

PPCDL Workshop Descriptions –updated for 2024 workshop season

Attendance policy:

Participants must be present for the entire workshop, whether provided virtually or in-person. If you cannot attend every day and for all sessions, please plan to take the workshop at another time. Participants must complete all assigned homework, tests and hands-on activities during the time period indicated, to receive a certificate of course completion.

If an emergency situation arises, the participant is asked to notify the workshop coordinators as quickly as possible. Also, if you are on-site for a workshop, please notify one of the instructors and a fellow participant so your absence does not cause concern.

For in-person workshops, be sure to give yourself at least 3 hours of time from workshop completion to your outgoing flight time.

Best Laboratory Practices Workshop

The Best Laboratory Practices Workshop and quality management systems workshop is being offered for the first time in 2023. The workshop was held virtually in the first year and now is offered online. This workshop is a prerequisite for all other PPCDL Workshops. The quality management portion of the lecture discusses quality management systems vs ISO 17025 accreditation and the importance of record management in all aspects of quality management. The good laboratory practices portion of the lecture discusses aseptic technique, preventing contamination and general recommendations for working in a laboratory.

Bioinformatics of Sanger Sequencing Workshop-aka Bioinformatics Module SS

The Bioinformatics Module SS workshop is taught over 3-days and has both lecture and hands-on activities. The lectures will cover a range of sanger sequencing topics from primer design to introductory sequence analysis, as well as the molecular classification and diagnostics of a wide range of pathogens including bacteria, fungi, nematodes, Phytoplasmas, viruses and *Phytophthora* species. The hands-on portion of the workshop allows participants to analyze provided sequence data and use various bioinformatic tools for detection and diagnosis of plant pathogens. Participants also may analyze their own Sanger sequence data.

In recent years, this workshop has been presented using a virtual delivery format. Participants must have access to a computer. Presentation slides are text heavy, therefore, phones and tablets are not recommended. Participants must have access to Geneious prime software for the activities. Trial versions and monthly rental may be available if your institution does not own a license.

Bioinformatics of High Throughput Sequencing Workshop-aka Bioinformatics Module HTS

The Bioinformatics Module HTS workshop will be taught slightly differently in 2024. It will include a half-day session taught virtually, followed by a 3-day hands-on, in-person session. The virtual session will provide lectures that cover a range of high throughput sequencing technologies, analysis tools, applications in plant pathogen diagnostics and data analysis pipelines. The hands-on, in-person session allows participants to analyze example datasets using various open-source sequence analysis software publicly available on the Galaxy server for genome assembly and detection of plant pathogens.

The virtual session requires access to a computer. Presentation slides are text heavy, therefore, phones and tablets are not recommended. Participants must have access to the Galaxy server for activities. In the past no-cost versions of Galaxy have been available.

Experiential Bioinformatics of High Throughput Sequencing Workshop-aka Bioinformatics Module EHTS 102

The Experiential Bioinformatics Workshop Module EHTS 102 Workshop is a 3-day, primarily hands-on based training that familiarizes participants with the latest in HTS technologies and analysis tools. The workshop is restricted to a small group of up to 5 participants. The participants will generate their own MinION sequence data and analyze it using various sequence analysis software for detection and diagnosis of plant pathogens.

Participants **must** have completed the core NPDN Bioinformatics of HTS training and should be proficient in plant DNA/RNA extraction, PCR, and other molecular biology techniques.

Citrus Canker Molecular Detection Workshop

The Citrus Canker Molecular Detection Workshop is a 2-day workshop that includes lectures and hands-on components. The lectures will cover the disease characteristics and an overview of citrus canker diagnostic testing at the USDA-APHIS-PPQ S&T Plant Pathogen Confirmatory Diagnostics Laboratory (PPCDL). The hands-on portion of the training focuses on sample preparation, screening diagnostics and interpretation of results.

Citrus Health Workshop - NEW for 2024!

The Citrus Health Workshop is 3-day, in-person workshop that covers three harmful citrus diseases; citrus canker, Huanglongbing (HLB) aka citrus greening and citrus black spot (CBS). Lectures will provide background, disease characteristics and an overview of diagnostic testing at the USDA-APHIS-PPQ S&T Plant Confirmatory Diagnostics Laboratory (PPCDL) for each disease. The hands-on laboratory component will focus on sample preparation, screening diagnostics and interpretation of results.

ELISA Proficiency Preparation Workshop - NEW for 2024!

The ELISA Proficiency Preparation Workshop is a 2-day, in-person workshop and is the first type of workshop developed to support the new methods-based proficiency testing program. It will cover every step of the ELISA testing procedures using commercially available kits. It will discuss processing of various sample types, sample flow, GLP, results interpretation, equipment, and suggestion for high-throughput workflow. It will be a combination of lectures, discussions, and hands-on training.

Isothermal Amplification Workshop

The isothermal amplification workshop is an in-person workshop that includes lectures and hands-on components. The lecture will covers isothermal amplification technologies and assay design. The hands-on portion of the workshop includes nucleic acid extraction and loop-mediated isothermal amplification (LAMP) or recombinase polymerase amplification (RPA) targeting select bacterial and fungal pathogens. Pathogens covered include citrus black spot (*Guignardia citricarpa*), citrus greening ('*Candidatus Liberibacter asiaticus*'), and ash dieback (*Hymenoscyphus fraxineus*)

Phytophthora 101 Workshop

The Phytophthora 101 Workshop is a 3-day workshop that has lectures and hands-on components. The lectures include a review of *Phytophthora ramorum*, DNA extraction, the real-time PCR protocols

using *P. ramorum* (ITS and Elicitin) and *Phytophthora kernoviae* (ITS1 and ITS2) as the targets, and interpretation of results. Each day will consist of a combination of lecture, lab activities, and discussion of participant results, troubleshooting, and good lab practices to obtain optimal results.

The Phytophthora 101 Workshop is one of the most requested workshops we offer. The workshops often fill the available spaces very quickly and we often have a waitlist.

Phytoplasmas Molecular Detection Workshop

The Phytoplasmas Molecular Detection Workshop is a 2-day workshop that has lectures and hands-on components. The lectures include an introduction to phytoplasmas, their taxonomy and the disease symptoms associated with some of these bacterial pathogens of interest to APHIS PPQ. The hands-on portion of the training will focus on available phytoplasmas infected samples (e.g., Poinsettia and Pine) and cover sample preparation, DNA extraction/purification, conventional and real-time PCR procedures, and interpretation of results.

Production and Validation of Diagnostic Assay Controls Workshop – NEW for 2024

The Production and Validation of Diagnostic Assay Controls Workshop is a virtual training that will be no more than a ½ day session. The lecture will cover the need and benefit of using validated assay controls, the types of the controls and their production, validation schemes to evaluate homogeneity and stability, and how to maintain and document traceability.

Real-time PCR Basics Workshop

The TaqMan probe Real-time PCR Basics Workshop is a virtual workshop. The lecture introduces the basic principle of TaqMan Probe Real-time PCR, knowledge about the instruments, assay design / development, and method validation. It also includes applying the knowledge in problem solving, examples of PPCDL practices such as methods for detection of HLB (aka. citrus greening), “*Candidatus*” *Liberibacter asiaticus*; citrus variegated chlorosis, *Xylella fastidiosa* CVC strains; and bacterial blight of rice, *Xanthomonas oryzae* pv. *oryzae* vs. *X. oryzae* USA strains.

Seed Pathogen Testing Workshop on CGMMV, ToBRFV, Popsi

The Seed Pathogen Testing Workshop is a 2-day workshop that has lectures and hands-on components. The lectures include seedborne diseases of cucurbits and solanaceous crops and the detection of their pathogens with focus on viruses and pospiviroids, and the principles of seed nucleic acid extraction. The hands-on portion of the training will focus on CGMMV diagnostics and cover sample preparation, ELISA and PCR procedures and interpretation of results. There will be demonstrations of manual (using simple tools) and robotic (using a KingFisher) high throughput seed nucleic extraction processes.