

## ***Syllabus for***

# **PLPA 509/MCB 511: Molecular Biology of Plant- Microbe Interactions**

**(3 credit hours; CRN# 48290/49807)**

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**Office hours:** by appointment

## **General Information:**

**Lecture Schedule:** Tuesdays and Thursdays 3:30 – 4:50 pm

**Place:** Turner Hall W9

- I. **COURSE DESCRIPTION:** This course is designed to cover the most **advanced** knowledge of host pathogen interactions and to confer an understanding of the **molecular mechanisms** underlying the **communication** between plants and their microbial pathogens. The topics covered are arranged to follow the sequences of events during the host-pathogen interactions. These will begin with penetration, infection, establishment and plant response. The emphasis is at the molecular level on both microbial and plant genes involved in the interactions, their functions, regulations and signal transduction pathways.
- II. **OBJECTIVES:** The overall objective of the course is to acquaint the student with the **complexity** of the host-pathogen interactions. Specifically, 1) to present a **conceptual framework** of host-microbe interactions; 2) to examine selected examples of current research on host-pathogen interactions; 3) to be familiar with **critical concepts** and scientific literatures; and 4) to foster understanding of the cellular, molecular and genomic aspects of host-pathogen interactions.
- III. **TEXT AND SUPPLEMENTAL READING:** There is no assigned textbook for this course. Current reviews or original journal articles will be assigned most weeks. Changes or other assignments may occur during the course. You are expected to read these papers and will be responsible for them on the tests/presentations.
- IV. **EXAMS:** The purpose of the class exams is to determine basic competency. These written exams will cover the information in the lectures and assigned readings. There will be three exams. We might also have quiz before lectures.

V. **ATTENDANCE:** Students are expected to attend class regularly, keep up with assigned readings, and contribute to class discussions.

VI. **STUDENT PRESENTATION:** Each student is expected to make a comprehensive presentation (30 min) on a subject suggested by the teaching staff based on literature research on a current hot topic related to host pathogen interactions. The student will identify relevant current literature, provide an outline of the presentation, indicate how the key literature fits the outline, compose the final draft of the presentation, and finally present in class for students and instructor evaluations. Please be critical in presenting data. It is very beneficial if you distribute an outline to be presented to the instructors and your fellow students.

VII. **GRADING:**

Exam I	100
Exam II	100
Exam III	100
Quiz and discussion	100
Student presentation	150
Total	550

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The grading policy will be as follows (averages will be rounded up to nearest whole number):

97-100%	A+
93-96%	A
90-92%	A-
87-89%	B+
83-86%	B
78-82%	B-
65-77%	C
55-64%	D

**NOTE:** University regulations and policies will be followed about **penalties for cheating or plagiarism** for the course.

### **Academic Integrity**

The University of Illinois at Urbana-Champaign *Student Code* should also be considered as a part of this syllabus. Students should pay particular attention to Article 1, Part 4: Academic Integrity. Read the Code at the following URL: <http://studentcode.illinois.edu/> .

Academic dishonesty may result in a failing grade. Every student is expected to review and abide by the Academic Integrity Policy: <http://studentcode.illinois.edu/>. Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask the instructor(s) if you are ever in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

### **Students with Disabilities**

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor as soon as possible. To insure that disability-related concerns are properly addressed from the beginning, students with disabilities who require assistance to participate in this class should contact Disability Resources and Educational Services (DRES) and see the instructor as soon as possible. If you need accommodations for any sort of disability, please speak to me after class, or make an appointment to see me, or see me during my office hours. DRES provides students with academic accommodations, access, and support services. To contact DRES you may visit 1207 S. Oak St., Champaign, call 333-4603 (V/TDD), or e-mail a message to [disability@uiuc.edu](mailto:disability@uiuc.edu). <http://www.disability.illinois.edu/>.

### **Emergency Response Recommendations**

Emergency response recommendations can be found at the following website: <http://police.illinois.edu/emergency/>. I encourage you to review this website and the campus building floor plans website within the first 10 days of class. <http://police.illinois.edu/emergency/floorplans/> .

### **Family Educational Rights and Privacy Act (FERPA)**

Any student who has suppressed their directory information pursuant to *Family Educational Rights and Privacy Act* (FERPA) should self-identify to the instructor to ensure protection of the privacy of their attendance in this course. See <http://registrar.illinois.edu/ferpa> for more information on FERPA.

## **Run > Hide > Fight**

Emergencies can happen anywhere and at any time. It is important that we take a minute to prepare for a situation in which our safety or even our lives could depend on our ability to react quickly. When we're faced with any kind of emergency – like fire, severe weather or if someone is trying to hurt you – we have three options: Run, hide or fight.



**Run** Leaving the area quickly is the best option if it is safe to do so.

- Take time now to learn the different ways to leave your building.
- Leave personal items behind.
- Assist those who need help, but consider whether doing so puts yourself at risk.
- Alert authorities of the emergency when it is safe to do so.



**Hide** When you can't or don't want to run, take shelter indoors.

- Take time now to learn different ways to seek shelter in your building.
- If severe weather is imminent, go to the nearest indoor storm refuge area.
- If someone is trying to hurt you and you can't evacuate, get to a place where you can't be seen, lock or barricade your area, silence your phone, don't make any noise and don't come out until you receive an Illini-Alert indicating it is safe to do so.



**Fight** As a last resort, you may need to fight to increase your chances of survival.

- Think about what kind of common items are in your area which you can use to defend yourself.
- Team up with others to fight if the situation allows.
- Mentally prepare yourself – you may be in a fight for your life.

Please be aware of persons with disabilities who may need additional assistance in emergency situations.

### **Other resources**

- [police.illinois.edu/safe](http://police.illinois.edu/safe) for more information on how to prepare for emergencies, including how to run, hide or fight and building floor plans that can show you safe areas.
- [emergency.illinois.edu](http://emergency.illinois.edu) to sign up for Illini-Alert text messages.
- Follow the University of Illinois Police Department on Twitter and Facebook to get regular updates about campus safety.

# PLPA509/MCB511: Molecular Biology of Plant-Microbe Interactions

Spring 2018, Turner Hall W9

Date	Day	Lecture/Discussion	Lecturer
16-Jan	Tues	Plant and pathogens, concepts, definitions etc.	Zhao
18-Jan	Thurs	Pre-penetration and preformed resistance	Zhao
23-Jan	Tues	Appressorium differentiation and penetration theory	Zhao
25-Jan	Thurs	Autophagy, non-host resistance & broad spectrum resistance gene	Zhao
30-Jan	Tues	Pathogenicity and virulence factors (1) EPS	Zhao
01-Feb	Thurs	Pathogenicity and virulence factors (2) Toxin	Zhao
06-Feb	Tues	Pathogenicity and virulence factors (3) Growth regulator	Zhao
08-Feb	Thurs	Pathogenicity and virulence factors (4) T3SS	Zhao
13-Feb	Tues	<b>Exam I</b>	
15-Feb	Thurs	Effectors (1) Bacteria	Zhao
20-Feb	Tues	Effectors (2) Fungi and Oomycetes	Zhao
22-Feb	Thurs	Host immunity (1) MAMP and PRR; PTI	Zhao
27-Feb	Tues	Host immunity (2) ETI and R Protein	Zhao
01-Mar	Thurs	Hormones in plant microbe/pest interactions (1)	Zhao
06-Mar	Tues	Hormones in plant microbe/pest interactions (2)	Zhao
08-Mar	Thurs	Signal transduction (1) (Hormone cross-talk; MAPK)	Zhao
13-Mar	Tues	Signal transduction (2) WRKY, Systemic acquired resistance; HR, Summary of PTI/ETI	Zhao
15-Mar	Thurs	<b>Exam II</b>	
20/22-Mar		<b>Spring break</b>	
27-Mar	Tues	<i>Sclerotinia sclerotiorum</i> -soybean interactions	Wei
29-Mar	Thurs	<i>Heterodera glycines</i> -soybean interaction	Nathan
03-Apr	Tues	<i>Phytophthora sojae</i> -soybean interactions	Santiago
05-Apr	Thurs	Insects/aphids-soybean interactions	Sarah
10-Apr	Tues	Induced structural resistance; induced chemical resistance (PR; phytoalexin); ROS	Zhao
12-Apr	Thurs	Quantitative resistance; Induced systemic resistance; systemic wounding response	Zhao
17-Apr	Tues	RNA silencing (RNAi) and its application	Zhao
19-Apr	Thurs	ZFN, TALEN and Cas9 and their applications	Zhao
24-Apr	Tues	<b>Student presentations (1)</b>	
26-Apr	Thurs	<b>Student presentations (2)</b>	
01-May	Tues	<b>Student presentations (3)</b>	
08-May	Tues	<b>Exam III</b>	