

PUBLIC HEALTH LABORATORY NEWSLETTER

Rickettsia Real-time PCR Assay Added To PHL Test Menu

Submitted by Dorothy Baynham, MT(ASCP) | PH Laboratory Manager 3, Special Microbiology

The Tennessee Public Health Laboratory is pleased to announce the addition of *Rickettsia* Real-time PCR Assay at the Nashville Central Laboratory. This assay will provide the qualitative detection and differentiation of *R. rickettsii* and *R. prowazekii* DNA. It is intended for the use with specimens from individuals with signs or symptoms indicative of Rocky Mountain Spotted Fever, epidemic typhus or other rickettsial infections and epidemiological risk factors consistent with potential exposure.

The *Rickettsia* genus can be located globally. *R. prowazekii* can be attributed to worldwide infections while *R. rickettsii* infects primarily the Western

Hemisphere. In addition, at least nine different species of *Rickettsia* are classified in the Spotted Fever Group and two different species in the typhus group.

Any presumptive positive results for the *Rickettsia* Real-time PCR Assay will require confirmation testing by the CDC. Since there are so many species of *Rickettsia*, it is important to note that negative results do not preclude the diagnosis of Rickettsia infection and should not be used to prevent or delay treatment or other patient management decisions.

This addition expands the testing capabilities at the TN Public Health Laboratory to better meet the needs of Tennesseans.

Sample Submission:

Prior consultation is required. Request for consultation with epidemiology should be made through VBD.Health@tn.gov or 615-262-6365.

Other submission requirements:

- Specimens must be submitted within 14 days of illness onset or within 48 hours of initial treatment.
- A minimum of 1 ml of EDTA or ACD-A preserved whole blood collected no greater than 48 hours and stored at 2-8°C.
- A completed PH-4182 Clinical Submission Requisition (REV 9-21) with any travel history (domestic or international) to areas where RMSF is endemic.

Well Water Testing Now Available

Submitted by Kristin Dunaway | PH Laboratory Manager 1, Environmental Microbiology

Currently, there are no regulations governing well water testing in place for the state of Tennessee, although federal recommendations encourage annual testing for bacterial and chemical contaminants. The Tennessee Public Health Laboratory, in collaboration with the Communicable and Environmental Diseases and Emergency Preparedness Waterborne Program, is now offering well water testing. This initiative is made possible through federal funding from the CDC Environmental Health Capacity program. This testing will be offered initially at no cost, on a referral basis or as requested for private citizens, campgrounds and businesses utilizing well water.

All well water received will be tested for total coliforms and *E. coli* (presence/absence), fluoride, nitrite, nitrate, total dissolved solids, lead, copper and arsenic (which was a component used in pesticides before banned). Test results and remediation guidance will be provided to citizens and business owners through the Communicable and Environmental Diseases and Emergency Preparedness Waterborne Program team. Information and sampling materials will be made available at county health departments throughout the state. For more information or to request sampling kits, please contact TDOHENVLogin.Health@tn.gov. For questions regarding sample results, contact Judy Manners, Environmental Health Specialist, Judy.Manners@tn.gov.

Keeping it Clean: The Public Health Laboratory's Role in Monitoring Tennessee's Environment

Submitted by Bill Moore | PH Laboratory Consultant 2, Environmental Quality Assurance

One of the most essential services a government provides for its citizens is a clean and safe environment in which to live, work and play. The Tennessee Public Health Laboratory maintains a primary role in providing that service for the residents of Tennessee. Each year scientists at the laboratory analyze approximately 50,000 environmental samples for a variety of chemical, radiological and biological pollutants. Environmental testing sections of the laboratory include Aquatic Biology, Radiochemistry, Environmental Microbiology, Metals and General Inorganics. Each of these sections plays a pivotal role in working with environmental consultants and data analysts from the Tennessee Department of Environment and Conservation as they monitor Tennessee's environment.

Aquatic Biology analyzes samples from the waterways of Tennessee. Aquatic Biology is the only section of the environmental laboratory that goes into the field to collect samples. Aquatic biologists collect fish samples for analysis of mercury and other contaminants and analyze ambient water samples for biological life which indicates the quality of the water. This testing enables TDEC to determine "Do Not Consume" fish advisories or "No

Swimming" postings for the lakes and rivers of Tennessee.

The Radiochemistry section of the laboratory analyzes samples from a multitude of matrices including, but not limited to water, vegetation, soil, milk, wastewater treatment plant sludge and biota. The bulk of these samples come from the immediate vicinity of one of two nuclear power plants functioning in Tennessee. Data from this testing helps TDEC analysts in the Division of Radiological Health ensure that radioactive material associated with the production of nuclear energy is not being released into the environment of Tennessee. There are also more broad applications of this testing of environmental samples that can be applied to local landfills, scrapyards or even nuclear events from around the world that may cause spikes in local levels of radioactivity.

The Environmental Microbiology section of the laboratory tests drinking water, private wells and source water for total coliforms. TDEC monitors source water, which refers to rivers, lakes and streams, for sudden increases or decreases in coliforms which would be indicative of contamination issues. Environmental Microbiology also tests samples from Public Water Systems for coliforms

and *E. coli*. These tests are conducted as routine monitoring and in special cases of illnesses where contamination is suspected.

The Metals and General Inorganics sections are generally focused on water testing, but also test additional matrices such as soil and vegetation for metals and other contaminants. The bulk of monitoring testing conducted in the environmental laboratory is done by metals and inorganics. Analysis is conducted primarily on ambient waters. Occasionally, an inspection sample is collected for analysis. Inspection samples are samples from waterways or even households where contamination is suspected. The environmental laboratory sections are audited by the Environmental Protection Agency once every three years and certified for drinking water methods employed for water analysis. Additionally, the laboratory is audited once every other year by the American Association for Laboratory Accreditation which grants accreditation according to the International Organization for Standardization, standard 17025. ISO 17025 specifies the general requirements for the competence, impartiality, and consistent operation of laboratories.

Environmental Laboratory Spotlight: Inorganic Chemistry and Metals

Submitted by Patrick Leathers | PH Laboratory Manager 2, Environmental Chemistry

The General Inorganics and Metals sections within the Environmental Division of the Tennessee Public Health Laboratory provide analysis for water sources in Tennessee. Working in conjunction with TDH and other state agencies, these sections provide valuable testing services that allow the ability to track toxins and hazards when necessary. Nutrients from agricultural runoff are one of the major subsets of analytes tested by the General Inorganics section. This testing allows for monitoring of nutrient levels such as nitrogen, ammonia, and phosphorus, that could lead to toxic algal blooms or Methemoglobinemia (blue baby syndrome). The section also can test for solids and turbidity, which could indicate that certain bacteria may be present in the water or if water from waste treatment facilities has

been fully treated before release. Anion testing also occurs in this section and is indicative of additives and minerals in drinking and surface water.

The Metals section tests for the largest number of elements within the environmental sections. This section screens for elements in water, however they also test additional sample types such as fish, soil, and vegetation. Analysis for elements such as aluminum and tin are conducted in this section. Testing is also performed to detect metals such as arsenic, lead, or mercury, that may negatively impact the water and/or food supply. When performed on water and fish samples, results from these tests provide information related to stream health and consumption safety. Depending on the elements and their concentration in

certain areas, the health of the environment and the citizens of the State of Tennessee can be impacted.

Testing provided by these sections is valuable in the assessment of a spill site and the surrounding areas following an accidental release of hazardous materials. The Public Health Lab has performed testing on numerous samples as part of the response to previous spills. The Metals section has also worked alongside Tennessee Poison Control to provide testing to help determine the cause of metal (lead) contamination and prevent future harm.

The services provided by the General Inorganics and Metals sections are critical to monitoring water quality across the state. These tests help ensure the quality of Tennessee's rivers and streams to allow use for water supply, swimming, fishing, and tourism for years to come.

CDC Antimicrobial Resistance Lab Network Site Visit

Antimicrobial Resistance colleagues from CDC visited the TN Public Health Laboratory August 23 through August 25. During the visit, CDC staff toured the laboratory facility and met with TN Public Health Laboratory staff. The team also reviewed highlights from the TN ARLN program and provided strategies for future growth and development of the TN Public Health Laboratory's role as the Southeast Regional Laboratory. A special focus of the visit was the implementation of whole genome sequencing for *Candida auris*, as it continues to be an increasing public health concern.



Second Tier Testing for Congenital Adrenal Hyperplasia

Submitted by: Valerie Ragland | PH Laboratory Manager 2, Newborn Screening

Congenital Adrenal Hyperplasia is an inherited disorder of the adrenal glands that can affect both males and females. CAH is caused by inherited defects in steroid biosynthesis where there is a deficiency of the hormone 21-hydroxylase in 90% of cases and 11-beta hydroxylase in 5% of cases. These hormone imbalances can lead to salt wasting crises in the newborn and incorrect gender virilization of females.² Nonspecific symptoms that may also present themselves are, poor feeding, vomiting, and diarrhea which can be mistaken for gastrointestinal issues.¹ When initiated early, hormone replacement therapy can result in a significant reduction of morbidity and mortality in infants with CAH.

The conventional method for testing CAH involves measurement of 17 α -hydroxyprogesterone, also referred to as 17-OHP, and testing is performed by immunoassay methodologies. Immunoassay testing for CAH became available in 1977. One downfall is that these assays appear to be hampered by cross-reactivity of antibodies from other steroids causing them to yield a high rate of false positive results.

On May 1, 2022, Tennessee Newborn Screening program began sending specimens on patients that had elevated CAH when tested by the TN Public Health Lab to Mayo Clinical Laboratories for second-tier steroid profiling. This method for second-tier testing uses liquid chromatography-tandem mass spectrometry (LC/MS/MS) and



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measures other steroids such as androstenedione, cortisol, 11-deoxycortisol and 21-deoxycortisol.² With the second-tier test, patients with CAH are readily identified with the subsequent decrease of false positive results.

Second-tier testing performed by tandem mass spectrometry is still considered a screening test and not diagnostic. Even though the positive predictive value of the second-tier test is considerably higher than that of the immunoassay testing (9.0% vs 0.5%), false positives can occur.² Due to this, results should be followed up by serum testing of both 17-OHP and deoxycorticosterone.

In addition to the conventional assay that is performed for CAH, the Tennessee Newborn Screening program anticipates starting an in-house validation of the second-tier LC/MS/MS assay shortly with a go-live date scheduled for early 2023.

References

1. Lacey, J.M. et al, (2004), Improved specificity of newborn screening for congenital adrenal hyperplasia by second tier steroid profiling using tandem mass spectrometry, *American Association for Clinical Chemistry*, 50:3, 621-625. Retrieved from <https://academic.oup.com/clinchem/article/50/3/621/5639824>
2. CAH2T-Overview: Congenital Adrenal Hyperplasia Newborn Screen, Blood Spot <https://www.mayocliniclabs.com/test-catalog/Overview/42202>

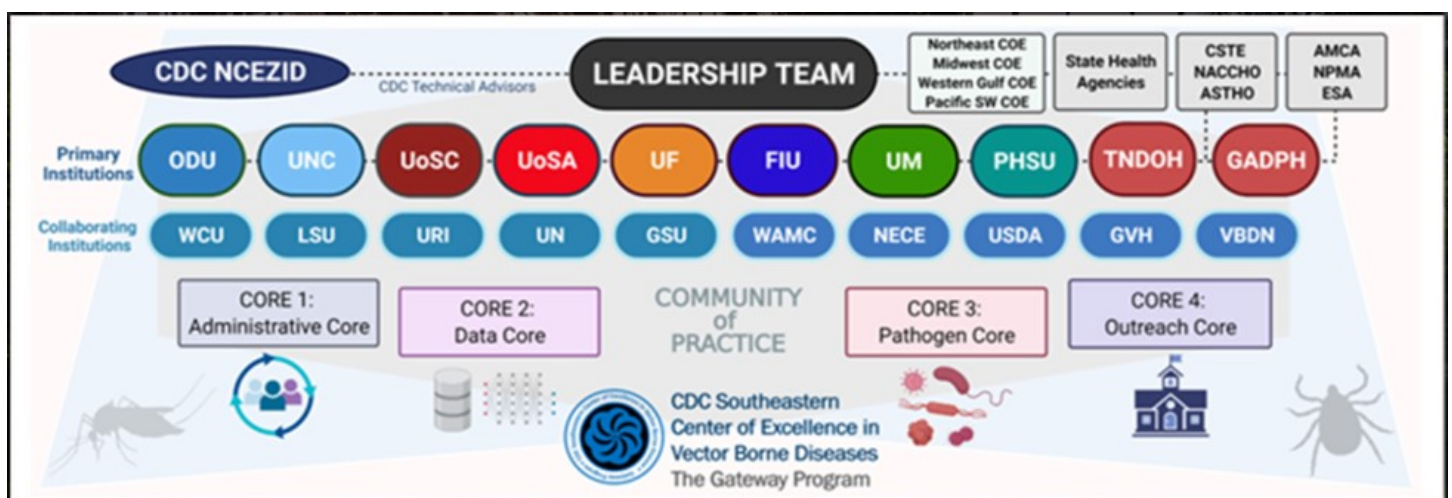
TDH continues fight against diseases spread by ticks through partnership with the CDC Southeast Regional Center of Excellence in Vector-Borne Diseases

Submitted by: Abelardo Moncayo | Director, Vector-Borne Diseases Program

[Established in 2016](#), the [Southeast Center of Excellence in Vector-Borne Diseases](#) will continue its work for another five years, thanks to renewed funding from the Centers for Disease Control and Prevention. The center will increase research and outreach activities related to the spread of tick-borne diseases in the southeastern United States with the aim of generating a better understanding of where ticks and tick-borne infections are appearing in the region and how this can inform control measures.

The Tennessee Department of Health, Vector-Borne Diseases Program has worked with the SECVBD in conducting statewide tick surveys, pathogen testing and workforce training. “For the past two years we have led Tick University workshops to support CDC’s and SECVBD’s mission to grow the community of practice in public health entomology, epidemiology, and laboratory science. We look forward to our continued partnership with the SECVBD,” said Dr. Abelardo Moncayo, Vector-Borne Disease Program

Director at TDH. Additionally, the VBD program will continue to serve as a hub for tick pathogen testing for Tennessee and other partner states and as a host site for summer research fellows of the SECVBD giving practical world experience in public health entomology to individuals from diverse training backgrounds and levels. Serving as a Co-Principle Investigator on this grant will allow TDH to provide leadership in the steering of the important projects being conducted by the SECVBD.



The Vector-Borne Diseases Program, housed within [CEDEP](#), conducts surveillance on mosquito-borne, tick-borne, and other vector-borne diseases to measure the burden and risk of diseases in Tennessee. The program also performs education and outreach activities on vector-borne diseases by using data collected by environmentalists, laboratorians, and epidemiologists.

For more information on Vector-Borne Diseases in Tennessee, see: <https://www.tn.gov/health/cedep/vector-borne-diseases.html>

TN Public Health Laboratory Consultative Services

The Tennessee Public Health Laboratory employs several Public Health Laboratory Consultants that are available to provide consultative services to laboratories across the state. These services include, but are not limited to, biosafety consultation and risk assessment, continuing education seminars and workshops, and communication to Sentinel laboratories.

Meet Public Health Laboratory Consultant: Rolinda Bailey, BS, MT(ASCP), CHS



Biosafety Officer
Responsible Official
Select Agents and Toxins

Years in Biosafety: 6

Professional Memberships:

- ABSA, American Biological Safety Association International, www.absa.org
- APHL, Association of Public Health Laboratories, www.aphl.org
- SEBSA, Southeastern Biological Safety Association, www.sebsa.org

Areas of Expertise:

- Select Agent Regulations
- General Diagnostic Laboratory Testing
- Safety Risk Assessment
- Histocompatibility for Transplantation

Contact Information:

TN Department of Health
Division of Laboratory
Services
630 Hart Lane
Nashville, TN 37243

Office: 615-262-6318

Cell: 615-499-0072

Email Address:

rolinda.bailey@tn.gov

Most noteworthy biosafety-related accomplishment:

Offering tools and facilitating clinical diagnostic laboratory training across TN on how to perform Biosafety Risk Assessments.

Areas of Consultation:

Outreach to clinical diagnostic labs across TN through on-site visits, webinars, resources, etc. to promote, teach and train regarding biosafety and emergency preparedness.

Dr. Marc Rumpler Accepted as a Fellow of the AACC Academy

Marc J. Rumpler, MS, PhD, DABCC, FAACC, NRCC, DLM (ASCP)SC^{CM}, Environmental Laboratory Division Director, has been accepted as a Fellow of the American Academy for Clinical Chemistry Academy (formerly NACB). He was recognized at the annual AACC meeting in July during the Fellow Awards Luncheon. AACC Fellowships are open to doctoral level clinical scientists who are AACC members and meet the academy's membership criteria.

Training News

The Safe Transport of Division 6.2 Infectious Substances, Biological Specimens, Dry Ice & Related Materials

Delivered by Saf-T-Pak and supported by the Association of Public Health Laboratories

DESCRIPTION

Participants in Saf-T-Pak's one-day virtual seminars receive the comprehensive Saf-T-Pak Training Reference Manual and take part in hands-on exercises to correctly pack, mark, label and document a shipment using actual UN-specification packaging. The training meets the requirements outlined by IATA, ICAO and US DOT 49 CFR regulations.

AUDIENCE

This virtual seminar is designed for laboratorians who package, ship and transport Division 6.2 hazardous materials.

DATES AND TIMES [Multiple sessions available](#)

COURSE FLYERS [9 am - 4 pm EST](#) [11 am - 6 pm EST](#) [2 pm - 9 pm EST](#)

REGISTRATION:

https://stateoftennessee.formstack.com/forms/22_23_virtual_pands

CONTINUING EDUCATION:

Saf-T-Pak is approved as a provider of continuing education programs in the clinical laboratory sciences by the ASCLS P.A.C.E.® Program. Participants who successfully complete this program will be awarded 8 contact hours.

SARS-CoV-2 Surveillance: Sequencing and Detection Webinar

Hosted by TDH Laboratory Services

DESCRIPTION

Since the onset of the pandemic, several variants of SARS-CoV-2 have emerged. During this webinar, the mechanisms by which these variants occur and are identified will be discussed. Tennessee Public Health Laboratory's role in the surveillance and an overview of the sequencing process used to detect different variants will also be described.

AUDIENCE

This basic level workshop is designed for Medical Laboratory Scientists and Medical Laboratory Technicians working in laboratories in Tennessee.

SPEAKER

Victoria Stone, PhD, Public Health Laboratory Consultant 2, TDH Division of Laboratory Services

DATE AND TIME

Tuesday, November 8, 2022 1:00 pm (Central) [Flyer](#)

REGISTRATION

<https://tn.webex.com/tn/j.php?RGID=rbd7bf8dfbef31f5fc6754dea42f73e4b>

CONTINUING EDUCATION

TDH Laboratory services is approved as a provider of continuing education programs in the clinical laboratory sciences by the ASCLS P.A.C.E.® Program. Participants who successfully complete this program will be awarded 1 contact hour.

For a complete listing of upcoming TDH DLS training opportunities, please visit the TDH Laboratory Services Training and Workshops webpage

<https://www.tn.gov/health/health-program-areas/lab/lab-education.html>

Welcome New Employees!

Rebecca Harrell

PH Laboratory Scientist 1
General Bacteriology

Hailee Nelson

PH Laboratory Technician 2
Laboratory Support Services

Katy Salazar

PH Laboratory Scientist 1
Newborn Screening

Jazmyne Jackson

PH Laboratory Scientist 1
Newborn Screening

Patrick Burnett

PH Laboratory Technician 2
Environmental

Todd Lindahl

Stores Manager
Laboratory Support Services

Chelsea Cash

Assistant Director of Admin Services
and Human Resources

Sarah Knoke

Admin Services Assistant 3
Human Resources

Promotions

Sheila Speakman

Admin Services Manager
Administration

Rebecca Harrell

PH Laboratory Scientist 2
General Bacteriology

Kirsten Welch

PH Laboratory Scientist 2
Special Microbiology

Elora Fullerton

Procurement Officer 2
Administration

Daniel Wade

PH Laboratory Scientist 2
Inorganic Chemistry

Brielle Conway

PH Laboratory Scientist 3
General Bacteriology

Marka Smith

PH Laboratory Scientist 3
Aquatic Biology

Kim Walker

PH Laboratory Scientist 3
Radiochemistry

Liza Vega-Ross

PH Laboratory Scientist 2
Knoxville Regional Lab

Chanice Wilkes

PH Laboratory Scientist 3
Whole Genome Sequencing

Rachel Gleason

PH Laboratory Scientist 3
Whole Genome Sequencing

Austin Hargrove

PH Laboratory Scientist 2
Whole Genome Sequencing

Devin Smith

PH Laboratory Scientist 2
Newborn Screening

Retirements

Luz Maderal

22 Years of Service
PH Laboratory Manager 1
Laboratory Support Services

Christina Moore

16 Years of Service
PH Laboratory Manager 2
Whole Genome Sequencing

Interested in a Public Health Lab Career?

Visit <https://www.tn.gov/health/health-program-areas/lab/lab-services-careers.html>
for current employment opportunities!

The Mission of Laboratory Services is to provide quality testing services through innovation, collaboration, and education that protects and improves the health of all.



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TN

Department of
Health

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