

## **PPA 673: Advanced Plant Disease Resistance**

**Semesters taught:** Every fall.

**Credit hours:** 1

**Prerequisites:** PPA 400G, PPA 500, PPA 600

**Requirement:** Option to fulfill the requirement for two courses in Advanced Plant Pathology

**Organizer and Instructor:** Pradeep Kachroo

**Major Teaching Objectives:** Give student an in-depth understanding of the interaction between host and pathogen. Emphasis is on the host defense signaling.

**Readings:** At least 1 week before each lecture, students will be assigned one review paper and one recent research paper for that lecture.

**Lecture formats:** Each lecture will begin with a brief overview of the topic, and will conclude with a 15-20 minute critical discussion of the research paper.

Students will be assigned to lead the discussions of research papers.

### **Topics:**

Lecture 1	Genetic analysis of plant disease interactions Gene for Gene interaction
Lecture 2	Mapping, map based cloning of genes,
Lecture 3	R gene structure and function
Lecture 4	Hypersensitive response, Lesion mimics
Lecture 5	Downstream signaling, signal transduction
Lecture 6	Signaling and disease resistance
Lecture 6	SA and disease resistance
Lecture 7	JA/ethylene and disease resistance
Lecture 8	<b>Midterm exam</b>
Lecture 9	FA signaling and disease resistance
Lecture 10	NO and disease resistance
Lecture 11	Cross talk and comparison of R signaling pathways against virus, bacterial, oomycete and fungal pathogens
Lecture 12	Virus-induced gene silencing
Lecture 13	Virus-induced gene silencing
Lecture 14	Resistance via tolerance

### **Assignments, Exams and Grades:**

Participation: 40 pts

Midterm exam: 30 pts

Final exam: 30 pts

Grades: 90-100%, A; 80-89%, B; 70-79%, C; <70%, D