

## *Mycobacterium tuberculosis*: Diagnostic Principles and Procedures

March 19-22, 2019

Centers for Disease Control | Atlanta, GA



Course # 588-100-19

Co-Sponsored by the Association of Public Health Laboratories in collaboration with the National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Division of Tuberculosis Elimination, and Laboratory Training Team, Division of Laboratory Systems, Center for Surveillance, Epidemiology, and Laboratory Services, Centers for Disease Control and Prevention

### DESCRIPTION

This intermediate-level course will further educate participants on diagnostic *Mycobacterium tuberculosis* complex (MTBC) principles and procedures. Lectures, hands-on laboratory exercises, group discussions, and interactive sessions will be used to increase knowledge. State-of-the-art diagnostic molecular and growth-based methods for detection, isolation, identification (ID), and drug susceptibility testing (DST) of MTBC will be discussed and compared. Attendees will be provided with the tools necessary to determine appropriate safety practices and testing algorithms. Case studies will highlight interesting tuberculosis case results including the importance of accurate result interpretation, collaboration with TB Control Programs and other laboratories, lessons learned, and problem-solving. Attendees are expected to present case studies and to participate in group discussions by describing testing algorithms/methods.

### AUDIENCE

This course is intended for laboratorians with a minimum of one year experience in a laboratory that identifies MTBC and performs detection, isolation, ID, and DST with preference given to laboratorians working in public health laboratories.

### OBJECTIVES

At the conclusion of this program, the participants will be able to:

- Identify important risk assessment and biosafety practices for the mycobacteriology laboratory.
- Compare and contrast test methods for growth-based DST, ID, and molecular detection of MTBC.
- Describe mutations associated with drug resistance for MTBC and common correlations between mutations and growth-based results.
- Perform and interpret real-time PCR for the detection of MTBC.
- Discuss mycobacteriology case studies related to testing algorithms and interpretation of results.
- Explain the importance of assessing local data and quality performance measures for the mycobacteriology laboratory.
- Recognize accepted validation methods and regulatory standards for mycobacteriology testing.
- Describe next generation sequencing and its potential use in the mycobacteriology laboratory.

### CONTINUING EDUCATION

The Association of Public Health Laboratories (APHL) 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 24 contact hours. This course has been approved for 24 contact hours in the category (*Microbiology/Mycology/Parasitology*) for Florida Laboratory Licensees.

### APPLICATION to ATTEND

**Application Deadline: November 30, 2018**

- The preliminary application is to be completed online at <https://www.surveymonkey.com/r/100-19TBApplication>.
- Only completed applications received by the deadline will be considered. Application does not guarantee acceptance.
- If you are unable to complete the application online, email Marisa Barley at [marisa.barley@aphl.org](mailto:marisa.barley@aphl.org) or phone 240.485.3843.
- Public health applicants must have approval from their state or local laboratory director to apply. Students will be selected according to the degree to which the applicant's job description, experience, and responsibilities are consistent with the prerequisites. Priority will be given for one applicant per public health laboratory, with a second person considered on a space available basis.
- Notification of acceptance status will be sent via email after December 14, 2018.
- **Participants are required to bring a case study and testing algorithm from their laboratory to the course to present to course participants. More details to follow with application acceptance.**

### REGISTRATION

- **Registration for this workshop is being offered at No Charge to the participants!**
- Registration and logistical details will be provided upon acceptance into the course.

### TRAVEL

- All travel and logistical details will be provided upon acceptance into the workshop.
- Some states have lengthy travel approval processes so it is important to begin the process as soon as possible. However, DO NOT make any travel arrangements until you are notified of acceptance into the course.
- Participants are responsible for all lodging, meals, and travel costs.
- A group lodging discount is being negotiated at the current federal per diem rate of \$152.00 (plus tax and fees) per night.
- Transportation between the hotel and CDC will be provided.

### SPECIAL NEEDS

In compliance with the Americans with Disabilities Act (ADA), individuals seeking special accommodations should submit their request in writing to Marisa Barley, APHL Customer Support at [marisa.barley@aphl.org](mailto:marisa.barley@aphl.org), at least three weeks prior to the start date of the workshop.

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## PRELIMINARY AGENDA

### Day 1 Tuesday, March 19, 2019

8:00 am Introduction and Course Overview  
8:30 Safety Briefing  
8:40 Pre-Test  
9:00 Tuberculosis Epidemiology in the United States  
9:30 Method Validation and Regulatory Issues  
10:15 Break  
10:30 Split Session A  
Group 1: Safe Biosafety Cabinet Practices  
Group 2: Safety in the TB Laboratory & Risk Assessment  
11:30 Lunch (on your own)  
12:45 pm Split Session B  
Group 1: Safety in the TB Laboratory & Risk Assessment  
Group 2: Safe Biosafety Cabinet Practices  
1:45 Considerations for Specimen Processing and Isolation of MTBC from Culture  
2:45 Break  
3:00 Making the Pieces Fit: Combining Growth-Based and New Mycobacteriology Methods Using a Systems Approach  
3:45 DST Reference Center  
4:00 Results of Demographic Survey  
4:10 Case Studies  
4:40 Adjourn

### Day 2 Wednesday, March 20, 2019

8:00 am NAAT for Direct Detection of TB  
8:30 Mycobacterial Identification  
9:30 Break  
9:45 Considerations for Growth-based Drug Susceptibility Testing  
11:00 Evaluation of MGIT Pyrazinamide Testing  
11:30 Lunch (on your own)  
1:00 pm Monitoring the Performance of Your Laboratory  
1:30 False-Positive and False-Negative Results  
2:15 Break  
2:30 Assessing Local Data  
3:15 Case Studies  
4:30 Adjourn

### Day 3 Thursday, March 21, 2019

8:00 am Introduction to Molecular Biology  
8:30 Detection of *M. tuberculosis* complex & *M. avium* complex by real-time PCR  
9:15 Break  
9:30 Molecular Detection of Drug Resistance  
10:15 Split Session A  
Group 1: Use of real-time PCR Assay for Detection of MTBC  
Group 2: Group Scenarios  
11:15 Lunch (on your own)  
12:45 pm Split Session B  
Group 1: Group Scenarios  
Group 2: Use of real-time PCR Assay for Detection of MTBC  
1:45 Use of Whole Genome Sequencing in Molecular Epidemiology  
2:30 Case Studies  
3:00 Break  
3:15 Interpretation of real-time PCR Assay Results & Algorithm Speed Dating  
4:45 Adjourn

## FACULTY

*Division of Tuberculosis Elimination (DTBE), National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (NCHHSTP), CDC, Atlanta, GA*

### Laboratory Branch, Reference Laboratory Team

- Beverly Metchock, DrPH, D(ABMM), Team Lead
- Kate Klein, MPH, M(ASCP)<sup>CM</sup>, Microbiologist
- David Sikes, BS, MT(ASCP), Microbiologist

### Laboratory Branch, Laboratory Capacity Team

- Stephanie Johnston, MS, Team Lead
- Robert Domaoal, PhD, Laboratory Consultant
- Cortney Stafford, MPH, MT(ASCP), Laboratory Consultant
- Mitchell Yakrus, MS, MPH, Microbiologist
- Monica Youngblood, MPH, M(ASCP), Laboratory Consultant

### Laboratory Branch, Applied Research Team

- Jamie Posey, PhD, Team Lead
- Glenn Morlock, MS, Microbiologist
- Melisa Willby, PhD, Microbiologist

### Laboratory Branch, Systems Group

- Melinda Dunn, PhD, Safety Officer

### Surveillance, Epidemiology, and Outbreak Investigations Branch

- Adam Langer, BS, DVM, MPH, Surveillance Team Lead

### Field Services Branch

- Sapna Bamrah Morris, MD, MBA, Medical Officer

*Office of Laboratory Safety, Office of the Associate Director for Laboratory Science and Safety (OADLSS), CDC, Atlanta, GA*

- Dwayne Lasky, Safety and Occupational Health Manager

## INVITED FACULTY

- Eileen M. Burd, PhD, D(ABMM), Director, Clinical Microbiology, Emory University Hospital, Atlanta, GA
- Jessica Gentry, BA, Supervisor, TB/Serology Laboratory, Indiana State Department of Health Laboratory
- Tanya A. Halse, BS, Supervisor, Molecular Mycobacteriology and Meningitis Laboratories, New York State Department of Health, Wadsworth Center
- Ryan Jepson, M(ASCP), Supervisor, Microbiology, State Hygienic Laboratory at the University of Iowa
- Jan Owen, BS, TB Reference Team Lead, Texas Department of State Health Services

### Day 4 Friday, March 22, 2019

8:00 am Case Studies  
8:40 Post-Test  
9:00 Review Test Responses  
9:15 Break  
9:30 Beyond the Laboratory Walls: Enhancing Your Integrated System  
10:15 Case Studies: Big Picture  
11:45 Evaluation  
12:00 pm Final Question and Answer  
12:15 Adjourn

## NOTE: CDC SECURITY CLEARANCE REQUIREMENTS

**NON-US CITIZENS** - This course will be held at the CDC Roybal campus. Due to CDC requirements for security clearance, all non-US citizens will be asked to provide information needed to obtain clearance, which will only be used for the purposes of attending this course. Detailed instructions will be provided upon acceptance into the course. Please do not make any nonrefundable travel plans until you have received confirmation of acceptance into the course and security clearance approval.

**US CITIZENS** - If you are a US CITIZEN there is no extra clearance process required.

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