OCSC 4940 Immunobiology of Aquatic Organisms

Instructor
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Office hours in-person: Dep. Ocean Sciences, AX3005. Open office hours and upon request. Every effort will be made to respond to emails within 24 h, with the exceptions of evenings, weekends and holidays.

Tuesday and Thursday: 5:30-7:00 PM
Challenge Room, Department of Ocean Sciences & WebEX online (https://mun.webex.com/mun/j.php?MTID=m1bdba6115f7f9b7f09c3ed3479d756dc)

4940 Special Topics in Immunobiology of Aquatic Organisms provides an overview of immunology of aquatic organisms. The focus is on comparative immunology, immune response to infections and environmental stressors (e.g. temperature, pollutants), and vaccinology of commercially cultured fish species. This course also covers topics related to the origin of adaptive immunity, antigen recognition and antibody diversity, memory immune response, and vaccine development. Lab visits and mini-labs are part of this course.

PR: Biology 2250 or Biology 2060 or Biochemistry 2200 (or former Biochemistry 2100) or OSCS 3600

Schedule

Dates	Topic	Assigment*	Activities /Reading
Lecture 1 Jan 05th	• Curse objective and contents • Introduction to Immunology	Assignment 1 Book chapter 1 questionary	Book chapter 1 Janeway's Immunobiology
Lecture 2 Jan 10th	• The immune system: tissues and cells	Book chapter 2 questionary	Book chapter 2 Janeway's Immunobiology,
Lecture 3 Jan 12th	• Innate immune response and immunogen recognition	Video links	Book chapter 1 Janeway's Immunobiology,
Lecture 4 Jan 17th	• Adaptive immune response and antigen recognition		Book chapter 1 Janeway's Immunobiology,
Lecture 5 Jan 19th	Diversity and development of antigen receptors in lymphocytes: • Antibodies		Book chapter 5 Janeway's Immunobiology,
Lecture 6 Jan 24th	Diversity and development of antigen receptors in lymphocytes: • Ig diversity		Book chapter 5 Janeway's Immunobiology,

Lecture 7 Jan 26th	Diversity and development of antigen receptors in lymphocytes: • Antigen presentation and T-cell recognition		Book chapter 5 Janeway's Immunobiology
Lecture 8 Jan 31th	Diversity and development of antigen receptors in lymphocytes: • Major Histocompatibility complex (MHC)		Book chapter 5 Janeway's Immunobiology
Feb 02nd	• Mid-term #1		
Lecture 9 Feb 07th	• Cellular and Humoral immune responses: antigen presentation	Video links	Book chapter 6 Janeway's Immunobiology
Lecture 10 Feb 09rd	• Host defenses against the infection		Book chapter 6 Janeway's Immunobiology
Lecture 11 Feb 14th	• Humoral Immune response		Book chapter 6 Janeway's Immunobiology
Lecture 12 Feb 16th	• Immune Regulation and Mucosal immunity		
Feb 20st Feb 24th			
Feb 28th	Mid-term #2		
Lecture 13 Mar 02st	• Teleost immune system	Discussion Articles #1, #2, and #3	**#1. Origin and evolution of the adaptive immune system: genetic events and selective pressures.** Nature Reviews. Volume 11 | January 2010 **# 2. Evolution of the Immune System in the Lower Vertebrates.** Annu. Rev. Genomics Hum. Genet. 2012. 13:11.1-11.23 **#3. Evolution of B cell Immunity.** Annu. Rev. Anim. Biosci. 2013. 1:17.1-17.33 **#4**
Lecture 14 Mar 07th	• Elasmobranches immune system	Discussion Articles #4	**#4 Fishing for mammalian paradigms in the teleost immune system.** VOLUME 14 NUMBER 4 April 2013 nature immunology
Lecture 15 Mar 09th	• Agnathan immune system	Discussion Articles #5 and #6	**#5 Alternative adaptive immunity strategies: coelacanth, cod and shark Immunity.** Molecular Immunology Volume 69, January 2016, Pages 157-169 **#6 Another manifestation of GOD.** NATURE|VOL 430 | 8 JULY 2004 |www.nature.com/nature
Lecture 16 Mar 14th	• Marine Invertebrate immunity I		
Lecture 17 Mar 16th	• Marine Invertebrate immunity II		
Lab 1 Mar 21th	• Immune Techniques I		
Lab 2 Mar 23th	• Immune Techniques II		

Lab 3 Mar 28th	Mini-Lab #1 Immune Cells		
Lab 4 Mar 30th	Mini-Lab # 2 Western Blots		
Apr 04th	**Oral Presentations**		
Apr 06th	**Oral Presentations**	**Assignment Lab Report Due**	
Apr ??th	**Final Comprehensive Exam**		

*****The dates for all assignments and tests are tentative and will be confirmed in class. In the event of a class cancellation on the date a test is to be written or an assignment is due, check the course website for rescheduling information.

Format
Lecture format: 3 hours per week, divided into two 1.5 h lectures per week

Reading Assignments: The articles listed will be available in the D2L (Brightspace) portal and discussed during lectures. Additional reading will be assigned to each lecture from the requested reference book.

Evaluation

- Midterm #1 (20%)
- Midterm #2 (20%)
- Oral presentation (20%)
- Final Exam (25%)
- Lab Report (10%)
- Participation and attendance (5%)

Tests (20% each, total 40%): The student will be evaluated in three different aspects, including fundamental concepts, contextualization of the concept, and application of the learned concepts. Advice on how to prepare will be provided.

Oral presentations (20%): The students have to present 4 articles (5% each). Students prepare and deliver a slideshow covering the methods, results, and interpretation of specific assigned article. Advice on how to create efficient slideshows will be provided. The format will be 10-12 min presentation and 3 min questions. The evaluation rubric will be provided in advance.

Assignments (5%): The assignments will be based on fundamental literature (Book chapters) and a questionnaire. The answer to the questions will be discussed during lectures in addition to the articles.

Participation (5%): Students are expected to participate actively in all aspects of the course, especially during discussion lectures. Every student is assessed continuously throughout the course on his/her level

of involvement, from the sharing of ideas and opinions during discussions, to the general attitude and level of preparation before and during class and oral presentations.

Lab Report (10%): It is expected that the student produces a high-quality lab report including details for the material and method used.

Comprehensive final exam (25%): The format of the final exam will not differ from the regular tests, however all the lectures and oral presentations will be evaluated. Advice on how to prepare for the exam will be provided.

Bibliography (the book listed will be placed on reserve at the library)

- Janeway's Immunobiology, 9th edition, 2016. Kenneth Murphy and Casey Weaver. Garland Science.
- https://www.academia.edu/40521511/Janeways_Immunobiology_9th_Edition

ATTENDANCE AND PARTICIPATION

Regular attendance and class participation are expected of all students. An important component of your final grade will be an assessment of your active class participation in a variety of dynamic learning exercises throughout the semester. This includes assessment of a student's ability to critically analyze and interpret published scientific literature. Excessive absences and/or a lack of active participation could result in a lower course grade. Should a student miss a class, it is that student's responsibility to obtain notes from another classmate. Work-related absences, etc., are not a legitimate excuse for missing class. Absent students can NOT make up daily in class performance-based assessment points. If you miss an exam because of an *excused* absence you will be allowed to make up the exam but *only if you meet the criteria of MUN regulations*. There are NO makeups for exams missed due to unexcused absences.

PLAGIARISM

As outlined in Section 4.12.4 of MUN's Calendar, plagiarism (the act of presenting the ideas or works of another as one's own) is a form of academic offence. Plagiarism will not be tolerated in this course. Any student who plagiarizes another's work exposes himself/herself to the disciplinary measures outlined in section 4.12 of MUN's Calendar, which includes course expulsion. We will provide clear guidelines on how to avoid this problem.

EQUITY, ACCESSIBILITY AND COLLABORATION.

Memorial University of Newfoundland is committed to supporting inclusive education based on the principles of equity, accessibility and collaboration. Accommodations are provided within the scope of the University Policies for the Accommodations for Students with Disabilities (www.mun.ca/policy/site/policy.php?id=239). Students who may need an

academic accommodation are asked to initiate the request with the Glenn Roy Blundon Centre at the earliest opportunity (www.mun.ca/blundon).

MISCONDUCT (UNIVERSITY REGULATION 6.12).

Students are expected to adhere to those principles which constitute proper academic conduct. A student has the responsibility to know which actions, as described under Academic Offences in the University Regulations, could be construed as dishonest or improper. Students found guilty of an academic offence may be subject to a number of penalties commensurate with the offence including reprimand, reduction of grade, probation, suspension or expulsion from the University. For more information regarding this policy, students should refer to the University Regulations for Academic Misconduct (Section 6.12) in the University Calendar.