PLANT PATHOGENESIS
16:765:538 (3 credits)
Spring semester 2017
Foran Hall Room 138B, Tuesdays and Fridays 3:55-5:15pm

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TOPICS: Plant Pathogenesis is intended to expose students to the fundamental aspects of fungal, bacterial and viral pathogenesis and interactions that occur between pathogens and the host plant at the genetic and biochemical levels. The course is designed to provide the students with basic information about plant pathogen interactions, at the same time review key papers and recent developments in the field to expose them to novel discoveries and the state-of the-art methods used to study plant-pathogen interactions. This course is designed to teach students how to write and evaluate research papers. In addition, each student will write a grant proposal, which will be evaluated by a panel review by the students in the class. The topics that will be covered include the following:

Programmed cell death and host defense response
Viral pathogenesis/post-transcriptional gene silencing
Viral suppressors of gene silencing
RNA interference/micro RNAs
Bacterial effectors/immunity/MAMPs
Bacterial resistance mechanisms
Fungal systematics
Fungal effectors/immunity
Fungal resistance mechanisms
Systemic acquired resistance
Mycotoxins
Endoplasmic reticulum stress and its related signaling in plant-pathogen interactions
Functional genomics of plant-pathogen interactions
Chemical genomic approaches
Plant microbiome

There is no assigned text for the course but supplemental reading materials, which consist of review articles and key papers published in the field. Lectures will be presented at the beginning of each topic and will be followed by assigned papers presented by students.

Students will be required to read the assigned papers in advance and bring a written question about each manuscript to class. They will be evaluated based on their class presentations, their participation in the discussion, the grant proposal they will write about one of the topics discussed in class and the two quizzes.

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Jan 17: Introduction/Class organization (Tumer)

Jan 20: SAR, MAMP and PAMP-Host Immunity lecture (Lam)

Jan 24: SAR, MAMP and PAMP-Host Immunity paper review (Lam)

Jan 27: Programmed cell death and ER stress lecture (Lam)

Jan 31: Programmed cell death and ER stress manuscript review (Lam)

Feb 3: Function and genomics in plant defense lecture (Lam)

Feb 7: Function and genomics in plant defense manuscript review (Lam)

Feb 10: Plant microbiome: structural characterization and impacts on plant health lecture (Lam)

Feb 14: Plant microbiome: structural characterization and impacts on plant health manuscript review (Lam)

Feb 17: Host/Fungus interactions lecture (Tumer)

Feb 21: Mycotoxins and plant disease resistance lecture (Tumer)

Feb 24: Host/Fungus interactions/mycotoxins manuscript review (Tumer)

Feb 28: Quiz 1

March 3: Fungal systematics and pathogenesis Lecture (Ning Zhang/Jing Luo)

March 7: Fungal systematics and pathogenesis paper review (Ning Zhang/ Jing Luo)
Proposals are due

March 10: Chemical genomic approaches/activation tagging lecture (McLaughlin)

March 14: Spring break

March 17: Spring break

March 21: **Chemical genomic approaches/activation tagging manuscript review (McLaughlin)**

March 24: **Proposal review (Lam)**

March 28: **Proposal review (Lam)**

March 31: **Multi-omics technology to dissect host-microbiome interactions lecture (Liping Zhao/Tumer)**

April 4: **Virus/host interactions/ posttranscriptional gene silencing lecture (Tumer)**

April 7: **Host induced gene silencing lecture (McLaughlin)**

April 11: **Host induced gene silencing manuscript review (McLaughlin)**

April 14: **TAL effectors lecture (Tumer)**

April 18: **Virus/host interactions/ posttranscriptional gene silencing/TAL effectors manuscript review (Tumer)**

Revised proposals are due

April 21: **Quiz 2**

April 25: **Proposal review (Tumer)**

April 28: **Proposal review (Tumer)**