

BIOL 506-001 Selected Topics in Microbiology (3 Credits): Cellular Microbiology

Prerequisites: BIOL 305, 306, or permission of instructor. Topic depends on instructor's specialty.

Instructor: Dr. Ramin M. Hakami

Day/Time: Tuesday, 4:30 – 7:10 pm, Spring Term, 2013

Room: Prince William Campus; Bull Run Hall, Room 248

Office Hours: Wednesdays, 1:00 – 3:00 pm, 10650 Pyramid Place (Biological Research Laboratories), Room 1022, or by appointment.

Email: (Strongly preferred) rhakami@gmu.edu; Phone: 703-993-7084

Suggested Textbook (NOT required): Cellular Microbiology, 2nd Edition. Editors: Pascale Cossart; Patrice Boquet; Staffan Normark; Rino Rappuoli. (PW campus bookstore)

Suggested Text: **Reading Primary Literature:** A Practical Guide to Evaluating Research Articles in Biology. Christopher Gillen. Pearson, Benjamin Cummings. ISBN 0-8053-4599-X

Final grades:					
90-100	A	80-82	B	69-72	C
87-89	A-	77-79	B-	65-68	C-
83-86	B+	73-76	C+	<65	F

Grade Distribution:	
Attendance	5%
Journal Article	15%
Midterm Exam	30%
Final Exam	50%
Total	100%

Journal Article Assignment (15%): Please see the table on the next page for a list of the topics for these articles and the due dates for presenting them. Each student will be assigned one journal article for the semester and I'll make the assignments as we go through the semester. For this assignment, select a recent journal article (published between 2010 and 2013) and discuss in class by making a half an hour presentation of the data figures and the findings. You must also provide a critical analysis of the data, not just repeat what is outlined in the article. In other words, you must discuss your analysis of the strengths and weaknesses of the article; for example, whether the methodologies used are appropriate and adequate, if additional experiments are warranted, whether you think the conclusions of the article are appropriate and match the findings, and what future questions should be addressed. You must e-mail me your selected article by the end of Friday of the week before the presentation week. I'll then post it on Blackboard so that everyone can access it and have a chance to read it before class.

Late Journal Article Presentation: All journal article assignments must be presented on the assigned due dates. If you miss your assigned presentation date, you will be given a make-up date provided you have written documentation that shows a valid excuse for your absence (e.g., a doctor's note; police report of a car accident, etc.). Otherwise, you will not receive any credit for this part.

Midterm and Final Exams: These will be closed-book exams given in this class. If you miss the midterm exam, a make-up option will be available provided you have written documentation that shows a valid excuse for your absence (e.g., a doctor's note; police report of a car accident, etc.). A make-up option is not available for the final exam, and anyone who misses the final exam will not pass the course.

Late Arrival to Class and Laptop Use Policy: Please attend the lectures regularly and try to be on time for the class. If you keep missing the class or habitually arrive late, it will hurt the attendance part of your grade. During class, the use of electronic devices such as laptops is allowed only for class-related activities such as taking notes or downloading research articles that are being presented.

Date	Week	Topic	Suggested Reading from Cellular Microbiology Book
Jan 22	1	An Introduction to Cellular Microbiology	Chapter 1: Microbial Pathogens: an Overview Chapter 2: Bacterial Human Pathogen Genomes: an Overview
Jan 29	2	Cell biology and ECM	Chapter 3: Cell Biology: an Overview Chapter 4: Extracellular Matrix and Host Cell Surfaces: Potential Sites of Pathogen Interaction
Feb 5	3	Bacterial Adherence & Cell Adhesion	Chapter 5: Bacterial Adherence to Cell Surfaces and Extracellular Matrix. Chapter 6: Molecular Basis for Cell Adhesion and Adhesion-Mediated Signaling Journal Article 1 topic: “Your favorite bacteria: Bacterial Adherence to Cell Surfaces”, due Feb 12 th .
Feb 12	4	Signaling to Host Cells through Adhesion	Chapter 7: Bacterial Signaling to Host Cells thru Adhesion Molecules & Lipid Rafts Chapter 8: Host Cell Membrane Structure and Dynamics. Journal Article 2 topic: “Your favorite gram-negative bacteria: Bacterial Signaling to Host Cells through Adhesion Molecules”, due Feb 19 st .
Feb 19	5	Membrane Trafficking and Intracellular Parasites	Chapter 9: Membrane Traffic in the Endocytic Pathway of Eukaryotic Cells Chapter 10: Where to Stay inside the Cell: a Homesteader's Guide to Intracellular Parasitism. Journal Article 3 topic: “Your favorite virus: Trafficking through Host Cells”, due March 19 th .
Feb 26	6	NO CLASS	NO CLASS: SCIENTIFIC CONFERENCE
March 5	7	Host Cell Cytoskeleton, and MIDTERM EXAM	MIDTERM EXAM Chapter 11: The Actin Cytoskeleton: Regulation of Actin Filament Assembly and Disassembly, Chapter 12: Bacterial Manipulation of the Host Cell Cytoskeleton. Journal Article 4 topic: “Manipulation of the Host Cell Cytoskeleton by <i>Yersinia pestis</i> ”, due March 26 th .
March 12	8	NO CLASS	NO CLASS: SPRING BREAK
March 19	9	Mechanisms of Virus Infection Guest Lecture: Dr. Kehn-Hall	Chapter 22. Cell Biology of Virus Infection Journal Article 5 topic: “Your favorite negative strand virus: Signaling through Receptors”, due April 2 nd .
March 26	10	Secretion Systems. Type III and IV Secretion Systems	Chapter 15: Type III secretion Systems in Animal- and Plant-Interacting Bacteria. Chapter 16: Bacterial Type IV secretion systems: DNA Conjugation Machines Adapted for Export of Virulence Factors. Journal Article 6 topic: “Your favorite Type IV bacteria: Secretion systems and pathogenesis”, due April 9 th
April 2	11	Apoptosis	Chapter 17: Induction of Apoptosis by Microbial Pathogens. Journal Article 7 topic: “Your favorite virus: Induction of host cell apoptosis”, due April 16 th .

April 9	12	Innate & Adaptive Immune System	Chapter 18: Interaction of Pathogens with the Innate and Adaptive Immune System. Journal Article 8 topic: “Immune response to Rift Valley fever virus”, due April 23 rd .
April 16	13	Virulence Gene Discovery	Chapter 20. New Tools for Virulence Gene Discovery Journal Article 9 topic: “Your favorite virus: Identifying candidate virulence genes”, due April 30 th . Journal Article 10 topic: “Your favorite bacteria: Use of protein arrays in studies of pathogenesis”, due April 30 th .
April 23	14	Genomic and Molecular Tools	Chapter 21. Genome-Wide Approaches to Studying Prokaryotic Biology
April 30	15	Last Day of Class	Wrap-up: Review and presentation of any remaining journal articles
May 14		FINAL EXAM	Closed Book Final

Academic Integrity

GMU is an Honor Code university; please see the University Catalog for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. Academic integrity in this course means that you will perform the assigned tasks and if you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind), please ask for guidance and clarification.

GMU E-mail Accounts

Students must use their Mason email accounts to receive important University information, including messages related to this class. See <http://masonlive.gmu.edu> for more information.

Office of Disability Services

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474. All academic accommodations must be arranged through the ODS. <http://ods.gmu.edu>

Other Useful Campus Resources

UNIVERSITY LIBRARIES "Ask a Librarian" <http://library.gmu.edu/mudge/IM/IMRef.html>

COUNSELING AND PSYCHOLOGICAL SERVICES (CAPS): (703) 993-2380; <http://caps.gmu.edu>

University Policies

The University Catalog, <http://catalog.gmu.edu>, is the central resource for university policies affecting student, faculty, and staff conduct in university academic affairs. Other policies are available at <http://universitypolicy.gmu.edu/>. All members of the university community are responsible for knowing and following established policies.