

Molecular and Cell Biology of Lipids Syllabus

Department of Biochemistry and Molecular Biology

BIOC 5307 Fall 2023

Dalhousie University acknowledges that we are in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq People and pays respect to the Indigenous knowledges held by the Mi'kmaq People, and to the wisdom of their Elders past and present. The Mi'kmaq People signed Peace and Friendship Treaties with the Crown, and section 35 of the Constitution Act, 1982 recognizes and affirms Aboriginal and Treaty rights. We are all Treaty people.

Dalhousie University also acknowledges the histories, contributions, and legacies of African Nova Scotians, who have been here for over 400 years.

Course Instructor(s)

Name	Email	Office Hours
Barbara Karten	bkarten@dal.ca	Tupper Link 2L-C1

Course Description

Explores mechanisms and regulation of lipid metabolism, trafficking, and cell signaling. Includes sections on lipids in the central nervous system, methods of lipid analysis, and lipids in disease. Emphasis is given to the evaluation of original data and critical reading of current literature. Evaluation is based on seminar presentations, an essay, and short home assignments.

Course Prerequisites

None

Course Exclusions

None

Student Resources

To meet with the instructor, arrange an appointment by emailing bkarten@dal.ca

Course Structure

Course Delivery

The course is a seminar-style course, with student presentations, in-class discussions, and some lecture components. All classes are in person. Attendance is mandatory. Students should email the instructor if they miss a class.

Lectures

Classes are weekly on Wednesdays, 9:30 to 11 am in Room 6M, Sir Charles Tupper Medical Building. Classes start Sept 13th, there will be no class Sept 6th. The course schedule will be posted on the course Brightspace page.

Course Materials

The course uses primary research papers and review articles, which are freely available from the PubMed database.

Assessment

Assignments

Over the course of the term, students give two oral presentations (Journal Club style; 20% each) and write one essay about a topic of their choice as discussed with the instructor. The essay will be written in two stages, students first write a detailed structure and bulleted list of the main sections and concepts of the essay (10%), then, with feedback from the instructor, an essay of 10 - 20 pages (double spaced, not including figures and references, 20%). Students write a short 1-2 page summary of their own research project (10%), and work in small groups to develop and propose an additional experiment within the scope of their own graduate research that incorporates an element discussed in the course (15%). More details about this assignment can be found on the Brightspace page. Students are expected to read journal articles presented by the other students and be prepared for a scientific discussion of the paper. General participation in the class discussions represents 5% of the grade.

Oral presentation skills	Journal article presentation (2)	2 x	20%
Writing skills	Summary of research project		10%
Communication/Planning	Proposed experiment		15%
Writing skills	Essay, outline		10%
Writing skills	Essay, final		20%
Communication	Participation in discussions		5%

Tests/quizzes: None

Other course requirements

In person attendance in the weekly classes is mandatory. Students are expected to notify the instructor by email if they miss class.

Conversion of numerical grades to final letter grades follows the Dalhousie Grade Scale for Graduate Courses:

A+ (90-100)	B+ (77-79)	F (0-69)
A (85-89)	B (73-76)	
A- (80-84)	B- (70-72)	

Course Policies on Missed or Late Academic Requirements

Assignments must be completed by the deadlines given in the course syllabus. Late assignments without authorized extensions will lead to a deduction in the grade. 5% of the maximum achievable grade for the assignment will be deducted for each day an assignment is late. Assignments more than one week late will not be accepted.

Course Policies related to Academic Integrity

Students are expected to compose the written assignments themselves, including the research summary, without help from their supervisor or other faculty members.

Collaboration among students in form of exchanging ideas, editing, proofreading, or commenting on each other's writing is highly encouraged.

Students are not allowed to use any generative AI technology or large language models, e.g. ChatGPT.

Learning Objectives

- Describe the principles of lipid distribution among cellular membranes.
- Recognize the endosomal pathway as a dynamic membrane system that is central to the distribution of nutrients and metabolites.
- Describe the role of lipids in the regulation of the endosomal pathway and signaling.
- Critically read and analyze current literature.
- Present scientific concepts and studies with and without formal presentation tools.
- Write a review of a scientific topic or research study, targeted to scientific, non-expert readers.
- Discuss scientific concepts and research openly and respectfully.
- Recognize the text elements of scientific articles and apply these concepts to own writing.

Course Content and Schedule

Week	Date	Lesson Topic(s)	Oral assignment	Written assignment
1	6 Sept	No Class		
2	13 Sept	Introduction of course		
3	20 Sept	Basic concepts of lipids and membranes	1 Oral presentation	
4	27 Sept		1 Oral presentation	
5	4 Oct	Membrane contact sites and lipid transfer proteins	2 Oral presentations	
6	11 Oct	Endosomes/Lysosomes	2 Oral presentations	
7	18 Oct	Small group exercise in experimental planning		Research summary Due Oct 18
8	25 Oct	Oral presentation of experimental approach		Experiment proposal Due Oct 27
9	1 Nov	TBA	2 Oral presentations	
10	8 Nov	TBA	2 Oral presentations	
11	15 Nov	No class: Study Break		Essay outline Due Nov 17
12	22 Nov	TBA	2 Oral presentations	
13	27 Nov	Wrap up		Final essay Due Dec 4

University Policies and Statements

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel, and support. Visit or e-mail the Indigenous Student Centre at 1321 Edward St or elders@dal.ca. Additional information regarding the Indigenous Student Centre can be found at: https://www.dal.ca/campus_life/communities/indigenous.html

Internationalization

At Dalhousie, 'thinking and acting globally' enhances the quality and impact of education, supporting learning that is "interdisciplinary, cross-cultural, global in reach, and orientated toward solving problems that extend across national borders." Additional internationalization information can be found at: <https://www.dal.ca/about-dal/internationalization.html>

Academic Integrity

At Dalhousie University, we are guided in all our work by the values of academic integrity: honesty, trust, fairness, responsibility, and respect. As a student, you are required to demonstrate these values in all the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity. Additional academic integrity information can be found at: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Student Accessibility Centre is Dalhousie's centre of expertise for matters related to student accessibility and accommodation. If there are aspects of the design, instruction, and/or experiences within this course (online or in-person) that result in barriers to your inclusion, please contact the Student Accessibility Centre (https://www.dal.ca/campus_life/academic-support/accessibility.html) for all courses offered by Dalhousie with the exception of Truro. For courses offered by the Faculty of Agriculture, please contact the Student Success Centre in Truro (<https://www.dal.ca/about-dal/agricultural-campus/student-success-centre.html>)

Conduct in the Classroom – Culture of Respect

Substantial and constructive dialogue on challenging issues is an important part of academic inquiry and exchange. It requires willingness to listen and tolerance of opposing points of view. Consideration of individual differences and alternative viewpoints is required of all class members, towards each other, towards instructors, and towards guest speakers. While expressions of differing perspectives are welcome and encouraged, the words and language used should remain within acceptable bounds of civility and respect.

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness (Strategic Priority 5.2). Additional diversity and inclusion information can be found at: <http://www.dal.ca/cultureofrespect.html>

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner - perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution. The full Code of Student Conduct can be found at:

https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Fair Dealing Policy

The Dalhousie University Fair Dealing Policy provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at Dalhousie. Additional information regarding the Fair Dealing Policy can be found at:

https://www.dal.ca/dept/university_secretariat/policies/academic/fair-dealing-policy-.html

Originality Checking Software

The course instructor may use Dalhousie's approved originality checking software and Google to check the originality of any work submitted for credit, in accordance with the Student Submission of Assignments and Use of Originality Checking Software Policy. Students are free, without penalty of grade, to choose an alternative method of attesting to the authenticity of their work and must inform the instructor no later than the last day to add/drop classes of their intent to choose an alternate method. Additional information regarding Originality Checking Software can be found at:

https://www.dal.ca/dept/university_secretariat/policies/academic/student-submission-of-assignments-and-use-of-originality-checking-software-policy-.html

Student Use of Course Materials

Course materials are designed for use as part of this course at Dalhousie University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as books, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law. Copying this course material for distribution (e.g. uploading to a commercial third-party website) may lead to a violation of Copyright law.