

Department of Physiology
PHGY 488 – Stem Cell Biology (3 credits)
Course Schedule Fall 2017

Time: Monday and Wednesday from 1:35pm – 3:25pm

Place: McIntyre Medical Science Building, Room 1101

Course Coordinator: Dr. A. Nijnik, Bellini Bldg., Room 368

Date	Day	Lecture Title	Lecture	Lecturer
Part I				
Sept. 06	Wed	Introduction to Stem Cell Biology and an Overview of the Course	1	Dr. A. Nijnik
Sept. 11	Mon	Hematopoietic Stem Cells Sign up for seminars @ 4:00 pm on MyCourses, only one partner	2	Dr. A. Nijnik
Sept. 13	Wed	Transcriptional Regulation of Stem Cell Pluripotency and Self-Renewal	3	Dr. A. Nijnik
Sept. 18	Mon	Seminar Class I – Introduction to HSCs & Transcriptional Regulation	4	Dr. A. Nijnik
Sept. 20	Wed	Maintenance of Stem Cell Genomic Stability	5	Dr. A. Nijnik
Sept. 25	Mon	Seminar Class II – Stem Cell Genomic Stability	6	Dr. A. Nijnik
Sept. 27	Wed	Components and Activities of Hematopoietic Stem Cell Niche	7	Dr. A. Nijnik
Oct. 02	Mon	Seminar Class III – Hematopoietic Stem Cell Niches	8	Dr. A. Nijnik
Oct. 04	Wed	Pathways of Hematopoietic Stem Cell Differentiation <i>Term paper topics posted on myCourses for review <u>only</u>.</i> <i>Sign up begins on <u>Thursday, October 12 starting at 9:00am.</u></i>	9	Dr. A. Nijnik
Oct. 11	Wed	Cancer Stem Cells: Concept, Properties, and Implications for Therapy	10	Dr. L. McCaffrey
Oct. 16	Mon	Seminar Class IV – Cancer Stem Cells	11	Dr. L. McCaffrey
Oct. 18	Wed	Hematological Malignancies and Leukemia Stem Cells	12	Dr. K. Eppert
Part II				
Oct. 23	Mon	Embryonic Stem Cells	13	Dr. Y.Yamanaka
Oct. 25	Wed	Induced Pluripotent Stem Cells and Molecular Basis of Reprogramming	14	Dr. Carl Ernst
Oct. 30	Mon	Muscle Satellite Cells	15	Dr. C. Crist
Nov. 01	Wed	Seminar Class V – Muscle Satellite Cells	16	Dr. C. Crist
Nov. 06	Mon	Intestinal Crypt Stem Cells	17	Dr. A. Nijnik
Nov. 08	Wed	Stem Cell Populations of the Skin	18	Dr. A. Nijnik
Nov. 13	Mon	No Class – please attend the Symposium of the McGill Stem Cell and Regenerative Medicine Network – further info to follow	-	-
Nov. 15	Wed	Methodologies for the Study of Tissue Stem Cells - Revision	19	Dr. A. Nijnik
Nov. 20	Mon	Neural Stem Cells	20	Dr. S. Stifani
Nov. 22	Wed	Mesenchymal Stem Cells	21	Dr. N Eliopoulos
Nov. 27	Mon	Clinical Applications: Cellular Therapies for Diabetes	23	Dr. Hoesli
Nov. 29	Wed	Seminar Class VI – Mesenchymal Stem Cells	22	Dr. N Eliopoulos
Dec. 04	Mon	Ethics of Stem Cell Research and Clinical Use	24	Dr.J.Kimmelmann
Dec. 06	Wed	No Class	-	-

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OBJECTIVES

- To learn the main concepts in stem cell biology. This will include the following topics: embryonic stem cells, induced pluripotent stem cells, cancer stem cells, stem cells populations of many adult tissues, applications of stem cell biology, and ethical issues surrounding stem cell use in research and medicine.
- To learn about the major experimental methods and laboratory techniques in stem cell biology.
- To improve the students' abilities to critically read peer-reviewed journal papers, give oral presentations of scientific material, and participate in group discussions.

METHOD

As indicated in the table above, the course will consist of **18 x 2 hour lectures** and **6 x 2 hour seminar** classes. Topics introduced by the instructors in the lectures will be reinforced by presentations and discussions of recent research-papers in the seminar classes.

READING

All material will be presented in lectures and seminars. For each seminar, 2 recent research-papers will be assigned as reading for the whole class, and then presented and discussed in class by groups of 2 students per paper, (assuming full enrollment of 24 students in the class).

EVALUATION

Students will be assessed by term-paper (25%), final exam (50%), seminar sessions (25%, including 5% for class participation).

1. **Seminar:** Sign up for the seminars will be on **Monday, Sept 11 @ 4:00pm on MyCourses**. Each seminar class will consist of two seminar presentations, each one presented by a group of 2 students, (1 student may present without a partner if the number of enrolled students in the class is not even). Both students in the pair will receive the same mark. **ONLY ONE of the partners** must sign up for the Seminar you wish to present. Once you have signed up, please email the course secretary @ undergrad2.physiology@mcgill.ca with the name of your partner. INSTRUCTIONS on how to sign up will be provided on myCourses. The seminar presentations will be based on a research paper chosen by the lecturer and designed to reinforce and extend the knowledge of the material from the most recent lectures.

The seminar should be a maximum of **25 minutes**, followed by **15 minutes** for discussion and questions. It is recommended that you prepare a powerpoint presentation.

Your seminar should be organized like a research paper, including such sections as Introduction to the Research Question, Experimental Methodology and Results, Discussion and Conclusions.

Critical analysis of the paper is essential. Do the experimental results justify the conclusions of the paper? Is the research methodology appropriate and do the experiments include all the necessary controls? Are there any other experiments you would suggest to reinforce the conclusions of the paper? What are the remaining unanswered questions and suggested follow-up work?

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2. **Term Paper:** Topics will be posted on *myCourses* for your review on **Wednesday, October 4th**. Decide on **one** choice and sign up on *myCourses* on **Thursday, October 12 starting at 9:00am**. (Spaces are limited) **ONLY ONE assignment can be chosen**. Term paper will be due **Friday, December 1st @ 4:00pm** in the general office room 1021. Students will be assigned a number of recent journal papers that had a major impact on the field of Stem Cell Biology, and from this list they will have to select one paper as a subject for their term paper. In the term paper, the students will be expected to provide a critical analysis of the contents of the paper and its impact on the field of Stem Cell Biology. This includes: **1)** defining the key question or hypothesis addressed by the paper; **2)** reviewing the background literature that preceded the paper to explain why this question is important and perhaps controversial; **3)** critically analyzing the data presented in the paper to support the hypothesis and highlighting the strengths and the limitations.

The term papers will be up to **5 pages** in length, single-spaced. Page limits will be strictly enforced. Additionally the paper may include 1 page of figures designed to illustrate key concepts and help with the discussion. It is preferable that you prepare your own figures; however, if you are using a figure from another source, such as a review article, this has to be clearly cited. You are also expected to attach a list of references, in a format of any major biomedical journal. The reference list has no page limit and does not count towards the 5 page limit of the paper.

3. **Exam:** The exam will consist of a mixture of short answer questions and broad essay-type questions. The exam is based on the lectures of the course. No detailed knowledge of the papers presented in the seminars is expected; however, the seminar discussions will reinforce and extend the knowledge of the concepts already covered in the lectures.

GRADING:

*The Department of Physiology will **NOT** revise/upgrade marks except on sound academic grounds. Once computed, the marks in this course will **NOT** be altered/increased arbitrarily. Decimal points will be “rounded off” as follows: if the final aggregate mark is computed to be 79.5%, the mark will be reported as 80% (an A-); a final aggregate mark of 79.4% will be reported as 79% (a B+). These marks are **FINAL and NON-negotiable**.*

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

In accord with McGill University’s Charter of Students’ Rights, students have the right to submit in English or in French any written work that is to be graded (except in courses where knowledge of a language is one of the objectives of the course).

In the event of extraordinary circumstances beyond the University’s control, the content and/or evaluation scheme in this course is subject to change.

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