

Influenza Genomic Sequencing Workshop

Monday-Friday, October 20-24, 2025

US Centers for Disease Control and Prevention (CDC) | Atlanta, GA

Co-sponsored by APHL and CDC Influenza Division (ID).

DESCRIPTION

This hands-on workshop provides a comprehensive overview of influenza virus sequencing for the laboratorian who works on library preparation at the bench. The workshop combines lectures, laboratory work, and practical bioinformatics training. Participants will learn to implement standardized CDC laboratory protocols for sequencing influenza viruses from respiratory specimens using the Illumina MiSeq or other Illumina platforms.

The course includes instruction on the use of the MIRA bioinformatics pipeline for processing raw sequencing data into high-quality consensus genomes, with a focus on quality control procedures. Additionally, participants will gain experience in basic influenza genome assembly, data curation, sequence analysis, and uploading sequences to public databases. See the next page for a full agenda.

AUDIENCE

This course is intended for public health laboratorians who are currently conducting wet-lab influenza sequencing procedures in their laboratory, using Illumina instrumentation.

Applicants' laboratories should currently have implemented or be establishing sequencing for influenza surveillance in their jurisdiction, with intent and a plan for sustainable continuation of influenza sequencing in future seasons. However, applicants whose laboratories participate as Influenza Sequencing Centers (ISCs) or National Influenza References Centers (NIRCs) will NOT be accepted for this workshop. PLEASE NOTE there is no federal funding support expressly provided or implied beyond this workshop for influenza sequencing by applicants' laboratories.

OBJECTIVES

After completing this workshop the participant will be able to:

- Perform influenza sequencing from respiratory specimens using standardized CDC protocols with Illumina sequencing instrumentation.
- Apply the MIRA bioinformatics pipeline to process raw sequencing reads into consensus genomes.
- Understand key aspects of quality control in sequence data curation and analysis.

ACCESSIBILITY

In compliance with the Americans with Disabilities Act, individuals seeking special accommodations must email a request to (Susan.Trow@aphl.org) at least three weeks prior to the workshop's start date.

APPLICATION TO ATTEND

APPLY NOW!

Application Closes: **July 9, 2025 | 11:59 pm ET**

Only completed applications received by the deadline will be considered. Application does not guarantee acceptance. Public health applicants must have approval from their Laboratory Director to apply. Applicants 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 July 18, 2025.

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. P.A.C.E.® is accepted by all licensure states except Florida. This learning activity will provide contact hours for the participant who successfully completes this training.

Level of Instruction:

INTERMEDIATE: Refresher course; some basic knowledge is required; for the experienced staff technologist with some years of experience.

TRAVEL

- Applicants selected for participation will receive full sponsorship of their travel expenses, including transportation, lodging and per diem.
- 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 notified of acceptance and provided instructions to do so.

QUESTIONS?

Please email fluquestions@aphl.org

By registering for this event, you are consenting to have your information shared with APHL event collaborators, such as the Centers for Disease Control and Prevention and Public Health Laboratories. We will not, in any circumstances, share your information with other individuals or organizations without your permission, including corporations or individuals, except when applicable by law. We do not sell, communicate or divulge your information to any mailing lists.

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PRELIMINARY AGENDA

Day 1 | Monday October 20

9:00 am Registration and Pre-test
 9:30 am Welcome, Introductions, Overview
 10:30 am **Lecture:** Influenza A and B Genetic Sequencing Overview
 11:30 pm Lunch
 12:30 pm **Lecture:** Sample Selection Criteria
 2:00 pm **Laboratory:** MRT-PCR Set-Up for Influenza A and B Viruses
 4:00 pm Adjourn

Day 2 | Tuesday October 21

9:30 am **Practical:** GISAIID Account Setup Check
 9:45 am **Laboratory:** Exo I Purification of MRT-PCR, QC with QIAxcel, Illumina DNA Prep (Tagmentation and Clean Up)
 12:00 pm Lunch
 1:00 pm **Laboratory:** Illumina DNA Prep (Amplification and clean up), Pooling of Libraries, QC-Quantification and QIAxcel, Prepare Samples of Loading of the MiSeq, MiSeq loading
 4:00 pm Adjourn

Day 3 | Wednesday October 22

9:30 am **Lecture:** Principles of Viral Genome Assembly
 10:30 am **Lecture:** Buying Time: Sequencing and its Invaluable Effect on Influenza Surveillance and Vaccines
 11:15 am **Lecture:** Principles of Phylogenetics
 12:00 pm Lunch

1:00 pm **Practical:** MIRA
 2:30 pm **Laboratory:** MRT-PCR Set-up for Influenza A and B Viruses
 4:00 pm Adjourn

Day 4 | Thursday October 23

9:30 am **Laboratory:** Exo I Purification of MRT-PCR QC with QIAxcel, Illumina DNA Prep (Tagmentation and clean up)
 12:00 pm Lunch
 1:00 pm **Laboratory:** Illumina DNA Prep (Amplification and Clean Up), Pooling of Libraries, QC-Quantification and QIAxcel, Prepare Samples for Loading of the MiSeq, MiSeq loading
 4:00 pm Adjourn

Day 5 | Friday October 24

9:00 am **Lecture:** Raw data, Metadata, and Analytics: Formulating Laboratory Data Plan, Mandatory Data Elements Required for Genomic Surveillance
 10:00am **Practical:** Influenza data assembly, curation, and analysis: Moving raw data into WSL, Naming and selecting runs in MIRA, Starting Genome Assembly and Annotation, Understanding MIRA QC and segment-level metrics
 11:30 pm Lunch
 12:30 pm **Practical:** Phylogenetics with NextClade
 1:45 pm **Practical:** Influenza Data Assembly, Curation, and Analysis (Continued): Using NextClade to identify Influenza clades, Compare Amino Acid mutations against vaccine strain
 2:15 pm Post-Test, Wrap Up and Next Steps
 3:00 pm Adjourn

FACULTY

Virology, Surveillance, and Diagnosis Branch (VSDB), Influenza Division (ID), National Center for Infectious Respiratory Diseases (NCRID), CDC.

- Juliana DaSilva, Biologist, Genomics and Diagnostics Team
- Julia Frederick, Biologist, Genomics and Diagnostics Team
- Lisa Keong, Biologist, Genomics and Diagnostics Team
- Marie Kirby, PhD, Team Lead, Genomics and Diagnostics Team
- Ben Rambo-Martin, PhD, Team Lead, Bioinformatics Infrastructure Activity
- Malania Wilson, Biologist, Genomics and Diagnostics Team

SECURITY CLEARANCE REQUIREMENTS

NON-US CITIZENS — This course will be held on 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. Detailed instructions will be provided upon acceptance into the course. Please do not make any non-refundable travel plans until you have received confirmation of acceptance into the course and security clearance approval. The information you provide will only be used for the purposes of attending this course.

US CITIZENS - If you are a US citizen, there is no extra clearance process required