

Biochemistry 3MI3
Microbial Interactions
Fall 2019

INSTRUCTOR

Dr. John Whitney

Assistant Professor

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TEACHING ASSISTANTS

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TIME AND PLACE

Lectures: Tuesday and Thursday 2:30-3:20 PM, ETB 238

Tutorial: Monday 12:30-1:20 PM, ETB 227 (Group A)

Friday 10:30-11:20 AM, BSB 117 (Group B)

TEXTBOOK

There is no required or recommended textbook for this course.

OVERVIEW AND LEARNING OBJECTIVES

This course examines how interactions with bacteria influence all cellular life on earth. Topics include conflict and collaboration between bacteria, host-pathogen and host-symbiont interactions, and biological innovations arising from battles between bacteria and bacteriophages. You will come to appreciate that the classification of bacteria as symbionts, commensals and pathogens is a consequence of the outcome of their interactions with other microbes and hosts.

EVALUATION

Midterm Exam 25% (held in class, refer to schedule below for date)

Journal Club Presentation and Participation 25% (further breakdown in Tutorial Guidelines)

Written Assignment 15% (*News & Views* style article)

Final Exam 35% (to be scheduled by the Registrar)

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Lecture Schedule

Themes of 3MI3: Introduction to bacteriology, Interactions between bacteria and bacteriophage, Interbacterial Interactions and Interactions between bacteria and their hosts

WEEK	DATE	TOPIC	RECOMMENDED READING
1	Sept. 3 rd	History of Microbiology	Uploaded to A2L
	Sept. 5 th	Bacterial Cell Structure I	20452953*
2	Sept. 10 th	Bacterial Cell Structure II	
	Sept. 12 th	Bacterial Taxis and Motility	20694026
3	Sept. 17 th	Introduction to Bacteriophages (Dr. Hynes)	26548913
	Sept. 19 th	Phage Infection Cycles (Dr. Hynes)	
4	Sept. 24 th	Resistance to Phage Infection (Dr. Hynes)	20348932
	Sept. 26 th	How Phage Overcome Resistance (Dr. Hynes)	23979432
5	Oct. 1 st	Bacterial Communication: Quorum Sensing	10607620
	Oct. 3 rd	Microbial Biofilms	27510863
6	Oct. 8 th	Multicellular Bacteria	24384602
	Oct. 10 th	Antibacterial Toxin Delivery Systems	24581686
7	READING WEEK		
8	Oct. 22 nd	MIDTERM	N/A
	Oct. 24 th	Bacteriocins and Secondary Metabolites	21498065
9	Oct. 29 th	Bacterial Symbionts of Arthropods and Mollusks	18268509
	Oct. 31 st	Bacterial Symbionts of Humans: The Microbiome	22411464
10	Nov. 5 th	Plant Pathogenic Bacteria	22672649
	Nov. 7 th	Bacterial Exotoxins	25023120
11	Nov. 12 th	Nutrient Acquisition in Host Environments	20711357
	Nov. 14 th	Enteric Pathogens of Humans	20649986
12	Nov. 19 th	Intracellular Pathogens	18785836
	Nov. 21 th	Vector-borne Bacterial Diseases	22230951
13	Nov. 26 th	Current Research in Microbiology	N/A
	Nov. 28 th	Review	N/A

*This number is a PubMed ID (PMID). If you go to www.ncbi.nlm.nih.gov/pubmed/ and type in this number, you will be directed to the recommended reading. The reading material will also be made available on Avenue to Learn.

*****FINAL EXAM TO BE SCHEDULED BY THE REGISTRAR*****

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Tutorial Schedule

WEEK	DATE	TOPIC
1	September 2 nd	No Tutorial
2	September 9 th	No Tutorial
3	September 16 th	Introduction
4	September 23 rd	Group presentations (2)
5	September 30 th	Group presentations (2)
6	October 7 th	Group presentations (2)
7	READING WEEK	
8	October 21 st	No Tutorial
9	October 28 th	No Tutorial
10	November 4 th	Group presentations (2)
11	November 11 th	Group presentations (2)
12	November 18 th	Group presentations (2)
13	November 25 th	No Tutorial

Tutorial attendance is mandatory and consists of group presentations. These presentations will be run in the style of a journal club. At the start of the semester, you will be divided into small groups and assigned a journal article that is related to one of the topics we discussed in class. Groups are expected to meet outside of class time and learn the contents of the article. Each group will then present their article to the class and answer audience questions. Groups will be evaluated based on their understanding of the paper, oral presentation style and ability to answer questions. After the first round of presentations, students will receive constructive feedback from the TAs. After the midterm break, groups will be assigned a second paper to present with the expectation that the suggestions for improvement will be incorporated into the second presentation. The two presentations will be evaluated separately and the one with the highest grade will be used for the presentation component of your final grade (25%).

Written Assignment

An essential component of being a researcher in the biomedical sciences is scientific literacy and communication. These skills not only allow scientists to effectively communicate their own findings but also summarize the findings of others. *News and Views* articles are succinct commentaries on articles published in high impact journals such as *Nature* or *Science* (refer to <http://www.nature.com/news/newsandviews> for examples). These pieces are typically short (~1000 words) and are written in the style of a **journalistic news report**. The objective of these articles is to concisely summarize the findings of complex journal articles and convey these to a **lay** audience. Additionally, they also contain a discussion of the importance of the work and provide a critical evaluation of the research. These articles typically contain **one figure**, which provides a pictorial overview of the major findings. Once during the semester, you will be assigned a tutorial presentation to write a *News and Views* article on. This article is due on December 1st and is worth 15% of your final grade.

Academic Integrity

You are expected to exhibit honesty and use ethical behavior in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behavior can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the university. *It is your responsibility to understand what constitutes academic dishonesty.* For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at <http://www.mcmaster.ca/academicintegrity>

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g. the submission of work that is not one’s own or for which other credit has been obtained.
2. Improper collaboration in group work.
3. Copying or using unauthorized aids in tests and examinations.

The written assignment will be cross-referenced with the scientific literature to ensure that your *News & Views* article represents original work.

Avenue to Learn

In this course, we will be using Avenue to Learn (A2L). Students should be aware that, when they access the electronic components of this course, private information such as first and last names, usernames for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure.

All written work will be marked on grammar, clarity of writing, and organization, as well as content and analysis. The writing assignment must be properly referenced. It is suggested that students have Mendeley to keep track of references. This is a free reference software program offered to McMaster Students. Students are encouraged to visit the Centre for Student Development to improve their essay skills (MUSC B107; x24711). For information about the Writing Clinic and the Centre’s other services, visit the Centre’s website: <http://csd.mcmaster.ca>

Assignment Deadlines and Missed or Late Work

The written assignment must be submitted by the due date (through submission folders on *Avenue to Learn*). DO NOT submit essays by email, unless you are instructed to do so by the instructor or TA. A late assignment will be **penalized 10% a day** (weekends will count as *two* days). Late penalties will not be waived unless your Faculty/Program Office advises the instructor that you have submitted to that office the appropriate documentation to support your inability to submit the work by the due date.

McMaster Student Absence Form

This is an online, self-reporting tool for students to report absence due to minor medical situations that last up to 3 days and to request accommodation for any missed academic work that is worth less than 25% of the final grade. Please note that this tool cannot be used during final examination period. It is the prerogative of the Instructor to determine the appropriate relief for missed work. You may submit a maximum of one request per term. The form should be filled out immediately when you are about to return to class after your absence. It is your responsibility to follow up with Dr. Whitney immediately about the nature of the accommodation. If you are absent for more than 3 days, have missed academic work worth 25% or more must be reported to the associate Dean's office, with documentation, and relief may not necessarily be granted.

Academic Accommodation of Students with Disabilities

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contacted by phone 905-525-9140, ext. 2865 or e-mail: sas@mcmaster.ca. For further information, consult McMaster University's Policy for *Academic Accommodation of Students with Disabilities*.

Academic Accommodation for Religious, Indigenous or Spiritual Observances (RISO)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students requiring a RISO accommodation should submit their request to their Faculty Office normally within 10 working days of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

Extreme Circumstances

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster e-mail and course websites weekly during the term and to note any changes.