

EXSU684: Fall Term (3 credits)

Signal Transduction: Mechanisms and Disruptions in Disease

Place: Offered Online via Zoom
Time: Thursdays 9:00-11:00 AM
First Class: Beginning of September
Welcome and Introduction to Signal Transduction

Course Coordinators:

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Course Description:

This is an in-depth course aimed at students with a keen interest in signal transduction.

Learning objectives:

- (i) To achieve a good command of the signal transduction language;
- (ii) To describe common signaling pathways and their networks;
- (iii) To develop skills to critically evaluate and synthesize information from research papers in the field.

The course topics include:

1. Signaling by Receptor Tyrosine Kinases
2. Signaling by G-Protein Coupled Receptors
3. JAK/STAT Signaling
4. TGF- β /Smad Signaling
5. TLR Signaling
6. Nuclear Receptors
7. Autophagy Signaling Pathways
8. Phosphatases in Signal Transduction
9. Reactive Oxygen Species (ROS) Signaling Mechanisms
10. Hippo–YAP/TAZ signaling
11. Apoptosis Signaling Mechanisms

Course Format: The lectures are held on Thursdays from 9-11 AM. The first hour will be devoted to a lecture by an expert in the field to provide participants with a general conceptual understanding of the specific signaling mechanism in question. The second hour will be a “journal club” discussing a recent paper of the lecturer’s choice that has significantly impacted the field.

Class Participation: Each professor scheduled in the course will provide an article one week in advance which will be discussed in class. All students are expected to read the assigned article and be prepared to actively participate and contribute.

Student Presentations: Students will select an article from a list of approved journals and give an oral presentation on the article in class. The oral presentation will be 15 minutes followed by a 5 min question/answer period. **Due dates:** Title and Reference: **Early October**. Presentation: **Late November**.

Written Assignment: The students will write a brief research proposal in which they propose future research based on the article they presented in class. The research proposal should be 4 pages in length excluding references and should include the following sections: background, hypothesis, specific aims, expected outcomes, limitations, alternate strategies, and relevance. Due date: **Beginning of December**.

Final Examination: Final examination (short answers and essays) **Mid-December : 40%**

Learning Outcome Measurement: The course grade will be based on the following distribution: Class Participation: 15%, Final examination: 40%, Oral presentation: 20% and Written Report: 25%.

Disclaimer

McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism, and other academic offenses under the Code of Student Conduct and Disciplinary Procedures (see www.mcgill.ca/integrity for more information).