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

LabLink

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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.



New Bioterrorism Training Coordinator

The Bureau of Laboratories is pleased to announce the appointment of Jason Wholehan, MLS(ASCP)^{CM}, as the Bioterrorism Training Coordinator effective March 22, 2021.

Over the past 9 years, Jason worked in the BOL Reference Bacteriology unit as a Microbiologist where he developed a strong interest in the Laboratory Response Network (LRN) methods and testing for agents of bioterrorism. He received advanced select agent training from both the LRN and Centers for Disease Control and Prevention (CDC).

In 2012, Jason began his Medical Laboratory Science (MLS) career at Saint Joseph Mercy Health System in their microbiology laboratory. His work experience at the hospital gave him a solid foundation and understanding of the challenges and needs of a busy clinical laboratory.

Jason is passionate about educating both the public and private sector on the essential work of Public Health Laboratories. In 2020, Jason was able to speak at the Upper Peninsula Environmental Health Association Conference on *Whole Genome Sequencing and Foodborne Illness*. Also, he virtually presented at the Michigan State University Science Festival on *Antimicrobial Resistant "Super Bugs"*.

Please join the Bureau and welcome Jason to his most recent position as Bioterrorism Training Coordinator. This position was previously held by Shannon Sharp who passed away unexpectedly on January 10th, 2021.

You may contact Jason for any matters related to Bioterrorism inclusive of training, testing, and laboratory emergency preparedness. He may be reached by phone at 517-335-9653 or email address at wholehanj@michigan.gov.



On-line Packaging and Shipping Recertification Course

The Bureau of Laboratories (BOL) is pleased to offer an online, self-serve, Packaging and Shipping Recertification Course.

This course is designed to meet the needs of those previously certified to package and ship clinical samples who are due for recertification. PACE continuing education credits will be available with this 2-hour course.

This intermediate level course will provide a comprehensive overview of Federal (DOT & USPS), and International (IATA) Regulations applicable to the packaging and shipping of laboratory specimens.

The course will provide an understanding of terminology, packaging, marking, labeling, and documentation required for shipping under these regulations. Successful completion of this course will meet requirements for employer certification.

After course completion, participants will complete an evaluation and a quiz. Successful participants must achieve at least 80% passing score on their quiz, before they will be able to print out their training certificate. The training certificate must be signed by the participant's supervisor in order to be valid. Continuing education credits are available for participants that are ASCP or NCA certified.

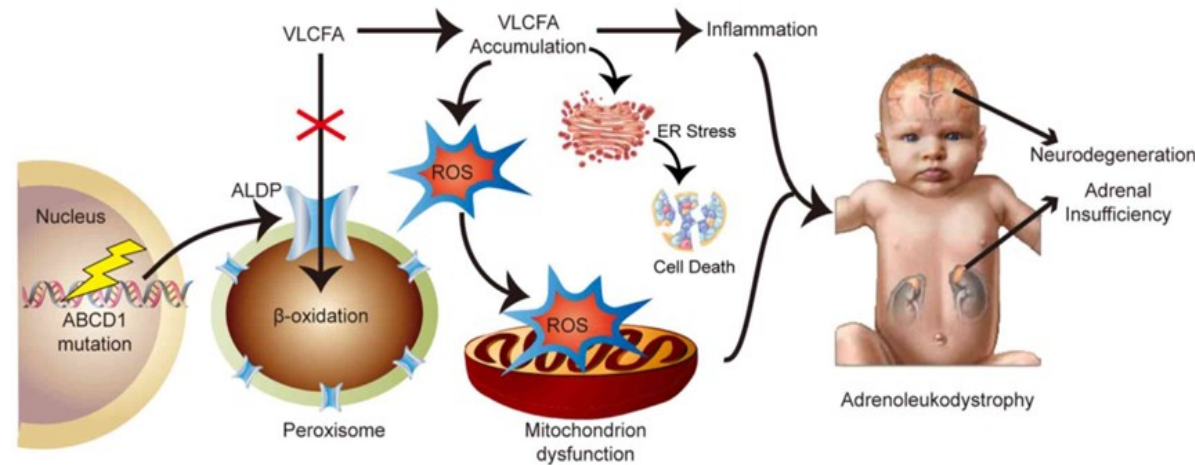
To sign up for this course, access your MITRAIN account and search for course ID 1094582. If you have not previously trained for packaging and shipping certification, please wait to register for a virtual course using course ID 1062236. Virtual courses will be offered in late spring 2021. For questions, please contact Jason Wholehan at 517-335-9653 or by email at wholehanj@michigan.gov



X-linked Adrenoleukodystrophy Newborn Screening Test

Author: Ashley Kelsey

X-linked Adrenoleukodystrophy (X-ALD) is a rare X-linked genetic disorder. There are multiple forms of X-ALD that cause problems with the adrenal glands, brain, and spinal cord. Without treatment, these problems can quickly worsen and cause death during childhood. X-ALD is caused by an ABCD1 gene mutation in the peroxisomal transmembrane ALD protein (ALDP, ABCD1). The β -oxidation of very long chain fatty acids (VLCFA) is impaired in X-ALD patients, leading to their accumulation in the plasma and tissues. This accumulation causes an inflammatory immune response damaging the nerve cell myelin and the cells of the adrenal cortex resulting in neurodegeneration and adrenal insufficiency. Available treatments include cortisol replacement and human stem cell transplant.



The Newborn Screening (NBS) Laboratory started testing for X-ALD in October 2019. Only one of their two Tandem Quadrupole (TQD) Mass Spectrometer (MS/MS) instruments was dedicated to 2nd tier X-ALD testing. It was quickly realized this testing turn around time (TAT) was too slow for finding potential medical emergencies. To improve TAT, NBS developed a plan to transition 2nd tier X-ALD testing from the TQD MS/MS to a newly acquired QSight MS/MS.

Figure 1 shows method comparison data from 542 patients that were run in duplicate over 5 weeks using the TQD and QSight methods. The QSight values were lower than the values tested on the TQD during method comparisons and resulted in different cut-off values. Borderline positive (B+) and strong positive (S+) samples were identified by both methods. The Limit of Detection and precision were improved with QSight.

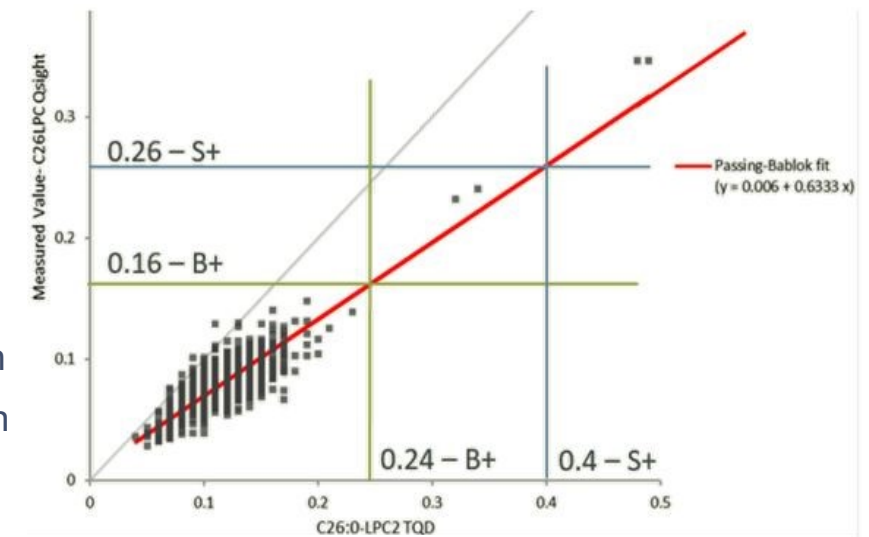


Figure 1

Accuracy was tested with known true positive X-ALD patient samples using QSight and would demonstrate the possibility of false negative results related to the newly established cut-off values.

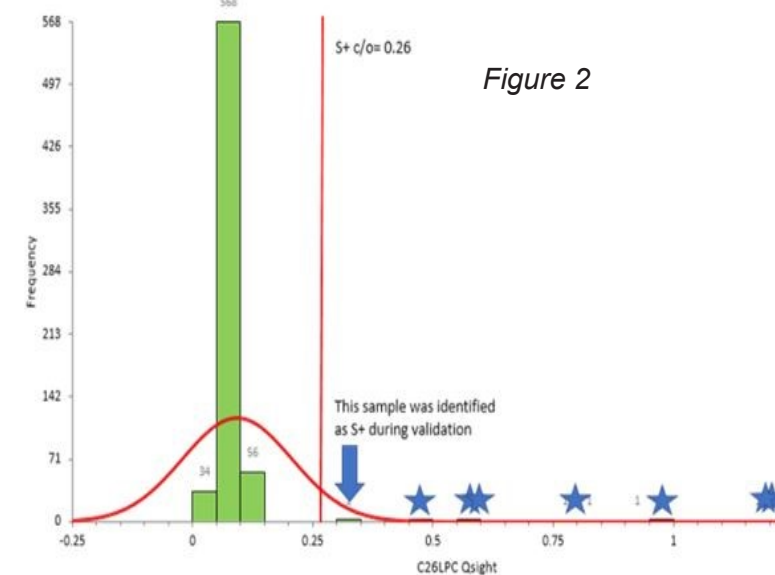


Figure 2

Figure 2 shows that all samples were correctly identified as S+ and were clearly differentiated from the normal population. In addition, QSight was faster than the TQD. The QSight method takes less than 1.5 minutes per sample in comparison with the TQD method that took over 3 minutes per sample.

QSight proved to be a valid and improved method for 2nd tier X-ALD testing and also improved TAT for disorder identification.

Mosquito Vector Arbovirus Surveillance

Author: Diana K. Riner, MS, PhD, and Adam Czubachowski, Virology and Immunology Section

International trade combined with the challenges in global temperatures has allowed mosquitos to travel more freely, making arboviruses (arthropod-borne viruses) a reoccurring issue within public health. Arboviral diseases have long been associated with outbreaks of varying sizes and durations. In 2016, Zika virus was responsible for a worldwide pandemic and was a national concern within the United States. In 2019, Eastern Equine Encephalitis (EEE) virus was responsible for outbreaks in multiple states, including Michigan.

of risks posed by arboviral diseases to various areas of the state. For example, in 2019, 31,995 mosquitos were tested for West Nile virus, resulting in 57 positive mosquito pools out of 1,540. When comparing figures 2 and 3, the positive mosquito pools correlate with subsequent known positive cases in 2019. By identifying the risk areas, targeted mitigation efforts can be introduced, thus, helping to control the chances of transmission and arbovirus disease spread.

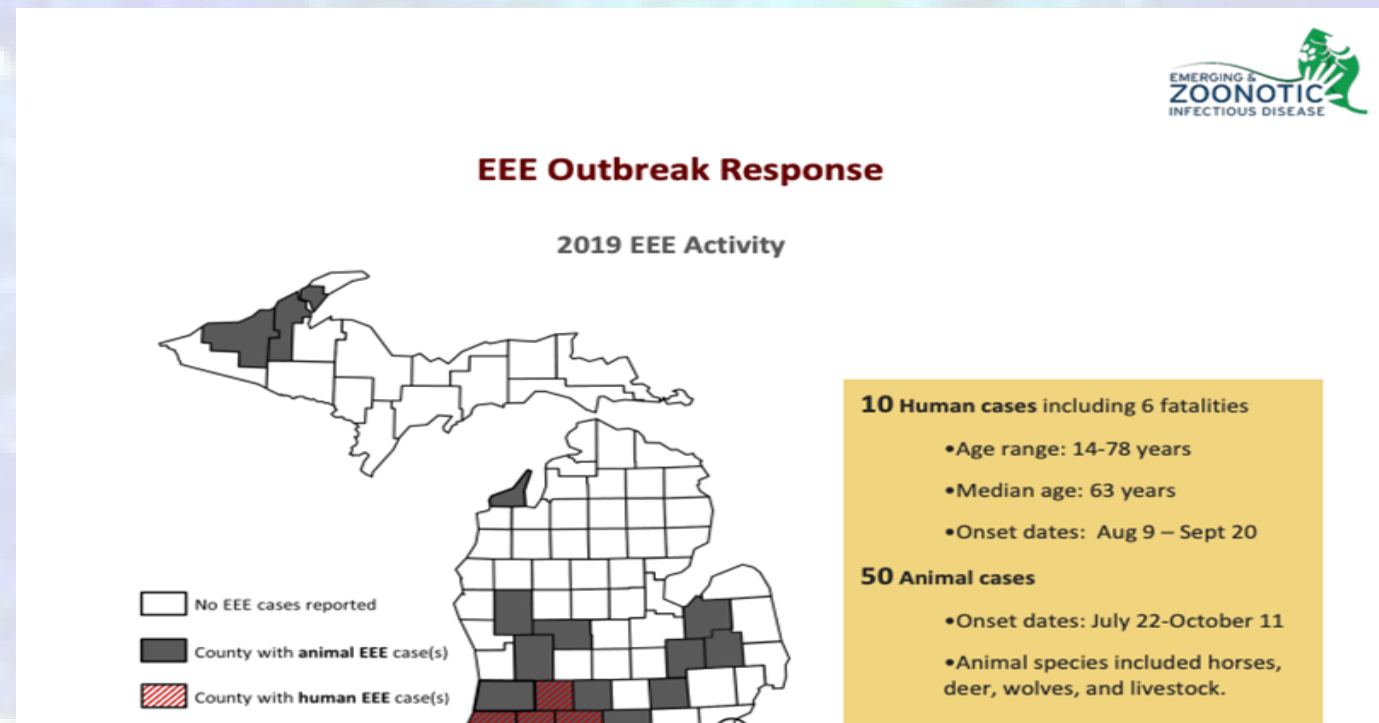


Figure 1: Human and animal cases for EEE in Michigan (2019). Obtained from the 2019 Michigan Emerging and Zoonotic Disease Surveillance Summary. https://www.michigan.gov/documents/emergingdiseases/Final_2019_Annual_Summary_695711_7.pdf

Testing for arboviral diseases in mosquito populations is a critical component of Michigan’s arboviral disease surveillance program. With weather changes from year to year, the risks of outbreaks are becoming increasingly difficult to predict, but an active mosquito surveillance program can provide valuable information and warnings

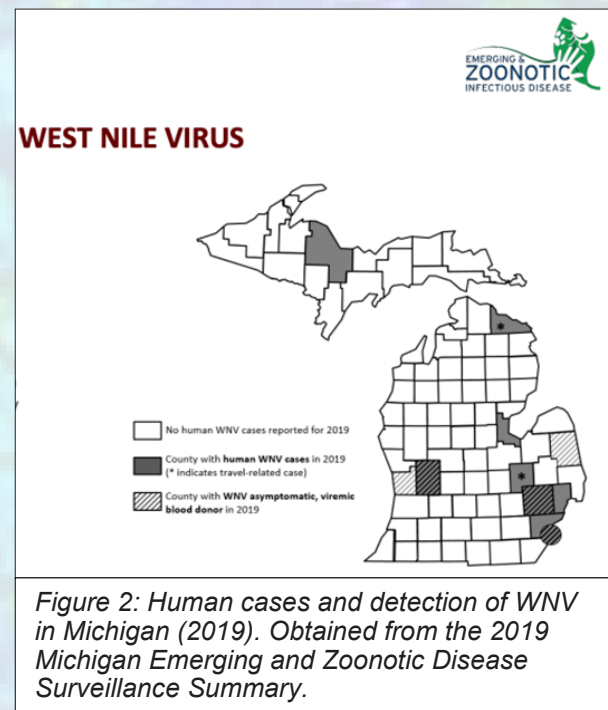


Figure 2: Human cases and detection of WNV in Michigan (2019). Obtained from the 2019 Michigan Emerging and Zoonotic Disease Surveillance Summary.

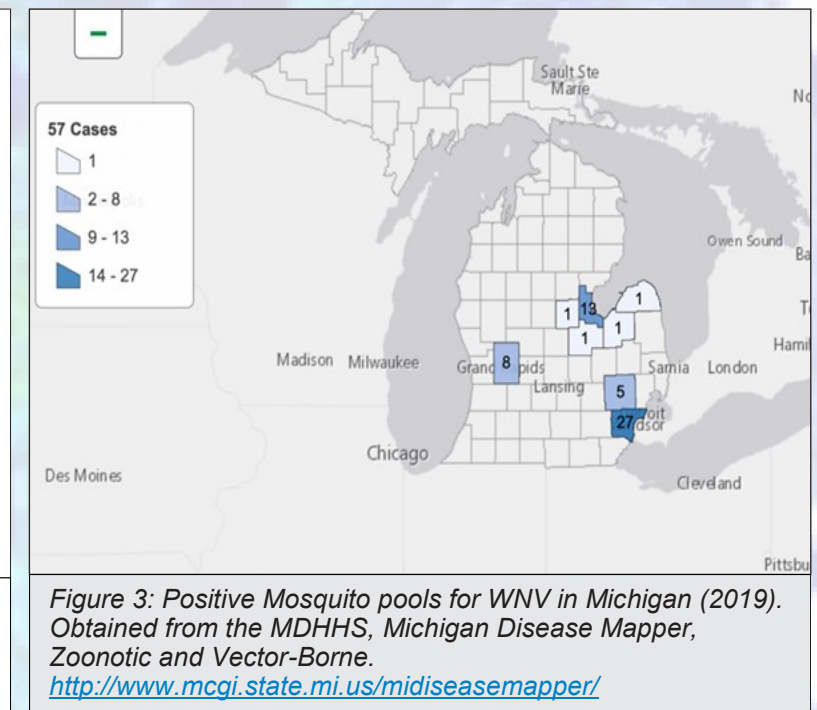


Figure 3: Positive Mosquito pools for WNV in Michigan (2019). Obtained from the MDHHS, Michigan Disease Mapper, Zoonotic and Vector-Borne. <http://www.mcqi.state.mi.us/midiseasemapper/>

Beginning in 2021, MDHHS Bureau of Laboratories (BOL) will begin testing mosquito pools for relevant arboviruses. Mosquito pool surveillance testing for Michigan counties was previously performed at Michigan State University (MSU). Using resources from MSU, the BOL is completing final preparations to begin testing mosquito pools in early May. Mosquitos will be submitted as non-fed females to help reduce any biological interferences. Collection sites will identify the

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Mosquito Vector Arbovirus Surveillance

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mosquito species, and testing will be done in pools no larger than 50. Real-time PCR will be utilized to detect five different arboviruses known to circulate in Michigan, including West Nile Virus (WNV), St. Louis Encephalitis (SLE), La Crosse Virus (LCV), Jamestown Canyon Virus (JCV), and Eastern Equine Encephalitis (EEE).

Test results will be shared with the MDHHS Bureau of Epidemiology's Emerging & Zoonotic Infectious Disease Section along with local health departments and mosquito control districts to help identify any potential areas of risk. This is in effort to reduce the chances of potential outbreaks by identifying positive arbovirus mosquito pools in Michigan counties before they infect humans and animals.



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Editor: Teresa Miller