides. In addition, the CTAT Unit purchased multiple commercially available rodenticides to use as testing controls. Working collaboratively with the NC Department of Agriculture, the group developed a testing plan to evaluate the pellets found in the cheese. It was determined that the evidence retrieved from the restaurant was an "all-natural" product called RAT X, which contains no chemical rodenticides. Regardless; the suspect, an employee of the restaurant, confessed to the crime and has been prosecuted.

The beauty of these symbiotic collaborations is that they allowed for a rapid response to unusual situations that may have endangered the health of North Carolina citizens and allowed for the sharing of technological knowledge that facilitated informed decision making. Additionally, as the need for future analysis arises, subject matter experts can more quickly be brought together to craft strategies that use a variety of technologies and methodologies found in discrete programs that share a common goal of protecting the health and well-being of all North Carolinians.

Stay tuned ....

Submitted by: **Kate Koehler,**  
CTAT Unit Manager



## Wake Tech Students Get a Glimpse into Public Health

Today's laboratory workers have numerous options when they graduate from their respective programs. Hospitals remain popular places of employment as well as reference labs and research facilities. An often-overlooked area is the field of public health. The Medical Laboratory Technology (MLT) program at Wake Technical Community College in Raleigh offers students a glimpse into this growing field through a partnership with the North Carolina State Laboratory of Public Health (NCSLPH). Graduates of this program obtain an Associate in Applied Science (AAS) degree and are eligible to take the examination given by the Board of Certification of the American Society for Clinical Pathology (ASCP).

Pam Horton, Director of the MLT Program, emphasized the importance of this partnership by stating the following, "WakeTech's MLT program and the NC State Lab of Public Health have a long history of collaboration to educate and provide clinical rotations for future MLT students. The students become aware of the importance and role of public health services and career opportunities. Through the years, the State Lab has hired many WakeTech graduates who then go on to serve as preceptors for new classes. In addition to traditional medical lab experiences, students see the many special services offered by the State Lab. Studying emerging technologies at the State Lab provides invaluable learning opportunities."

This partnership began over 30 years ago when the college added NCSLPH to their list of clinical rotations, offering students a chance to shadow lab employees and observe testing. For many years, students focused on the State Lab's more common, high volume testing for sexually transmitted diseases such as rubella, hepatitis, HIV and tuberculosis. With the increase in specialized testing to address more recent public health issues, many other areas have now been added to the rotations.

Fourteen second-year students completed rotations through clinical areas at NCSLPH from August – December 2018. Staff agreed that in addition to routinely observed areas, the Lab performs many other

testing services that students would find interesting. A schedule was compiled to include additional experiences and give the students exposure to a much broader range of programs and services. One of the first areas the students visited was the Central Accessioning area where large volumes of specimens are sorted, processed and assigned unique numbers before being transported to the testing areas. On another day, Lab Improvement staff conducted a condensed hands-on microscopy class to further the students' skills in the use and care of microscopes. Members of the Bioterrorism and Emerging Pathogens Unit also hosted a mini-workshop to provide students with information on testing for bioterrorism and chemical threats.

While in the serology labs, students observed and participated in testing methodologies such as IFA, EIA and NAAT. Staff from the Microbiology Unit assisted students in learning about tuberculosis testing, mycology and parasitology. In the blood lead lab, students participated in analyzing instrument quality control and preparing calibration curves. Visits were also made to the rabies lab, Newborn Screening Unit, and Molecular Epidemiology Unit where overviews of the provided services were given to help the students understand the effect of these programs on the health of North Carolina citizens.

Students rotate through the different lab areas in groups of 3-4, allowing preceptors a better opportunity to get to know the students and their interests, and to make it easier for everyone to participate in hands-

on activities. Lab staff have enjoyed sharing their knowledge with the students and appreciate their enthusiasm and desire to learn. Student Laura Litecki summarized her experience by stating, "I thought everything at the NCSLPH rotation was organized well, and instructors were engaging and encouraging. I enjoyed seeing all the serology and virology testing that they perform." Another student, Ibrahim Tawdros reported, "My rotation at the NCSLPH was excellent. I was able to improve my skills in all lab departments."

This partnership is definitely beneficial for both organizations. Medical Technology Instructor Mattie Goodson stated, "Our students are so fortunate to have the opportunity to spend time at the North Carolina State Lab of Public Health. During their 50 clinical contact hours, they get to see everything from newborn screening and serology testing to parasitology and bioterrorism testing. Because of this experience, concepts and theory we talk about on-campus really come to life for the students. I'm proud of the partnership between Wake Technical Community College and the NCSLPH."

As for the State Lab, each student is viewed as a prospective employee and the Lab as a potential employer. We look forward to many more years of collaboration resulting in this valuable and unique opportunity to provide a glimpse of laboratory medicine in the field of public health!

Submitted by: **Patty Atwood, Laboratory Improvement Coordinator**



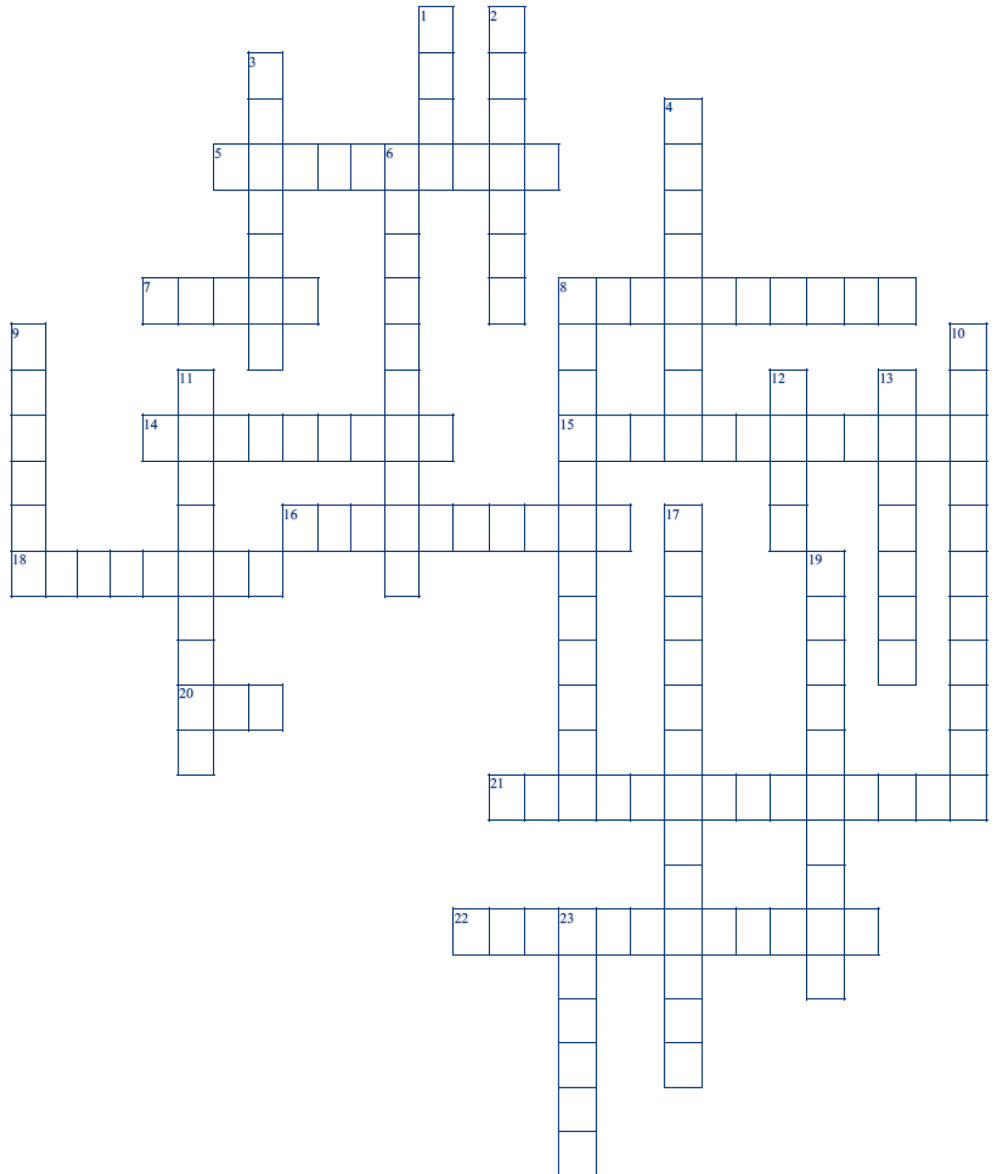
Students participate in hands-on activities in the bioterrorism and chemical threat workshop.

# Biosafety Corner

Most of us know that biosafety is the application of knowledge, techniques and equipment to prevent personal, laboratory and environmental exposure to potentially infectious agents or biohazards. But here's a chance to test your knowledge of terms common to biosafety and risk assessment. Many answers can be found in the [BioRisk Assessment and Risk Mitigation Protocol and Worksheet](#) in the Biosafety section of the SLPH website. This document was designed to give laboratorians in NC a template and guidance for performing risk assessments of infectious agents encountered in their laboratories. Good luck and have fun!

## Across

4. Shorter way to say hazardous biological materials
5. Broken glass, needle, or another object that may cause a cut or puncture
7. Personal protective equipment that protect hands from hazardous materials
9. Location where biological or chemical work is performed.
12. How a pathogen is passed from one host to the next
17. Terrorist activity involving the intentional release of biological agents
18. Period of time between exposure and when the first signs and symptoms appear
19. Techniques and equipment to prevent personal, laboratory and environmental exposure to biohazards
20. The first word in the new risk assessment template
21. Biological agent that causes disease or illness to its host
22. Most important part of biological risk management; informs about risks and mitigations
23. Containment measure which reduces laboratorian exposure risk to biohazards; e.g. a biosafety cabinet
24. Another word that describes the possibility of a an even occurring; used in the risk matrix



## Down

1. Pathogen transmitted via contact with infected blood
2. First word in SOP
3. Mode of transmission that involves breathing in infectious agent
6. Color most often used to indicate biohazardous materials
8. Control measure that replaces a hazard with a less hazardous option
10. Control measure which changes the way people work using signs, procedures and training to make the workplace safer.
11. Calculated as probability of occurrence x severity of effects associated with a specific procedure or pathogen
13. Another word for outcome when assessing risk
14. Way to decrease risk by implementing effective control measures
15. According to the risk matrix, this consequence involves fatality or injury or illness with permanent disability
16. Estimated risk level where you are advised to put controls in place before undertaking activity.

Submitted by: Kristin Long, NCSLPH Biosafety Officer

# New Additions, Retirements and Kudos!

## New Employees

The North Carolina State Laboratory of Public Health (NCSLPH) is excited to welcome the following employees, and we wish them well in their service with us:

- **Central Accessioning** – Vanessa Gaspard, Eric Umstead, Keith Partlow
- **Operations** – Ray Hunting, Sharon Beadnell, Janice Long, John Noonan
- **Molecular Epidemiology** – Marcia Sanders
- **Newborn Screening** – Elena Neill, Priscilla Busha
- **Microbiology** – Nusheen Syeda, Brandon Skinner, Rebecca Wall, Monica Jarvis
- **Virology/Serolog** – Robin Bridges, Christina Heckman, Amorie Parker

## June – December 2018 Retirees

2018 has been the year of the retiree! We are saddened to see so many of our seasoned employees leave, but we congratulate them on their retirement and wish them many years of enjoyment in their activities!

**Kristy Osterhout** retired June 1 after approximately 30 years at the State Lab. Kristy worked in several different areas of the lab including Laboratory Improvement and as the Safety Officer. She plans to travel and visit with family in Florida during her retirement. She also plans to continue to be active with her hula group!

**Dr. Lou Turner** retired June 30 after 35 years and six months at NCSLPH. Dr. Turner served in many roles during her time in public health. Her last position was as the section chief of the Office of the Chief Medical Examiner and State Lab of Public Health. Dr. Turner plans to travel, work in her garden and do volunteer work at the elementary and middle school level. She is excited to be helping her daughter plan her wedding in the spring of 2019. She would also like to do some consulting work part time to “keep her brain engaged”

**Myra Brinson**, Virology/Serology Manager, retired July 1 after 20 years of state service. Myra worked at NCSLPH

for 17 years and six months. She and her husband moved to eastern North Carolina where Myra is looking forward to “coastal living” during her retirement.

**Regina Lee** retired August 1 after 30 years of state service. She worked at NCSLPH for 29 of those years, spending most of her time in the Virology/Serology Unit. Regina plans to take it easy and enjoy life, whatever the day may bring.

**Mavis Cooley** retired August 1 after 37 years at NCSLPH. Mavis started in Newborn Screening, then moved to Hemachemistry where she spent most of her career. She plans to reconnect with family and work on her spiritual foundation during retirement. She is looking forward to not having to wake up at four o'clock every morning!

**Roger Brown**, Radiochemistry Supervisor, retired September 1 after working for the state for 22 years. He worked at the NCSLPH for 19 years. Roger plans to travel, fish, visit friends and family and eventually get a part-time job during his retirement.

**Donna Goodmond** retired September 29 after 18 years and 4 months working as a Business Services Coordinator at NCSLPH. Prior to her state service, Donna retired from the United States Air Force after 21 years of service. She plans to travel, teach and spread joy and unity throughout the community as she takes time to “smell the roses” during her retirement.

**Mark Minzer** retired October 1 after 33 years of state service. Mark worked for 32 years at NCSLPH in the maintenance department. He plans to spend time with his family during retirement.

**Angela Minzer** retired October 31 after working 26 years in the NCSLPH mailroom. She plans to spend time traveling, visiting family and “just doing what I want to do.”

**Ann Grush** retired November 1 after 38 years at NCSLPH. Ann worked in Newborn Screening, starting as a bench tech, then receiving a promotion to supervisor, and finally serving as a consultant for the program. Ann plans to just enjoy retirement.

**Debbie Moncol** retired December 31 after 34 years at NCSLPH. Debbie worked in inorganic chemistry, organic chemistry, laboratory certification and was the inorganic chemistry supervisor upon her retirement. Debbie plans to travel, spend time with her family and grandchildren and volunteer in her church.

**Darneice Owens** retired December 31 after 21 years and 6 months at NCSLPH. Darneice worked in Virology/Serology, Cancer Cytology and Environmental Sciences. She plans on taking life one day at a time, spending quality time with her mother and traveling with her husband in their RV. She also plans to spend time on the lake on her pontoon boat.

**Denise Griffin** retired December 31 after 33 years and 4 months with the state. She worked at NCSLPH for almost 28 years. Denise began her career in the Virology Unit, moved on to Lab Improvement, and spent her last years of service in the Molecular Epidemiology Unit. She plans to work full-time as a generalist at a local hospital during her retirement years.

## Kudos to our Employees of the Quarter for outstanding service and contributions!

**Alvin Liao** was recognized during Quarter 2 of 2018 for his service excellence in the tandem mass spectrometry laboratory in the Newborn Screening Unit. He has consistently worked above and beyond to meet turnaround time goals. He has received excellent feedback from physicians and other external customers who appreciate his hard work and dedication in providing services to our newest North Carolinians. Thank you, Alvin!

**Tom Lawson**, Microbiology Unit Manager, was the recipient of the Quarter 3 Employee of the Quarter award. Tom was recognized for his excellent leadership in the Microbiology Unit. He has assumed additional responsibilities in guiding staff in the absence of two supervisors. Despite this hardship, he has taken great effort in supporting his team with making decisions and promoting their development. His team appreciates his



**NEW ADDITIONS, RETIREMENTS AND KUDOS! CONTINUED**

efforts in improving morale inside and outside the unit. Thank you, Tom!

**Haitham Dawuid** is being recognized during Quarter 4 for the excellent customer service he provides to all units who need IT assistance. He was nominated by several employees for his friendly manner and his promptness and efficiency in providing IT support to those who need it. He has been instrumental in solving a myriad of IT-related issues since he started working at SLPH in January 2018. Thank you, Haitham!



Employee of the Quarter recipients Tom Lawson, Microbiology Unit Manager, and Haitham Dawuid, Technology Support Technician (not pictured – Alvin Liao, Newborn Screening)

Compiled by: Angie Bradley,  
Lab Improvement



*Winter/Spring 2019*  
**LABORATORY IMPROVEMENT**

**February – June 2019 Workshop Schedule**

Feb. 27-28, 2019	Laboratory Methods in the Diagnosis of Gonorrhea	Jan. 28, 2019
March 12, 2019	2019 Packaging and Shipping Regulations	Feb. 12, 2019
March 5-8, 2019	Process Control Chemistry	Feb. 8, 2019
April 4, 2019	Bioterrorism Preparedness for Clinical Laboratories	March 4, 2019
April 10, 2019	Microscopy: Viewing and Reviewing	March 10, 2019
April 11, 2019	Examination of a Vaginal Wet Mount	March 11, 2019
April 25, 2019	2019 Packaging and Shipping Regulations	March 25, 2019
May 21, 2019	2019 Packaging and Shipping Regulations	April 21, 2019
May 23, 2019	2019 Packaging and Shipping Regulations	April 23, 2019
June 20, 2019	Evaluation of a Stat Male Smear	May 20, 2019
June 25, 2019	2019 Packaging and Shipping Regulations	May 25, 2019

*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 or <http://slph.ncpublichealth.com>.*

**MISSION STATEMENT**

The State Laboratory of Public Health provides certain medical and environmental laboratory services (testing, consultation and training) to public and private health provider organizations responsible for the promotion, protection and assurance of the health of North Carolina citizens.

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- Steven Bowen**, Virology/Serology
- Robbie Hall and Nichole Page**, Molecular
- Vacant**, CTAT/Blood Lead
- Vacant**, Microbiology



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