



'Medical Laboratory Testing and Technology'

A Four-Hour Accredited Seminar for Clinical Laboratory Techs

Saturday, May 6, 2023 | 9:00am to 2:00pm (ET)

9:00am	PARTICIPANTS LOGIN
9:20am – 9:30am	Welcome and Introductory Remarks
9:30am – 10:30am	<p>“Flow Cytometric Diagnosis of Paroxysmal Nocturnal Hemoglobinuria (PNH)” Amanda Burke, MS, MLS(ASCP)</p> <p>Paroxysmal nocturnal hemoglobinuria or PNH is a rare disease that can be challenging to diagnose due to the wide variety of symptoms that can be attributed to many other disorders. A somatic mutation in the PIGA gene is the most common cause of PNH, which leads to defective GPI-anchored proteins. This causes increased red cell destruction, blood clots, and white cell dysfunction. Flow cytometry is the gold standard for both diagnosis and monitoring of PNH due to its ability to detect the loss of critical GPI-anchored proteins in red and white blood cells. Here we will discuss the diagnosis of PNH and methods of flow cytometric detection of the disease as well as possible pitfalls of diagnosis/monitoring. (Paroxysmal Nocturnal Hemoglobinuria, 2023)</p> <ol style="list-style-type: none">1. Recognize the mechanism of disease for PNH and some distinguishing clinical findings;2. Describe the basic principle of flow cytometric testing;3. Distinguish between a normal patient’s flow immunophenotype and that of PNH; and4. Discuss possible sources of error in PNH detection using flow cytometry.
10:30am – 11:30am	<p>“The Evolution of a Revolution: How Polymerase Chain Reaction (PCR) has Evolved Over the Years” Anthony Huang, MS, MLS(ASCP)</p> <p>Conceived in the 1980s by American biochemist Kary Mullis, Polymerase Chain Reaction (PCR) is one of the most crucial developments in the field of molecular biology. With just a small amount of starting DNA, PCR can amplify a user-defined region using DNA polymerase to make billions of copies. This now-ubiquitous technique has essentially split biology into two eras: before PCR and after PCR. Frequent advancements in PCR have streamlined this technique and allowed it to evolve and inspire many other molecular biology techniques. This lecture explores the inception, transformation, and external applications of PCR.</p> <ol style="list-style-type: none">1. Describe the necessary components for a PCR reaction;2. Identify the differences between first, second, and third generation PCR; and3. Discuss the importance of PCR and its clinical applications.
11:30am	BREAK
12:00pm – 1:00pm	<p>“Advances in Early HIV Detection and Disease Monitoring” Hana Fukuto, PhD, SMB(ASCP)CM</p> <p>There are approximately 1 million people infected with HIV in the United States, out of which more than 10% is unaware of their status. To maintain the patient’s health and to prevent additional spread of the virus, early detection, proper treatment and monitoring of HIV infection is crucial. This webinar will review the advances in the clinical tests that detect the early signs of HIV infection, including those used in the routine diagnosis and blood supply screening (ELISA tests to detect antigens and antibodies, and RT-qPCR tests to detect viral RNA), as well as the rapid tests used at the point-of-care and self-testing. We will discuss the evolution of the tests over the last few decades, the algorithms to minimize false results, and the challenges of implementing wide HIV screening programs to minimize the transmission of the virus. In addition, we will discuss how other molecular-based HIV tests, such as the viral load assays and HIV genotyping, can be used to monitor the effectiveness of anti-HIV therapy and assist in choosing the appropriate therapy for the patients.</p> <ol style="list-style-type: none">1. Summarize the HIV infectious cycle and the key immune responses that are relevant to HIV testing, and explain the concept of the “window period” for viral detection;2. List tests that are used for early detection of HIV infection, including both rapid tests used in point-of-care settings, as well as serological and molecular assays used in the clinical laboratories;3. Describe the tests that measure the amount of virus present in the patient to monitor the effectiveness of therapy; and4. Describe the method that detects drug resistance mutations in HIV and how it can assist in the treatment of the HIV patients.
1:00pm – 2:00pm	<p>“Molecular Tools for Tuberculosis Testing” Gloria Viboud, PhD, SM(ASCP)MB</p> <p>Tuberculosis remains the world’s deadliest infectious disease. More than 20% of the world population is infected, and one third of those never get diagnosed or treated, which leads to the spread of the organism. Multidrug resistant (MDR) and extensively drug-resistant (XDR) TB pose an added challenge to successful TB treatment. TB diagnosis is mainly based on X rays, smear microscopy and bacteriological testing. The long turnaround time of bacterial culture delays diagnosis and increases the risk for drug resistant TB, especially in developing countries. Molecular methods provide an alternative to culture by not only speeding diagnosis but also by detecting genetic traits associated with anti-TB drug resistance. Here, we will review the molecular tools available for TB testing and discuss the advantages and disadvantages of each</p>

method.

1. Describe the WHO-endorsed molecular tests for TB and drug resistance;
2. Discuss emerging technologies under development or evaluation; and
3. Contrast intended use, sensitivity and specificity of each method.

2:00pm

PROGRAM END