

COURSE INFORMATION

Course title: *Mucosal Pathogenesis*

Date: Fall Semester, 2009

Place: Microbiology Conference Room, BSB276

Time: Tuesdays and Fridays: 1:30-3:00 PM

Credit hours: 1 credit hour

Prerequisites: Students must complete *Cellular and Molecular Immunology* (05-234) or *Cellular Microbiology* (05-236).

COURSE DIRECTOR AND CONTACT INFORMATION

Course Director	Thomas C. Zahrt, Ph.D.	955-7429	tzahrt@mcw.edu
Instructor	Thomas C. Zahrt, Ph.D.	955-7429	tzahrt@mcw.edu
Instructor	Dara W. Frank, Ph.D.	955-8766	frankd@mcw.edu
Instructor	Michael B. Dwinell, Ph.D.	456-7427	mdwinell@mcw.edu
Instructor	Christopher Kristich, Ph.D.	955-4141	ckristich@mcw.edu
Instructor	Jennifer Coburn, Ph.D.	955-4116	jacoburn@mcw.edu

Course Director Open Hours: Dr. Zahrt will have open hours every Wednesday between 2:00-3:00 PM during the 6 week offering. Dr. Zahrt's office is located in the TBRC, Room C3970.

COURSE DESCRIPTION

Mucosal Pathogenesis is an upper-level, 1-credit hour Microbiology course that focuses on the interactions of microbial pathogens with cells of the mucosal epithelium. Students will gain a detailed and comprehensive understanding of specific infectious microbial pathogens, and the mechanisms utilized by these microorganisms to associate, invade, and/or cause disease at the mucosal surface. Microorganisms to be discussed include those that target that respiratory tract, the gastrointestinal tract, and the genital/urinary tract. The course will comprise a combination of formal lectures by instructors, and group discussions of scientific papers from the recent literature. Students will be evaluated through a single take-home exam that comprises 80% of the final grade. The remaining 20% of the final grade will be determined by student participation in lecture discussions or assigned readings. The course will meet twice a week for a total of 6 weeks.

STUDENT LEARNING OBJECTIVES/OUTCOMES

Course will be targeted to what kind of student: *Mucosal Pathogenesis* will be an upper-level Microbiology course for students interested in learning about the interactions of microorganisms with the human host. It will focus on the interaction of bacteria, viruses, fungi, or parasites at mucosal sites including the respiratory tract, gastrointestinal tract, and/or urinary/genital tract. The course will target advanced graduate students (primarily 3rd year) within the Microbiology Department and/or students participating in the *Mucosal Pathogens and Host Interactions T32 Training Program*. The course to be offered in fall 2009 will focus on bacteria, and is expected to complement other 1-credit courses to be offered by the Department of Microbiology and Molecular Genetics emphasizing immunological responses to microbial pathogens, and the biochemistry of bacterial toxins.

Need for course/Specific objectives of course: The course fills a gap in the current course curriculum for upper-level students in the Department of Microbiology and Molecular Genetics. Specifically, *Cellular and Molecular Immunology* and *Cellular Microbiology* provide students with a basic understanding of the interactions of microorganisms (specifically bacteria and viruses) with their host. *Mucosal Pathogenesis* will provide students with an in-depth look at any variety of microbial agents that cause disease at mucosal sites. In particular, students participating in *Mucosal Pathogenesis* will gain a detailed and comprehensive understanding of a selected group of bacteria, viruses, fungi, or parasites, and learn the mechanisms by which these organisms associate with, invade, or cause disease at mucosal surfaces. The course to be offered in fall 2009 will focus on bacteria.

Projected enrollment: The course is expected to primarily draw students from the Department of Microbiology and Molecular Genetics. The topics covered may also be relevant to students from the Departments of Biochemistry or Biophysics. Enrollment of at least 4 students will be required for this course to be offered. On average, it is expected that the class size will be between 6 and 12 students.

COURSE STRUCTURE AND EXPECTATIONS

Course structure: The course will meet Tuesday and Friday afternoons, 1:30-3:00 PM for a total of 6 weeks. A combination of didactic lectures and paper discussions will be used to cover each lecture topic (i.e. organism). Students will also be expected to acquire substantial background information in out-of-class readings. The course will include lectures/paper discussions of bacterial pathogens that specifically target the respiratory tract (*Mycobacterium tuberculosis* and *Pseudomonas aeruginosa*), gastrointestinal tract (*Campylobacter jejuni* and *Listeria monocytogenes*), and genital/urinary tract (*Treponema palidum* and *Neisseria gonorrhoeae*). Typically, instructors will present a 90 min lecture during one class session and integrate this material into discussions of 1-2 papers in the remaining class session for that week. Instructors will disseminate lecture materials and papers to course participants electronically using ANGEL several days prior to the class session. Students are expected to attend all class sessions and actively participate in the lecture and/or associated paper discussions.

Relationship of course to existing MCW courses: Materials to be covered in this course are new and have not previously been offered as part of the Department of Microbiology and Molecular Genetics course offerings. The course is expected to both complement and expand the current curriculum taught in *Cellular and Molecular Immunology* and *Cellular Microbiology*.

Replacement or overlap with other MCW courses: This course will not replace or overlap with other MCW courses.

COURSE SCHEDULE (FALL 2009)

Tuesday, August 18th. Lecture: Introduction to *Mycobacterium tuberculosis* and mechanisms of pathogenesis with a focus on alveolar macrophages and lung pneumocytes. (Dr. Thomas Zahrt, Ph.D.)

Friday, August 21st. Paper discussion(s): Interactions of *M. tuberculosis* with tissues of the lung. (Dr. Thomas Zahrt, Ph.D.)

Tuesday, August 25th. Lecture: *Pseudomonas aeruginosa* and chronic infections of the cystic fibrosis lung. (Dr. Dara Frank, Ph.D.)

Friday, August 28th. Paper discussion(s): *P. aeruginosa* virulence factors and associated lung disease (Dr. Dara Frank, Ph.D.)

Tuesday, September 1st. Lecture: *Campylobacter jejuni* and interactions with the gastrointestinal tract. (Dr. Michael Dwinell, Ph.D.)

Friday, September 4th. Paper discussion(s): *Campylobacter jejuni* and food-borne disease.

Tuesday, September 8th. Lecture: Introduction to *Listeria monocytogenes* and interactions with gut epithelial cells. (Christopher Kristich, Ph.D.)

Friday, September 11th. Paper discussion(s): Listeriosis and mechanisms of food-borne disease. (Christopher Kristich, Ph.D.)

Tuesday, September 15th. Lecture: The various infection stages of *Treponema pallidum* and syphilis. (Dr. Jennifer Coburn, Ph.D.)

Friday, September 18th. Paper discussion(s): Mechanisms of *T. pallidum* pathogenesis. (Dr. Jennifer Coburn, Ph.D.)

Tuesday, September 22nd. Lecture: Pathogenesis of *Neisseria gonorrhoeae* and vaccine development. (Dr. Dara Frank, Ph.D.)

Friday, September 25th. Paper discussion(s): Interactions of *N. gonorrhoeae* in the genital/urinary tract. (Dr. Dara Frank, Ph.D.)

Friday, September 25th. TAKE HOME EXAM, 1 WEEK TO COMPLETE

GRADING POLICY

Students will be evaluated through a single take-home exam at the end of the course, and through class participation. The take home exam will comprise 80% of the final grade and will allow students to apply skills and knowledge acquired in class by probing the literature for creative solutions to a problem. The remaining 20% of the grade will be based on student participation, resulting primarily from the reading and discussion of papers that have been assigned by course instructors, and through participation in didactic lectures.

RESOURCES

No textbooks are required for this course. Required readings will come from assigned papers that will be discussed during class sessions.

TECHNICAL REQUIREMENTS

All students will be required to use ANGEL as part of the course to download lecture materials and assigned papers.

MISSED EXAM POLICY/GUIDELINE

Students are referred to the online Graduate School Handbook for the policy on missed assignments or examinations. In brief, vacations and personal travel are not acceptable excuses for missed assignments or examinations. If students will be away to attend a scientific meeting, the proposed absence must be discussed with the Course Instructor and Course Director in advance of the absence. Absences due to illnesses should be discussed with the Course Director as soon as possible after recovery. If the final examination is missed due to illness, a note from a licensed health care provider supporting the absence will be required.

COURSE EVALUATION POLICY

All students completing the course for credit are required to complete an online Course Evaluation on ANGEL at the end of the course. Participation by all students is important for the Graduate School's course evaluations process and for our continued accreditation. The Graduate School will provide instructions on how to complete the evaluation about 2 weeks before the course ends, and you will have until 2 weeks after the end of the course to complete the evaluation. Students who fail to complete the evaluation are no longer in good standing. The Graduate School will not provide transcript, confirm enrollment, allow enrollment in additional courses, allow graduation, or support payment of stipends for students who are not in good standing.

DRAFT FOR GRADUATE SCHOOL BULLETIN

Please see attached

SPONSORSHIP STATEMENT

Please see attached letters of support from Dr. Paula Traktman, chair of the Department of Microbiology and Molecular Genetics.

Graduate School Bulletin

Course title: *Mucosal Pathogenesis*

Semester: Fall 2009

Credit hours: 1 credit hour

Course Director: Thomas Zahrt, Ph.D. Microbiology and Molecular Genetics

Course description:

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Paula Traktman, PhD
Walter Schroeder Professor and Chairman

Department of Microbiology
and Molecular Genetics

March 26, 2009

Owen Griffith, Ph.D.
Dean, Graduate School of Biomedical Sciences
Medical College of Wisconsin

Prakash Laud, Ph.D.
Chair, Curriculum Programs Committee
Medical College of Wisconsin

RE: New Course Submission from Department of Microbiology and Molecular Genetics

Dear Drs. Griffith and Laud:

This letter is to confirm my support for the new upper-level Microbiology course *Mucosal Pathogenesis* that is being proposed by Dr. Thomas Zahrt. I affirm that I will make available all of the necessary support within the Microbiology Department to teach this course, including faculty time, facilities, and financial support if necessary. This course will fill a current gap in our curriculum for upper-level Microbiology students, and will comprise an important part of the academic training curriculum being developed for a T32-based Training Program in Mucosal Pathogens and Host Interactions by the Center for Biopreparedness and Infectious Disease and the Department of Microbiology and Molecular Genetics.

Sincerely,

A handwritten signature in black ink that reads "Paula Traktman".

Paula Traktman, Ph.D.
Walter Schroeder Professor and Chairman
Department of Microbiology and Molecular Genetics
Medical College of Wisconsin