Lablink

Director, Bureau of Laboratories Sandip Shah, PhD, HCLD(ABB)





In this issue...

UPDATE: Temperature Requirements for Specimens **Received at the Bureau of Laboratories (BOL)** New Testing Methods at the Bureau of Laboratories Bacteriology Unit **Online Recognize, Rule Out, Refer: Bacterial Biothreat Agents Series Bureau of Laboratories Chemical Threat Training Coordinator Retires** Job Shadowing at the Bureau of Laboratories

*Editor's Note: Author correction/update - In the Fall 2024 edition, "Harmful Algal Blooms, Determination and Quantitation" was authored by Sneha Yeleti, M.S., Laboratory Scientist in the Environmental Organic Unit.

Bureau Vision

The Bureau of Laboratories is a stronger, more diverse team within an integrated public health system. We utilize advanced technology and innovative leadership to provide comprehensive public health services in our dynamic global community.

Bureau Mission

We are dedicated to continuing leadership in providing quality laboratory science for healthier people and communities through partnerships, communication and technical innovation.

Visit our webpage at Michigan.gov/ **MDHHSLab**

LabLink is published quarterly by the Michigan Department of Health and Human Services Bureau of Laboratories to provide laboratory information to Michigan health professionals and the public health community.

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Editor: Heather Seymour

3 6

8

9

Stay Current

UPDATE:

Temperature Requirements for Specimens Received at the Bureau of Laboratories (BOL)

By Katherine Wubbeling, BOL Virology Section Co-Authors: Matt Bashore, Data and Specimen Handling Unit Manager; Dr. Katie Margulieux, HIV, Molecular, and Rabies Unit Manager; and Kristine Smith, Bacterial and Viral Serology Unit Manager.

The proper collection and shipment of clinical diagnostic specimens to a testing laboratory is a critical component of ensuring a quality test result. Per accreditation requirements, and to comply with quality standards for clinical testing, the BOL will be monitoring specimen temperature upon receipt in the laboratory. Recorded temperatures will be used to determine if the specimen meets proper temperature requirements for testing.

Samples that do not meet temperature requirements upon arrival at the BOL WILL BE REJECTED.

Here are key points to ensure samples arrive in proper testing conditions:

- All serum specimens must be transported to the BOL at refrigerated temperatures (2-8°C) on frozen cold packs or frozen on dry ice.
- Specimens for Neisseria gonorrhoeae and Chlamydia trachomatis detection may also be submitted in the same package as serums if there is no dry ice (only frozen cold packs), since the acceptable temperatures for these samples are ambient and cold. Continue to submit bacterial isolates at ambient temperatures.
- HIV-1 treatment monitoring specimens require two shipping conditions:
 - 1. CD4/CD8 EDTA whole blood specimens must be shipped at room temperature.
 - 2. HIV-1 Viral Load plasma specimens must be shipped frozen or at refrigerated temperatures (2-8°C).
- For Measles, Rubella, and Mumps IgM testing, specimens stored at refrigerated temperature must be shipped immediately. If sample processing is delayed > 48 hours, specimens must be frozen at <-20 °C and shipped on dry ice to remain frozen during transport.

- Samples that have been stored in a freezer overnight must be sent on frozen cold packs. It is encouraged to include multiple frozen cold packs in one container to (or more) if there is not enough room to pack two frozen cold packs with the specimens.
- Please pack specimens in a Styrofoam container so the specimens and frozen cold packs retain the appropriate temperature during transport. Specimens shipped with only a cardboard box may warm or thaw during transport, resulting in rejection upon arrival.
- Specimens transported via courier should still be packed in a Styrofoam container outermost container "Refrigerate Upon Arrival." For specimens that require freezing, please label the outermost container "Freeze Upon Arrival."
- Updated collection information and requisition forms can be found here:
 - o Michigan.gov/MDHHSLab
- Shipping supplies can be ordered through MILKOTS.Michigan.gov. Select Kit 8A for serum shipping supplies and Kit 45 for Viral PCR testing. Individual items (e.g., Styrofoam coolers, cold packs, collection tubes, etc.) may be ordered as needed by contacting MDHHSLab@Michigan.gov.
- Please contact Matthew Bashore at <u>BashoreM@Michigan.gov</u> for packaging instructions and with any questions.

Examples of improper and proper submissions are shown on the following pages.

ensure maximum contact with the specimens. Please split shipments into two boxes

with frozen cold packs, even if specimens are transported in coolers. Please label the

o Michigan.gov/MDHHS/doing-business/providers/labservices/a-z-test-listing

Continued on page 4...

Update:

Temperature Requirements for Specimens Received at the Bureau of Laboratories (BOL) ...continued from Page 3



Continued on page 5...

Update:

Temperature Requirements for Specimens Received at the Bureau of Laboratories (BOL) ...continued from Page 4



-Specimens packed in Styrofoam box with multiple frozen cold packs and then placed in cardboard box.

-Requisition form bagged separately from specimens and placed above frozen cold packs to ensure maximum contact between specimens and cold packs.

UN33 3

- "Refrigerate (or freeze) upon Arrival" label on outermost container.

Page 5



New Testing Methods at the Bureau of Laboratories Bacteriology Unit

By Ashley Rogers, MS, BOL Microbiology Section

Carbapenems are considered one of the antibiotics of last resort for hard-to-treat gram-negative bacterial infections. The Michigan Department of Health and Human Services Bureau of Laboratories (MDHHS BOL) has noted an increase in resistance to carbapenems in members of the Enterobacterales, *Pseudomonas aeruginosa*, and *Acinetobacter baumannii* complex. This rise in resistance requires the need for rapid turnaround times and more comprehensive susceptibility testing for actionable results. The BOL Bacteriology Unit has been validating two new methods to aid in this ongoing challenge: NG-Test® CARBA 5 and susceptibility testing utilizing the Sensititre™ GN7F panel.

Current methods used in the Bacteriology Unit for the detection of the carbapenemase genes are costly. The new validated Hardy NG-Test® CARBA 5 method is less expensive and provides a more rapid result than current methods. The CARBA 5 is an in vitro FDA approved rapid and visual multiplex lateral flow assay for the qualitative detection and differentiation of the big five carbapenemase enzymes: *Klebsiella pneumoniae* carbapenemase (KPC)-type enzymes, New Delhi metallo-beta-lactamase (NDM), Verona integron-encoded metallo-beta-lactamase (VIM), Ambler Class D (OXA-48) and Imipenemase Ambler Class B (IMP). This assay will be performed on Enterobacterales and *Pseudomonas aeruginosa*. Enterobacterales submitted for CPO (carbapenemase producing organism) testing are subcultured with meropenem disks to maintain selective pressure and incubated 24 hours. Isolates growing up to the disk will be analyzed using the CARBA 5 assay to determine the carbapenemase(s) present, all others will have a phenotypic screening assay performed (Modified Carbapenem Inactivation Method or mCIM).

Organisms that display resistance by mCIM are analyzed using CARBA 5 to determine the carbapenemase(s) present. In 2021 the BOL added Cepheid GeneXpert® Carba-R to detect carbapenemase genes. During the past four years it has been observed that the majority of IMP variants circulating in Michigan are not detected by this method, which necessitated additional PCR testing to confirm IMP negative results. The CARBA 5 assay has demonstrated increased detection of these variants which will decrease most of this reflex testing saving cost and time.

The Bacteriology Unit previously utilized the Sensititre[™] GNX2F panel for characterization and monitoring of emerging threats. The GNX2F panel is a research use only broth microdilution panel that lacks newer β-lactam/β-lactamase inhibitor combination agents and lower dilutions for updated fluoroquinolone breakpoints. The data that is generated from susceptibility testing is key for epidemiological monitoring of emerging resistance. Therefore, a more comprehensive panel was validated within the Bacteriology Unit. The GN7F utilizes 96-well microtiter plates manufactured to meet the microbroth dilution test method described in the CLSI M07 Standard. The system utilizes true MIC results and includes extended cephalosporin and carbapenem ranges, as well as combination drugs such as ceftazidime/avibactam and ceftolozane/tazobactam.

Online Recognize, Rule Out, Refer: Bacterial Biothreat Agents Series

The Bureau of Laboratories (BOL) is pleased to announce a new online, on-demand course: Recognize, Rule Out, Refer: Bacterial Biothreat Agents Series.

The course design meets the needs for anyone wanting an overview of biosafety while handling possible agents of bioterrorism. PACE continuing education credits are available upon successful completion of this 1.5-hour course.

This intermediate level course provides a comprehensive overview of the role of Sentinel Laboratories within the Laboratory Response Network (LRN).

The course provides an understanding of the American Society for Microbiology (ASM) Sentinel Level Guidelines for each bacterial agent.

After course completion, participants must complete an evaluation and a post-test. All participants must achieve at least 80% passing score on their post-test before they are able to print out their training certificate.

To sign up for this course, access MI-TRAIN, <u>Train.org/MI-Train</u>, and search for course ID 1125920. Each participant will need to create a MI-TRAIN account if they do not already have one. For questions, or to schedule a live class, please contact Jason Wholehan at 517-335-9653 or by email at <u>WholehanJ@Michigan.gov</u>.





Bureau of Laboratories Chemical Threat Training Coordinator Retires

Teresa Miller, the MDHHS Bureau of Laboratories (BOL) Chemical Threat (CT) Response Training Coordinator, retired at the end of December 2024. Teresa started at the BOL in 2000 and worked in several areas of the laboratory during her time here. She began with the TB genotyping team in Molecular Biology before moving on to Virology, where she tested for arboviruses, hepatitis, IgG and IgA, and performed electron microscopy of smallpox and other viruses. She then went on to Newborn Screening, where she tested for cystic fibrosis and conducted mass spectrometry, and then to Quality Assurance. She ultimately landed in Laboratory Systems where she completed her career as the CT Response Training Coordinator. In this position, Teresa developed relationships with and trained several hospital employees in package and shipping for chemical threat agents. As a follow-up to her training, she also regularly administered exercises or drills. Through her efforts the BOL kept CT Level 3 activities in the forefront with our hospital partners.

Teresa wore many hats at the BOL and spearheaded several initiatives and projects over the course of her career. One job responsibility she took pride in was the publishing of the MDHHS BOL LabLink. She truly enjoyed writing, editing, and designing the quarterly publications as they tapped into her creative side. Teresa never shied away from a challenge and her standard of excellence leaves a legacy all here at BOL aspire to carry forward.

Teresa, thank you for your tireless dedication, your leadership, and the countless memories you've given us. While we can't imagine this place without you, we are so excited for the future you have ahead of you. You've earned every bit of it.





Page 8



Job Shadowing at the Bureau of Laboratories

By Juliana Banotai, BOL Explore Lab Science intern

As a junior at Michigan State University studying biochemistry, I am interested in exploring career opportunities and deciding how best to apply my degree. This led me to pursue a job shadowing experience at the Michigan Department of Health and Human Services Bureau of Laboratories. This laboratory encompasses various specialized units, all of which contribute significantly to the overall health and well-being of Michigan residents.

During my time at the lab, I had the privilege of observing the work done in several departments, including virology, microbiology, inorganic and organic chemistry, newborn screening, and environmental chemistry. Each unit operates with a blend of technical precision and analytical expertise, requiring both strong laboratory skills and a deep understanding of scientific principles. Furthermore, I learned how these units collaborate not only within the lab but also with external teams such as epidemiologists, lab groups from other states, and sample collection sites.

The professionals I met at the lab were incredibly knowledgeable and generous in sharing their experiences. They explained their roles within their respective units and how their work contributes to the health of Michigan communities. I also had the opportunity to speak with team members who offered valuable advice on potential career paths and educational opportunities.

This semester-long experience was profoundly impactful for me as a student. It provided clarity about the career paths that align with my interests and left me with a better understanding of the steps I can take as an undergraduate to achieve my goals. I now feel more confident about my academic path and have a clearer vision of how to position myself for success in the field of science and public health.

Page 9



The Explore Lab Science (ELS) program is a K-12 outreach program administered by the Bureau of Laboratories. This program provides fun and educational activities to K-12 students across the state to support STEM education and encourage the next generation of laboratorians. An unpaid internship is available for college students to assist the ELS program with developing activities and content for both in person events and for the ELS website and, in turn, provides the intern with opportunities to make contacts and learn about the role of the public health laboratory.

For more information about the Explore Lab Science program and internship, visit Michigan.gov/explorelabscience/intern.