

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:

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| 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 | Midterm exam |
| 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