

Plant Pathology 5103/8103
Molecular Plant-Microbe Interactions
Spring Semester 2015

Course schedule & location: Tu, Th 10:15 – 11:30 (3 credits) — 491 Borlaug Hall

Course instructors:

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Office hours & location: By appointment.

Course description:

Molecular Plant-Microbe Interactions (MPMI) is dedicated to the study of the molecular mechanisms responsible for and resulting from the interactions between plants and microbes. Both positive and negative interactions will be considered. As appropriate, molecular methodologies useful for the study of plant-microbe interactions will be discussed. Specific topics to be covered in this course include preformed barriers and induced plant responses that limit plant-microbe interactions, plant endophytes, interactions between plant hosts and mycorrhizae, systemic acquired resistance, signal transduction, plant disease resistance genes (“R” genes), microbial effector biology, and strategies of using both systemic acquired resistance and R genes for crop protection.

Prerequisites:

Students enrolled in Molecular Plant-Microbe Interactions are expected to have a working knowledge of the plant sciences and basic molecular biology and biochemistry, including an understanding of the basic principles of PCR, DNA sequence analysis, etc. Students who have completed one introductory course in plant pathology, plant biology, or microbiology, an introductory course in genetics, and an introductory course in molecular biology or genomics are likely to be well prepared for this course. Consult with the course instructors if you are concerned about your familiarity and training in prerequisite areas.

Course goals:

Students registered in Molecular Plant-Microbe Interactions will learn what kinds of questions researchers are asking and what tools and strategies are employed to answer them, and acquire both a historic and a contemporary view of research in the realm of molecular plant-microbe interactions. At the end of the semester, students completing

Molecular Plant-Microbe Interactions will be able to read scientific literature in the field with a critical eye and be able to put modern research into a broad perspective. Additionally, students enrolled in either PIPa 5103 or PIPa 8103 will demonstrate their independent abilities by identifying, researching, and developing and presenting a scientific poster about a specific topic in the field. PIPa 8103 students will also lead a class discussion on their chosen topic.

Expectations & classroom conduct:

Molecular Plant-Microbe Interactions will combine both a traditional lecture format and class-led discussions. Lectures will focus predominantly on research topics and methodologies, providing a firm understanding at the molecular level. Group discussions will analyze current research articles that utilize molecular methods and contribute to the scientific community's understanding of plant-microbe interactions. Guest lectures may follow other formats. The classroom will operate in an informal manner and each individual is encouraged and expected to participate fully. Each student is expected to attend and participate in each scheduled course meeting. Assigned course readings must be completed before each class period. Participation will include asking questions as needed, providing feedback to instructor or student led discussions, completing written assignments related to assigned readings, and providing leadership in discussions of particular figures, tables, etc. associated with assigned readings.

During the semester each student will research a relevant topic of interest and develop an associated scientific poster. Towards the end of the semester, each student will be given 5 minutes to present his/her poster in a public forum (See below for complete assignment details and deadlines). Additionally, each PIPa 8103 student will lead a classroom discussion based on her/his selected poster topic.

The instructors of PIPa 5103/8103 reserve the right to modify course structure, schedule, or assignments at any time during the semester as required.

Student Diversity: Students enrolled in PIPa 5103/8103 are expected to conduct themselves in a respectful, professional manner at all times. Dissention and differences of opinion relevant to the content of this course are fair topics of discussion. At no time should any student or instructor be made to feel inferior or intimidated for any reason. The University of Minnesota nondiscrimination policy will be observed at all times.

Accommodations for Students with Disabilities: Students with any type of disability will be accommodated. For assistance, please contact University Disability Services (624-4037) or the course instructors.

Reading materials:

There is no textbook for PIPa 5103/8103. Each student will be provided with references and/or electronic or printed journal articles for all assigned readings. Students will also be supplied with references for supplemental (i.e., suggested, not required) readings. All assigned reading materials are available to students free of charge through the University of Minnesota Library System (www.lib.umn.edu) or may be photocopied from journals

housed in the UM Plant Pathology or Magrath Libraries. Access to pdf files through the UM Library System requires authentication (UM username and password) and Adobe Acrobat Reader software (available free of charge at: get.adobe.com/reader/#reader)

If you need assistance accessing the UM Library System or locating required readings, please contact the course instructors. Please plan ahead! Difficulties downloading or printing files are NOT acceptable excuses for coming to class unprepared. The course instructor and contributing instructors reserve the right to assign additional readings.

Technology enhancement:

- The instructors will upload pdf files of all course handouts and readings in moodle website.
- The moodle website also includes links to online tutorials designed as a review of basic molecular biology principles.
- The course instructors will make periodic announcements via email or post messages in the moodle website. Please check your UM email account and the course site regularly.

Grading:

Grading will be done on an A-F basis according to the following scale:

93-100% A
90-92.9% A-

87-89.9% B+
83-86.9% B
80-82.9% B-

70-79.9% C
60-69.9% D
<60% F

The University of Minnesota defines the following letter grades:

A -- achievement that is outstanding relative to the level necessary to meet course requirements.

B -- achievement that is significantly above the level necessary to meet course requirements.

C -- achievement that meets the course requirements in every respect.

D -- achievement that is worthy of credit even though it fails to meet fully the course requirements.

F -- Represents failure and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructors and the student that the student would be awarded an I (incomplete).

Students enrolled in PIPa 8103: Students enrolled in Molecular Plant-Microbe Interactions as 8103 will be required to lead a class discussion during a regularly scheduled MPMI class period. The lecture will review a contemporary piece of research in the realm of molecular plant-microbe interactions and related to the poster's topic. Individual topics will be developed in consultation with the course instructors and all topics are subject to final approval by the course instructors. In addition to explaining technical details, the student will indicate what kinds of research questions are being asked and provide/explain examples from contemporary publications. The format for this discussion will be similar to that used by the course instructors throughout the semester. Students will be given substantial guidance in the development of her or his lecture. Seminar dates will be assigned at the discretion of the course instructors. Students are required to submit proposed topic and proposed reference materials (journal articles, website addresses, etc.), and lecture outline in writing.

Individual grades for students enrolled in **PIPa 5103** will be based on the following:

- **Participation and preparedness* 25%**
- **Writing assignments 40%**
- **Poster assignment 35%**

Topic (due date:02.26.15)	5%
Outline (due date: 04.02.15)	5%
Abstract and poster draft (due date:04.16.15)	10%
Provide peer-review to one poster (TBD)	5%
Poster presentation (05.06.15)	<u>10%</u>
Total	35%

Individual grades for students enrolled in **PIPa 8103** will be based on the following:

- **Participation and preparedness* 25%**
- **Writing assignments 30%**
- **Discussion leader assignment 20%**
- **Poster assignment 25%**

Topic (due date: 02.26.15)	2%
Outline (due date: 04.02.15)	2%
Abstract and poster draft (due date: 04.16.15)	10%
Provide peer-review to one poster (TBD)	1%
Poster presentation (05.06.2015)	<u>10%</u>
Total	25%

*Note on participation and preparedness: Students enrolled in Molecular Plant-Microbe Interactions are expected to demonstrate a firm understanding of genomics methodologies, strategies, and research, and to acquire and demonstrate the professional vocabulary of the field. Towards these goals, students are expected to come to each class period prepared to discuss and analyze assigned readings. Students will be asked on a routine basis to explain figures, tables, etc. from assigned readings and to discuss

methodologies, research strategies, and conclusions of assigned readings.

Policy on Late Assignments, Make-up Exams:

Students are expected to complete assignments and exams at the scheduled times. Except in the case of extenuating circumstances, at the discretion of the course instructors a single two day extension on course assignments may be allowed at a penalty of 15% of the final assignment grade. Assignments will not be accepted beyond the two day extension. Extenuating circumstances will be evaluated by the course instructors on an individual basis.

Statement on Academic Integrity and Plagiarism:

Academic integrity is essential to a positive teaching and learning environment. All students enrolled in University courses are expected to complete coursework responsibilities with fairness and honesty. Failure to do so by seeking unfair advantage over others or misrepresenting someone else's work as your own, can result in disciplinary action. The University Student Conduct Code defines scholastic dishonesty as follows:

SCHOLASTIC DISHONESTY: submission of false records of academic achievement; cheating on assignments or examinations; plagiarizing; altering, forging, or misusing a University academic record; taking, acquiring, or using test materials without faculty permission; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement.

Within this course, a student responsible for scholastic dishonesty can be assigned a penalty up to an including an "F" for the course. If you have any questions regarding the expectations for a specific assignment or exam, please ask the course instructor. Additional information is available at: http://www1.umn.edu/regents/policies/academic/Student_Conduct_Code.html

Information on plagiarism and guidelines to avoid plagiarism can be found at: <http://writing.umn.edu/tww/preventing/>

Grade Disputes:

All grade disputes should be submitted in writing to the course instructors within one week of receiving the grade. The instructors and the student will then meet to discuss the grade in question and will seek a resolution of the matter. If the dispute is not resolved to the student's satisfaction, external input from additional UM faculty will be sought.

Senate Student Academic Workload Policy:

For undergraduate courses, one credit is defined as equivalent to an average of three hours of learning effort per week (over a full semester) necessary for an average student to achieve an average grade in the course. For example, a student taking a three credit course that meets for three hours a week should expect to spend an additional six hours a week on coursework outside the classroom.