

# Lab-Oratory

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



WINTER 2019 & SPRING 2020

## “A View from the Corner Office”

“Change does not necessarily assure progress, but progress implacably requires change,” is a profound sentiment credited to historian Henry Steele Commager. The North Carolina State Laboratory of Public Health (NCSLPH) has experienced several recent leadership and technical changes with a few more on the horizon. As the new Director for the NCSLPH, I am excited to join a talented team of administrative and scientific leaders and work together to translate these changes into enduring progress.

The pace and path to effect change face certain obstacles in many government organizations. Having spent more than 12 years at the New Jersey Public Health and Environmental Laboratories, I understand the potential challenges to seizing the opportunities that change presents. However, public health is a constantly evolving field, and the state laboratory must adapt. Advancing our work in the provision of critical medical and environmental testing services requires preparedness, creativity, and partnerships.

My family and I moved to North Carolina a little more than two years ago and have come to adore our new

home state. From the shore to the mountains, the volume and diversity of personal activities and professional opportunities are amazing. In my short time with NCSLPH, I have discovered a similar level of variety in the interests and training of our laboratory team and our internal and external partners.

The NCSLPH Lab-Oratory newsletter is an excellent venue to share more about this personal and professional diversity while highlighting the work we perform. This issue includes several examples of the team’s recent progress in the face of the multitude of changes. While I will ultimately share my views from my corner office on District Drive about a topic or two that I hope you will also find interesting, for my first article as Director, I would simply like to draw attention to some of the great stories in this issue of Lab-Oratory.

In the last few months, the NCSLPH has joined the broader public health laboratory community in recognizing Medical Mycology and Fungal Awareness Month (MMFAM) and World Rabies Day. For MMFAM, Microbiology Unit Manager, Tom Lawson, shared a fascinating presentation during the NCSLPH Program Update webinar. Did you attend? If not,



Scott M. Shone, PhD, HCLD(ABB)

you missed a wonderful discussion on existing and emerging fungal pathogen threats, but don’t worry as Tom recaps important MMFAM lessons in this issue. Additionally, our activities for World Rabies Day, which included a variety of educational presentations about the virus, the spread of the disease, the impact on public health, and new research on trying to fight the virus in the racoon population are chronicled by Sara D’Arcy, a member of our Virology Unit.

On a beautiful Friday in early October, the Laboratory Improvement (LI) team hosted the NCSLPH 15th annual Clinical

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# The Chemical Terrorism and Threat Unit: Vaping-Associated Lung Injury

In 2019 the Chemical Terrorism and Threat (CTAT) Unit at the North Carolina State Laboratory of Public Health (NCSLPH) worked collaboratively with the Division of Public Health Epidemiology Branch in response to the e-cigarette or vaping product use associated lung injury epidemic (EVALI) formerly known as vaping-associated pulmonary injury (VAPI). As of November 6, 2019, North Carolina has had 69 cases. Nationally, as of November 13, 2019, 2,172 lung injury cases associated with the use of e-cigarette, or vaping, products have been reported to CDC from 49 states (all except Alaska), the District of Columbia, and 1 U.S. territory. Forty-two deaths have been confirmed in 24 states. Patients who met the CDC case definition of EVALI were identified by the NC Epidemiology Branch through health care providers. Patient interviews were conducted and requests for patient vaping products yielded submissions to the NCSLPH CTAT Unit for non-targeted Gas Chromatograph-Mass Spectrometry (GC-MS) analysis as well as heavy metals analysis by Inductively Coupled Plasma Mass Spectrometry (ICP-MS).

The NCSLPH received 99 vaping products from 10 patients, of which 82 were analyzed for both non-targeted GC-MS



Examples of products obtained from North Carolina patients.

## LABORATORY RESULTS OF PRODUCTS SUBMITTED BY CASE-PATIENTS IN VAPING ASSOCIATED LUNG ILLNESS INVESTIGATION

GC Results	Products N=82 (%)	Patients N=10 (%)
(%)THC, Cannabidiol, Cannabinol	74 (90)	10 (100)
Vitamin E acetate	54 (66)	9 (90)
Terpenes	54 (66)	7 (70)
Glycerol	17 (21)	5 (50)
Nicotine	7 (9)	2 (20)
Menthol	5 (6)	1 (10)

*N (%) unless otherwise specified.*

and heavy metals. Most notably; Tetrahydrocannabinol (THC), Cannabidiol and Cannabinol (compounds found in the cannabis plant) were found in 74 of the 82 products. Other compounds found in the analysis include: Vitamin E acetate, Terpenes, Glycerol, Nicotine and Menthol. Heavy metals analysis, by ICP-MS, of the 82 products yielded the presence of Barium, Lead and Cadmium.

The year 2019 has seen the emergence of vaping-associated pulmonary injury (VAPI) as reports of morbidity and mortality continue to rise throughout the United States. Even though the cause or causes of VAPI remain unclear, physicians must consider vaping behavior in everyday patient care.

“Vaping” refers to the heat-induced aerosolization of a liquid using a battery-powered device. The rise of vaping as a public health phenomenon and the emergence of VAPI coincide with the decreasing social acceptance of cigarette smoking coupled with the legalization of medical and recreational cannabis. Despite insufficient evidence, nicotine vaping has been marketed as a healthier alternative to smoking and has been promoted as a means to assist in smoking cessation. Children and adolescents are also targeted through flavorings that appeal to a younger market and via social media promotion. The resulting increase in

popularity of nicotine vaping has helped to grow a vaping constituency in the cannabis industry and extend the use of vaping technology for illicit substances (1).

Many patients present initially in the outpatient setting with gastrointestinal symptoms, including nausea, vomiting, and diarrhea; constitutional symptoms, such as fever and malaise; and/or respiratory symptoms, such as shortness of breath, cough, or pleuritic chest pain. Patients develop infiltrates on plain film or ground-glass opacities on computed tomography along with hypoxia and an elevated leukocyte count in the absence of an identifiable infectious source. Pulmonary manifestations progress rapidly in many patients, requiring hospitalization, intensive care, and mechanical ventilatory support (2). A wide range of pneumonitis patterns have been described, including acute eosinophilic pneumonia, organizing pneumonia, lipid pneumonia, diffuse alveolar hemorrhage, and hypersensitivity pneumonitis (3).

The cause or causes of VAPI remain unknown. It might be attributable to intrinsic properties of the substances being vaped or contamination thereof. Vaping solutions may contain nicotine; cannabis compounds, including the psychoactive tetrahydrocannabinol and non-psychoactive, such as cannabidiol;

**APHL CONFERENCE OFFERS SOMETHING FOR ALL! CONTINUED**

and pharmacologically inactive substances, such as flavoring compounds. The delivery devices themselves, sometimes referred to as “vapes,” “vape pens,” “e-cigarettes,” or “JUULs,” are varied and may be manipulated. The absence of vaping regulations and significant variation among manufacturers and delivery mechanisms complicate the study of causality.

The primary constituents of nicotine vaporizing liquid are nicotine; diluents, such as propylene glycol and vegetable glycerin; and flavoring compounds. Some e-cigarettes replace diluents with an organic acid mixture that creates nicotine salts, a less abrasive inhalation agent that allows for much higher concentrations of nicotine that can be absorbed more readily (4).

The latest national and state findings suggest products containing THC, particularly those obtained off the street or from other informal sources, are linked to most of the cases and play a major role in the outbreak.

CDC is offering additional laboratory testing. CDC is currently validating targeted methods to test chemicals in bronchoalveolar lavage (BAL) fluid, blood, or urine and has received initial samples. CDC is testing pathologic specimens, including lung biopsy or autopsy specimens, associated with patients. CDC is also validating methods for aerosol emission testing of case-associated product samples from e-cigarette, or vaping, products and e-liquids. Initial data from product sample testing has guided the need for these additional assays. Results may provide insight into the nature of the chemical exposure(s) contributing to this outbreak.

As of November 14, 2019, CDC has identified vitamin E acetate as a chemical of concern among people with e-cigarette, or vaping, product use associated lung injury (EVALI). Recent CDC laboratory testing of bronchoalveolar lavage (BAL) fluid samples (fluid samples collected from the lungs) from 29 patients with EVALI

submitted to CDC from 10 states found vitamin E acetate in all of the samples. Vitamin E acetate might be used as an additive, most notably as a thickening agent in THC-containing e-cigarette, or vaping, products. THC was identified in 82% of the samples and nicotine was identified in 62% of the samples.

Link to the CDC website on Outbreak of Lung Injury Associated with E-Cigarette Use, or Vaping: [https://www.cdc.gov/tobacco/basic\\_information/e-cigarettes/severe-lung-disease.html](https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease.html)

Link to APHL website on Lung Injury Response Associated with Vaping: [https://www.aphl.org/programs/environmental\\_health/Pages/Lung-Injury-Response-Associated-with-Vaping-.aspx](https://www.aphl.org/programs/environmental_health/Pages/Lung-Injury-Response-Associated-with-Vaping-.aspx)

**REFERENCES**

1. Breitbarth AK, Morgan J, Jones AL. E-cigarettes—an unintended illicit drug delivery system. *Drug Alcohol Depend.* 2018;192:98-111. [PMID: 30245461] doi:10.1016/j.drugalcdep.2018.07.031
2. Schier JG, Meiman JG, Layden J, et al; CDC 2019 Lung Injury Response Group. Severe pulmonary disease associated with electronic-cigarette-product use - interim guidance. *MMWR Morb Mortal Wkly Rep.* 2019;68:787-90. [PMID: 31513561] doi:10.15585/mmwr.mm6836e2
3. Henry TS, Kanne JP, Kligerman SJ. Imaging of vaping-associated lung disease [Letter]. *N Engl J Med.* 2019. [PMID: 31491070] doi:10.1056/NEJMc1911995
4. National Academies of Sciences, Engineering, and Medicine. *Public Health Consequences of E-Cigarettes.* Washington, DC: National Academies Pr; 2018.

Submitted by Kate Koehler  
CTAT Unit Manager

**“A VIEW FROM THE CORNER OFFICE”  
CONTINUED**

Laboratory Day in Raleigh. In this issue of Lab-Oratory, the LI team summarizes this wonderful educational and networking experience. The conference focus was partnerships and their critical role in the public health laboratory community with examples from a recent foodborne outbreak, the response to a potential outbreak of HIV, and antibiotic resistant *E. coli* in a healthcare setting. I hope to see you at next year’s 16th annual Clinical Laboratory Day.

Highlighting the importance of public health emergency preparedness at NCSLPH, the laboratory’s Chemical Terrorism and Threat (CTAT) team has been busy as part of a broad DHHS response to the ongoing vaping epidemic. Our CTAT coordinator, Kate Kohler, shares her team’s efforts to partner with local health to help keep our citizens safe, establish new methods to detect contaminants in vape products, and coordinate with the Food and Drug Administration on the federal government’s response to this national public health problem.

Finally, in this issue, please take a few moments to read about the NCSLPH flu surveillance activities (yes, it’s back again this year!), our recent whole genome sequencing award, our team member’s individual kudos, and acquaint yourself with the laboratory’s new Industrial Hygiene Consultant and Safety Officer, Anna Liddicoat. Anna is another new addition to the NCSLPH team and brings a fresh view to our facility’s safety operations.

It is an honor to join the NCSLPH and I look forward to our progress as we enhance and strengthen our laboratory community.

Submitted by  
Scott M. Shone, PhD, HCLD(ABB)  
Director, NCSLPH



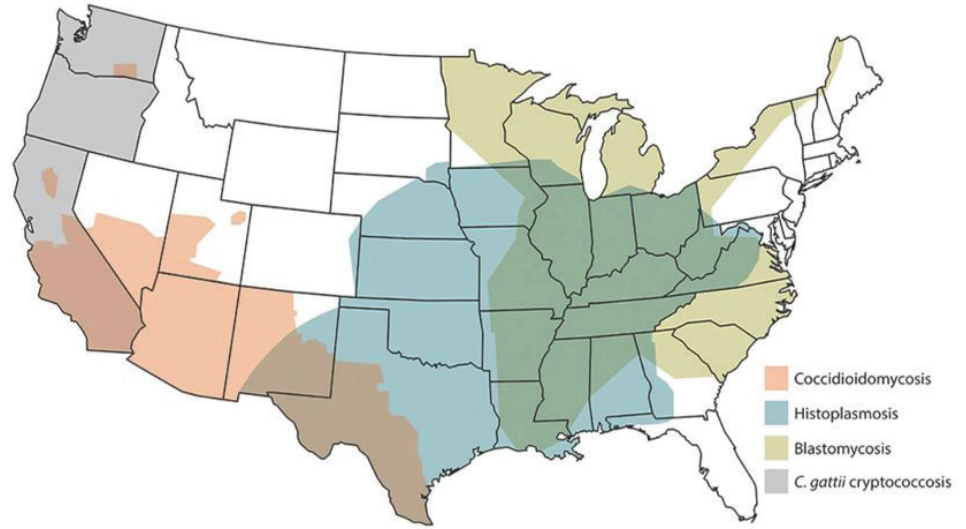
# Think Fungus! The Impact of Fungal Pathogens on Public Health

In recognition of 2019 “Fungal Disease Awareness Week” held September 23rd-27th, CDC and partners organized to highlight the importance of recognizing serious fungal diseases early enough in the course of a patient’s illness to provide life-saving treatment. Because fungal disease symptoms can mimic symptoms of more common infectious diseases (e.g. influenzae and pneumonia) fungal diseases are widely under-recognized and misdiagnosed and can cause devastating illness, even in previously healthy people. It’s estimated the fungal diseases cost the U.S. healthcare system in excess of 7 billion dollars annually, though this estimate is probably conservative given widespread misdiagnosis and unrepresentative medical coding associated with these illnesses.

As part of the 2019 Fungal Disease Awareness Campaign, CDC encourages healthcare providers and their patients to “Think Fungus” when symptoms of suspect bacterial infections do not improve with conventional antibiotic treatment. Early and accurate diagnosis of fungal diseases can lead to optimized targeted treatment. This year, CDC is focusing on three fungal diseases that can feel like the flu or pneumonia: **Valley fever (coccidioidomycosis)**, **histoplasmosis**, and **blastomycosis**. These diseases represent examples of “endemic mycosis” – fungal diseases caused by a heterogenous group of fungi that occupy specific ecological niches in the environment and thus have circumscribed geographic ranges (see Figure 1). These three diseases are also caused by a class of fungal agents known as “dimorphic fungi” - fungi that can exist in the form of both mold and yeast brought about by changes in temperature.

**Blastomycosis** is an infection caused by a fungus called *Blastomyces*. The fungus lives in the environment, particularly in moist soil and in decomposing matter such as wood and leaves. Blastomycosis is endemic in regions of North America that border the Great Lakes and the St. Lawrence River, as well as in the Mississippi River and Ohio River basins. The NCSLPH Mycotics Unit identifies multiple blastomycosis in North

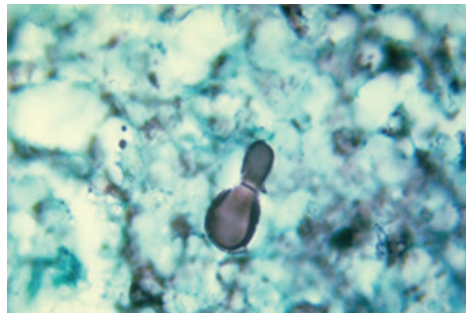
Figure 1: Geographic distribution of endemic fungal infections in the United States



From CDC <https://www.cdc.gov/nceid/dfwed/PDFs/fungal-factsheet-508c.pdf>

Carolina residents annually. People can get blastomycosis after breathing in the microscopic fungal spores from the air. Although most people who breathe in the spores don’t get sick, some of those who do may have flu-like symptoms, and the infection can sometimes become serious if it is not treated.

Photomicrograph showing the environmental form of *Blastomyces*

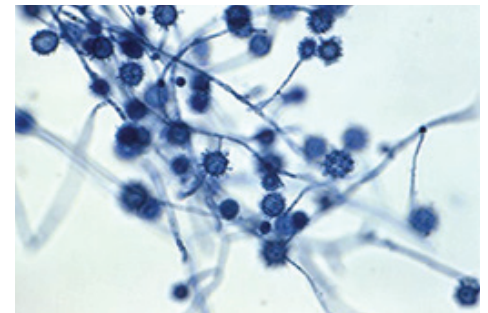


From CDC <https://www.cdc.gov/fungal/diseases/blastomycosis/index.html>

**Histoplasmosis** is an infection caused by a fungus called *Histoplasma*. The fungus lives in the environment, particularly in soil that contains large amounts of bird or bat droppings. Histoplasmosis is most commonly transmitted when these spores become airborne, often during cleanup or

demolition projects. In the United States, *Histoplasma* mainly exists in the central and eastern states, especially areas around the Ohio and Mississippi River valleys. Although most people who breathe in the spores don’t get sick, those who do may have a fever, cough, and fatigue. For infants and those with compromised immune systems – histoplasmosis can be serious. North Carolina’s endemic bat population contributes to the number of Histoplasmosis cases commonly identified by the NCSLPH Mycotics laboratory.

Photomicrograph showing the environmental form of *Histoplasma*

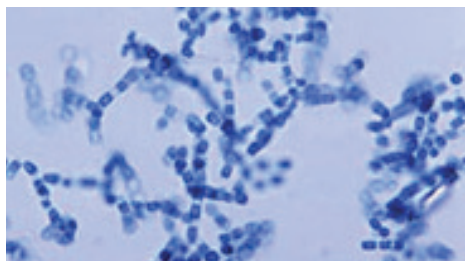


From CDC <https://www.cdc.gov/fungal/diseases/histoplasmosis/definition.html>

**THINK FUNGUS! THE IMPACT OF FUNGAL PATHOGENS ON PUBLIC HEALTH CONTINUED**

**Valley fever**, also called **coccidioidomycosis**, is an infection caused by the fungus *Coccidioides*. The fungus is known to live in the soil in the southwestern United States and parts of Mexico and Central and South America. Though not endemic to North Carolina, the NCSLPH Mycotics laboratory has identified multiple cases of coccidioidomycosis in North Carolina residents with travel history. Anyone who breathes in the fungus can become infected, but Valley fever is most common in adults over age 60 and high-risk groups (e.g. HIV/AIDS patients, pregnant, diabetic). People who have recently traveled or moved to an area where the fungus lives may be more likely to get the infection.

Photomicrograph showing arthroconidia of *Coccidioides* (environmental form)



From CDC <https://www.cdc.gov/fungal/diseases/coccidioidomycosis/definition.html>

The NCSLPH Mycotics Unit maintains technical training for three laboratorians to conduct isolation and identification of medically important fungi, including endemic mycoses. Each laboratorian has attended the CDC/APHL "Laboratory Identification of Emerging Pathogenic

Mold" workshop and continuously explores enhanced training opportunities for this highly nuanced technical bench. The SLPH Mycotics laboratory utilizes a combination of diagnostic platforms including morphologic identification on selective media, MALDI-TOF and 16S sequencing to identify and characterize a variety of molds, yeasts, and *actinomycetes* (*Nocardia*). Future directions for the NCSLPH Mycotics laboratory include in-house identification of highly pathogenic *Candida auris*, development of whole genome sequence (WGS) typing tools for fungal outbreak investigations, and program development of antifungal resistance among *Candida*/yeast species.

Submitted by Tom Lawson  
Microbiology Unit Manager

## Collaboration Pays Off for Proposal Team!

Congratulations to our 2019 Team of the Year (TB Team) and the Molecular Diagnostic & Molecular Epidemiology Unit for their outstanding collaborative work on the APHL-CDC Proposal for "Whole Genome Sequencing (WGS) of *Mycobacterium tuberculosis* complex (MTBC) Positive Primary MGIT Cultures." The proposal received a perfect score of 100 and full funding to conduct WGS on 50 select positive TB specimens through June 2020. Special recognition goes out to Dr. William Glover's Proposal Team members that worked diligently to conduct proof of concept studies and write the award-winning proposal. The team includes Tish Barton, Dr. Shermalyn Greene, Tom Lawson, Ashleigh DaGrosa, Kitty Chase, Shadia Rath, Robin O'Brien, Robbie Hall, Rola Abdelraheim, Vilma Gonzalez, Brandon Skinner and Steven Bowen. Thank you all for a job well done!!



Proposal Team Members front row: Tish Barton, Robbie Hall, Shadia Rath, Ashleigh DaGrosa. Back row: Rola Abdelraheim, Kitty Chase, Tom Lawson, Robin O'Brien, Dr. Shermalyn Greene, Dr. William Glover, Brandon Skinner, Vilma Gonzalez. Not pictured: Steven Bowen.



## Got Flu? Become an ILINet Provider!

Colder weather is coming, and flu season arrives with it. Health care providers, including the North Carolina State Laboratory of Public Health (NCSLPH), are on the front-line during flu season. As part of the fight against flu, the NCSLPH has been continuously participating in the U.S. Outpatient Influenza-like Illness Surveillance Program (ILINet

Sentinel Program) since the 2000-2001 season. ILINet is a collaborative effort between CDC and its partners, including local health departments, public health and clinical laboratories, and health care clinics. The network consists of approximately 35,000 enrolled providers in all 50 states and was initiated in the 1997-1998 flu season.

The program's goals include tracking drug resistance and vaccine efficacy, with the purposes of guiding flu prevention and control activities, and of informing next year's vaccine. This is achieved with the help of ILINet providers, who keep a record of the number of patient visits for influenza-like illnesses (ILI), report these numbers each week, and submit a portion of specimens collected to the NCSLPH.

The State Lab provides free influenza testing for ILINet providers. In addition to testing at the State Lab, samples are sent to the CDC for antiviral resistance testing, further virus characterization, and vaccine effectiveness testing. These cumulative efforts generate a representative picture of circulating viruses in a given season.

Submission of specimens for influenza testing is highly encouraged during flu season from October-May, but ideally providers should report year-round. For more information on becoming an ILINet provider, please contact the NCDHHS Influenza Coordinator Anita Valiani at [anita.valiani@dhhs.nc.gov](mailto:anita.valiani@dhhs.nc.gov).

Submitted by Rebecca Pelc, Sara D'Arcy  
Virology/Serology Unit



## New Industrial Hygiene Consultant Shares Her Journey to North Carolina

If you attended our most recent State Lab Program Update, then we've already been introduced. For those of you who missed it, allow myself...to introduce myself (Austin Powers anyone?). To really know me is to know that I quote movies and Stephen King books in my everyday life. As of September 2019, I also happen to be one of the newest editions to the North Carolina State Lab of Public Health (NCSLPH) Safety Team, the Industrial Hygiene Consultant (IHC).

I graduated with a BS in Biology from George Mason University where I was also a member of the GMU Swimming and Diving Team. For all you fellow swimmers out there, my event was 200 fly. After undergrad I spent a few years in Washington, DC working for a trade association management company, and specifically for the trade association, The Flavors and Extracts Manufacturers Association (FEMA). We were all about food safety at FEMA, and we worked with member companies to Generally Recognize as Safe (GRAS) flavoring additives and extracts that they wanted to put in their beverages and snack foods. We also worked with the World Health Organization to draft toxicology monographs that were published and used as intake/exposure assessments for different chemical substances in food. Although I loved being a young professional in Washington, DC after reading at an early age the book, Hotzone, (Richard Preston > Robin Cook...just saying), I became increasingly interested in infectious diseases and how they affected public health, so I packed up my life and moved back home to St. Louis, Missouri, to get my Master of Public Health at Saint Louis University (SLU). At SLU, I jointly concentrated in Environmental and Occupational Health, and Biosecurity and Disaster Preparedness.

After graduate school, I packed up my life again, which was just two suitcases at this point, and moved to the greatest city in the world, New York City (NYC)! My first job out of grad school was an industrial hygiene position with the NYC Department of Environmental Protection (DEP). This was a great first job out of school as it gave me real-world hands-on health and safety experience; however, much of the health and safety I was doing was construction safety, and that really wasn't my bag. Luckily for me, my dream job popped up around my three-year anniversary working with the NYC DEP, and naturally I applied.

In March of 2016, I became the Biosafety Officer (BSO) for the NYC Department of Health and Mental Hygiene's Public Health Laboratory (PHL). I can't tell you how many times I walked past this scaffolding covered government building in Manhattan and thought to myself, "Man, it would be so cool to work there." Finally, I had made it. While working for the NYC PHL, I not only became the Chief of Health and Safety (in addition to my BSO responsibilities), but I built an entire health and safety, and biosafety program for 13 floors and 180 employees by performing risk assessments, reviewing/creating safety standard operating procedures, and creating fun and engaging trainings. I was also tasked with performing outreach to clinical laboratories in all 5 boroughs to provide assistance and resources as needed that would allow them to strengthen their own biosafety programs. Additionally, I was the Alternate Responsible Official (ARO) for our Tier I Select Agent Program. As the ARO I worked closely with our FBI Weapons of Mass Destruction (WMD) coordinators. One of the many cool things

## NEW INDUSTRIAL HYGIENE CONSULTANT SHARES HER JOURNEY TO NC CONTINUED



Anna Liddicoat (r) and colleague participate in FBI UNGA Sweep.

I got to participate in was when our WMD Coordinators let my Biothreat Response Lab Coordinator and me go on what they called UNGA Sweeps. Every year in September, the United Nations holds its big General Assembly. During UNGA Sweeps, the FBI drives around mid-Manhattan with special instruments that can detect bombs. They also let us briefly try on their tactical vests (see picture, I'm on the right). Riding along helped us understand the scope of the role they played for our city in addition to the work they do with laboratories.

After six years in NYC and being able to officially call myself a New Yorker, my husband and I decided it was time to shake things up and live somewhere a little bit more affordable and sustainable for a family. Turns out Raleigh was that place for us.

As the new IHC for the SLPH, I am looking forward to getting into the labs, and reviewing our health and safety polices to see where we can make improvements. I'm also looking forward to aiding our health departments and other public health partners in any health and safety questions they might have. I can provide knowledge and/or resources on topics such as site safety inspections, risk assessment, hazardous waste management programs, biosafety, lab safety inspections, safety training, and hazards exposure monitoring. Please feel free to reach out anytime, my safety door is always open!

Submitted by Anna Liddicoat  
NCSLPH Industrial Hygiene Consultant

## Clinical Lab Day Highlights Collaboration

The Laboratory Improvement Unit at the North Carolina State Laboratory of Public Health (NCSLPH) hosted the fifteenth annual Clinical Lab Day on October 4, 2019 in Raleigh. The day-long educational conference brings together laboratorians, nurses, physicians, disease intervention personnel and other health care professionals. This year's program, titled "We Are Public Health In North Carolina" emphasized the work that can be accomplished through the strong collaborations between laboratorians, epidemiologists and local health care providers.

To illustrate how these groups work together to investigate and resolve incidents affecting public health in the state, three case studies were reviewed. Discussed were:

- a novel carbapenem-resistant Enterobacteriaceae (CRE) identified from a patient at UNC Medical Center
- a potential HIV outbreak from injection drug use in western North Carolina, and
- a novel enteroinvasive *E. coli* (EIEC) outbreak at a potluck in Mecklenburg County.

During each case, representatives from the State Lab and the Epidemiology Section discussed how information contributed by both groups is used to guide infection control practices, assist in patient care, and prevent additional cases. The important role of public and private health care organizations in initially identifying these cases and carrying out proper notification and sample submission was emphasized as well. A panel discussion was held after the case studies to address questions relating to the presentations.

The new State Lab Director, Dr. Scott Shone, presented opening remarks. The head of the Communicable Disease Branch, Evelyn Foust, concluded the conference with a discussion of the importance of each of our roles, no matter what they are, in enhancing public health in our community and our state.

Attendees networked with colleagues, visited with vendors and enjoyed the lively audience participation and excellent speakers, all of which helped to make this year's Clinical Lab Day a success! As one attendee stated, "Great topics all related to issues currently being faced in the field. The emphasis on partnership and collaboration was wonderful."

Submitted by Patty Atwood  
Laboratory Improvement Coordinator



Vendors prepare to showcase new products at Clinical Lab Day 2019.

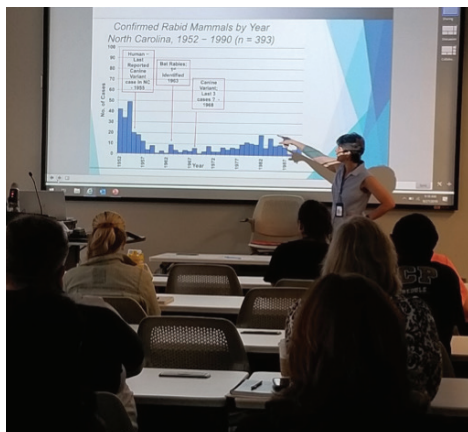


Attendees enjoyed an excellent meal during the conference.

## World Rabies Day 2019: Vaccinate to Eliminate

The North Carolina State Laboratory of Public Health (NCSLPH) celebrated the 13th World Rabies Day on September 27, 2019. World Rabies Day was established in 2007 to raise rabies awareness and to improve rabies control efforts. This year's theme was "Rabies: Vaccinate to Eliminate," focusing on pet vaccination and on post-exposure prophylaxis (PEP). Speakers at Rabies Day included Dr. Erica Berl of the NC Division of Public Health Communicable Disease Branch, Dr. David Webster from UNC Wilmington, Seth Brown of USDA Animal and Plant Health Inspection Service (APHIS), and the State Lab's own Jenna Hunter and Laura Dow. Activities included a crossword puzzle, word search, and a screening of "Old Yeller," with snacks provided.

Dr. Erica Berl of the Communicable Disease Branch spoke about rabies in North Carolina. Rabies is an acute encephalitis or meningoencephalitis due to a lyssavirus infection. In the United States, rabies-associated costs are an estimated \$245 - \$510 million annually; costs include vaccination of companion animals, diagnostic testing, and post and pre-exposure prophylaxis. In North Carolina, the animals with the highest rates of rabies positivity are foxes, raccoons, skunks, and bobcats. People can be exposed to rabies from these or other animals via contact with the animal's saliva or nervous system tissue. Petting an infected animal does not count as exposure. Nevertheless, please don't touch wildlife!



Dr. Berl presenting to a rapt audience

Dr. Webster described his lab's work with bats received from the State Lab. There are 17 species of bats in North Carolina. Big Brown Bats (*Eptesicus fuscus*) comprise most of the bats submitted for testing, with their rabies positivity rate around 2% in 2018. The Eastern Red Bat (*Lasiurus borealis*) had a 10% positivity rate, while the Tricolored Bat (*Perimyotis subflavus*) had a rate of 25%. The bats most likely to have rabies are least likely to come into contact with people, but if you see a bat, don't touch or hurt it.

Seth Brown is a wildlife biologist with APHIS in western North Carolina. APHIS is involved with the VRG+ program, which aerially distributes the oral rabies vaccine (VRG) in Ashe and Allegheny counties. The vaccine is administered in packets coated with fish meal and fish oil; wild animals find the packets and chew them, releasing the vaccine. VRG is safe for over 60 species, including dogs. After dropping the vaccine, APHIS captures live raccoons from the bait zone, performs health assessments of the animals, and tests their blood for Rabies Virus Neutralizing Antibodies (RVNAs). They also survey roadkill, sick-acting, or dead animals found in the bait zone.

Jenna Hunter described a normal day in the SLPH necropsy lab. Upon receiving a potentially infected specimen, technologists remove the animal's brain, make slides, fix the tissue, stain, and interpret results. Since brain tissue is the only tissue examined in the diagnosis of rabies, only the animal's head should be submitted for diagnostic purposes. Small animals no larger than a squirrel may be submitted whole. For bats, the entire dead animal must be submitted. If an animal with a head larger than that of a goat or large dog needs to be submitted for rabies testing, the animal should be first submitted to the nearest Animal Disease Diagnostics Laboratory (i.e. Rollins in Raleigh, NC) for brain removal. After the brainstem and cerebellum or hippocampus have been tested at the State Lab, the lab will call and give



Dr. Webster answers questions about bats in NC.

results if positive or unsatisfactory (results are not faxed). Specimens may be unsatisfactory due to decomposition or trauma.

Packing and shipping rabies specimens to the State Lab was covered by Laura Dow. Packing according to Department of Transportation (DOT) specifications ensures specimen integrity and handler safety. A primary container, absorbent material, secondary container, cold packs, and biohazard labels are required. Do not wrap the specimen in the absorbent material, as staff must be able to see the specimen, and do not use wet or dry ice. Fill out one form per specimen. Proper packaging and shipping of specimens enables staff to get clearer results faster and makes everyone happier!

Thank you to everyone who organized the Rabies Day events, and to everyone who attended! For more information on World Rabies Day, please visit the Global Alliance for Rabies Control at <https://rabiesalliance.org/>.

Submitted by Sara D'Arcy  
Virology/Serology Unit





## New Additions and Kudos!

### NEW EMPLOYEES

The North Carolina State Laboratory of Public Health (NCSLPH) is pleased to welcome the following new employees:

- **Administration** – Dr. Scott Shone, Anna Liddicoat, Jose Hernandez
- **Operations** – Joannette Farmer
- **Environmental Sciences** – Sue Ann Grant
- **Microbiology** – Dr. Kimberly Starr
- **Molecular Epidemiology** – Vijayalaxmi Molleti
- **Newborn Screening** – Crystal Henderson, Jagan Kandukuri, Jarin Tasnim
- **Pre-Analytical** – Lawrence Wade, Kristin Jones

### NCWOA EDUCATOR OF THE YEAR

Congratulations to Chris Goforth, manager of our Environmental Services Unit! Chris was selected as the Educator of the Year for the North Carolina Waterworks Operators Association (NCWOA). Chris has been a long-time member and co-chair of the Lab Analyst Committee and Lab Tech Day Planning Committee in the NCWOA. He presents the Certification Update portion of Lab Tech Day, and stays in touch with water systems, communicating updates and doing inspections. Another aspect of Chris's job is teaching the Bacterial Methods for the Analysis of Drinking Water Workshop, as well as preparing and editing the notebooks for the class. His educator experience also includes several years of teaching a microbiology class at a community college. One previous student said of Chris, "He often weaves in interesting stories to make it more interesting and applicable. For example, he has a Jeopardy review in his classes that makes the class review fun." A big thank you goes to Chris for his many contributions in this area!

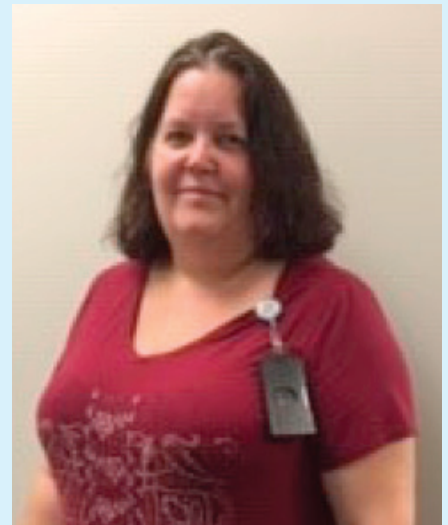
#### Kudos to our

### EMPLOYEE OF THE QUARTER

for outstanding service and contributions!

#### Addenna Cox – Pre-Analytical

Congratulations to Addenna Cox, our third quarter Employee of the Quarter. Addenna works in our Pre-Analytical Services Department and is being recognized for her commitment to quality improvement. She has worked diligently to support STARLIMS V11 migration of data entry for Virology/ Serology testing services. Her troubleshooting skills are invaluable, and she has taken initiative in working with IT, quality assurance, and others in resolving technical issues. She has been an exceptional resource for other data entry team members, allowing for a smooth transition to V11. Thank you, Addenna!



Addenna Cox – Employee of the Quarter



Chris Goforth accepts the Educator of the Year award from Jeff Isley of NCWOA

Compiled by Angie Bradley  
Lab Improvement Unit



# Winter/Spring 2020 LABORATORY IMPROVEMENT



## January – June 2020 Workshop Schedule

DATE	WORKSHOP	REGISTER BY
January 8, 2020	Microscopy: Viewing and Reviewing	December 8, 2019
January 9, 2020	Examination of a Vaginal Wet Mount	December 9, 2019
February 4-6, 2020	Bacteriological Methods for the Analysis of Drinking Water	January 6, 2020
February 12-13, 2020	Lab Methods in the Diagnosis of Gonorrhea	January 13, 2020
March 26, 2020	2020 Packaging and Shipping Regulations (Greensboro)	February 26, 2020
April 2, 2020	Bioterrorism Preparedness for Clinical Laboratories	March 2, 2020
April 15, 2020	Microscopy: Viewing and Reviewing	March 15, 2020
April 16, 2020	Examination of a Vaginal Wet Mount	March 16, 2020
April 23, 2020	2020 Packaging and Shipping Regulations (Clay County)	March 23, 2020
May 19, 2020	2020 Packaging and Shipping Regulations (State Lab)	April 19, 2020
May 21, 2020	2020 Packaging and Shipping Regulations (Greenville)	April 21, 2020
June 18, 2020	Evaluation of a Stat Male Smear	May 18, 2020
June 25, 2020	2020 Packaging and Shipping Regulations (Durham VAMC)	May 25, 2020

*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 <http://slph.ncpublichealth.com> or contact Lab Improvement at 919-733-7186.*

### 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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