

MICR302
Molecular Microbiology
CRN 22284
Winter 2016

Class time/location: Mon, Thurs, 11:30 – 12:50, ECS 125

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Textbook: Since the course material is as up-to-date as possible, there is no course textbook. Much of the source material (papers) will be provided on-line in the CourseSpaces site, and will serve as an additional resource. You will need your UVic NetLink ID and password to access this information.

It is, however, recommended that you have easy access to a standard microbiology textbook.

Lecture Notes: Notes will generally be made available on the CourseSpaces site prior to lectures. Notes are arranged by topic, and a single topic may span multiple lectures. ***Lecture notes are not complete***, and students will be responsible for all materials covered in the lectures.

MICR302 course learning objectives:

In this course, you will gain the tools to recognize relationships between DNA, RNA and protein. Applying these tools, you will be able to evaluate the specific contributions of different molecular mechanisms microbes utilize to respond to environmental changes.

You will have the ability to compare microbial communication and signalling strategies.

You will understand the importance of the microbiome in maintaining human health.

You will be able to discuss the utility of budding yeast a model eukaryotic system.

By the end of the course, it is expected that each student will be capable of examining a biological response and hypothesizing which underlying genetic and/or biochemical process defines the response. Students will then be able to design experiments, including all relevant controls, to test their proposed hypothesis.

Tentative Class Schedule:

topic	comments
1 Introduction	
2 DNA	
a) gene structure and expression	comparison between prokaryotic and eukaryotic systems
3 RNA	
a) stability and processing	mRNA decay, processing stable RNA transcripts
b) riboswitches	overview of riboswitches
c) CRISPR	RNA silencing in prokaryotes
4 Protein	
a) two component systems	introduction to prokaryotic protein signalling
b) protein splicing	inteins and exteins, applications
c) translational surveillance	identification and destruction of aberrant proteins in prokaryotes
5 Environment	
a) heat shock	role of sigma factors, chaperones and proteases
b) envelope stress	antisigma factors
c) stationary phase	s
d) stringent response	ppGpp
e) sporulation	role of phosphorylation and sigma factors
6 Bacterial Signalling	
a) environmental	chemotaxis and two component systems
b) community	quorum sensing and bacterial communication, importance of biofilms
7 Microbiome	how does the microbiome impact human health?
8 Budding yeast: a model eukaryote	Lifecycle, examples of conserved signal transduction pathways, molecular methods, genetic techniques and systems level high-throughput methods for insight into eukaryotic biology.

DEPARTMENT INFORMATION AND POLICIES

1. The Department of Biochemistry and Microbiology upholds and enforces the
These policies are described in the
current University Calendar. All students are advised to read this section.
2. Cell phones, computers, and other electronic devices must be turned off at all times unless being used for a purpose relevant to the class. Students having a cell phone, tablet, or computer on their person during an exam will be assumed to have it for the purpose of cheating.
3. Any recordings of lectures may only be performed with written permission of the instructor, and are for personal use only. The instructor retains copyright to such recordings and all lecture materials provided for the class (electronic and otherwise); these materials must not be shared or reposted on the Internet.
4. Course materials, such as notes, problem sheets, quizzes, examinations, example sheets, or review sheets, may not be redistributed without the explicit written permission of the instructor.
5. Students are expected to be present for the midterm and final exams. Instructors may grant deferrals for midterm examinations for illness, accident, or family affliction, and students must provide appropriate documentation 48 hours after the midterm exam. The deferred exam must be written within five business days of the original exam. The Department of Biochemistry and Microbiology considers it a breach of academic integrity for a student taking a deferred examination to discuss the exam with classmates. Similarly, students who reveal the contents of an examination to students taking a deferred examination are considered to be in violation of the University of Victoria policy on academic integrity (see current University Calendar). Deferral of a final exam must be requested with an Academic Concession form and submitted dirTJETBT71.6aB to d

Resource Centre for Students with a Disability

Students with diverse learning styles and needs are welcome in this course. In