

MEDG 421: Genetics and Cell Biology of Cancer

9 Jan 2024 – 11 Apr 2024

Time and Location:

Lectures are, 9:30am-10:50am, Tuesdays and Thursdays in FNH50.

http://maps.ubc.ca/PROD/index_detail.php?locat1=449

Instructors and Contacts:

Dr. Peter Stirling (pstirling@bccrc.ca)

Dr. Laura Evgin (levgin@bcgsc.ca)

Dr. Gregor Reid (grogreid@mail.ubc.ca)

Dr. James Lim (cjlim@mail.ubc.ca)

TA: Leticia Dinatto (ldinatto@bccrc.ca)

Course Description and Objectives:

"Molecular mechanisms of oncogenes and tumor suppressors and the effects of oncogenic mutations on the biology of cancer cells." A background in cell biology is assumed - **a grade of B or higher in BIOL 335 is strongly recommended**. It is assumed that students will have a firm understanding of cell biology and basic genetics, as such knowledge will be critical to the course material.

The course is designed to survey molecular oncology, introducing students to important concepts and themes in the biology of cancer cells. Due to the fast-paced nature of the area, material will be largely taken from recent journal publications and wherever possible presented by guest lecturers who are experts in a given topic area. This format should provide not only the facts of a research topic, but also highlight cutting-edge research approaches used by cancer researchers in Vancouver. Students are expected to develop skills in both searching and interpretation of scientific literature through assigned class readings and paper summaries. The midterm and final exams will be problem-based. In addition, a book club style-discussion and an oral paper summary are designed to promote interaction and communication.

The class is organized into four blocks. The first block focuses on the central concepts of cancer cell biology and genetics, providing a foundation of knowledge for the more specialized information in the subsequent blocks (see attached schedule of lectures). There will be **optional tutorial sessions** held off timetable (in the late afternoon or early evening) near the exam dates. Students may request assistance from the TA or instructors (contacts above) if they require additional support.

Text Book:

"The Biology of Cancer" by Robert A. Weinberg is **optional**. Most of the readings will come from assigned recent journal articles and reviews, although much of the material presented during the first two weeks draws from the text book. Links to all assigned readings and course material will be posted on CANVAS.

Lecture Schedule and Material:

Please see the course schedule on page 3 – lectures may be rescheduled depending on instructor availability. Lecture slides will be posted on the CANVAS class website usually **after** the lecture (although 1-2 lecturers may not release their slides). We will also try to record each meeting and post to the Cloud on CANVAS when lecturers agree to be recorded. You should attend class 'live' to participate in discussion and there is no guarantee that a lecture will be recorded.

Grading Scheme:

Paper summaries:	20% (Breakdown: 2%, 6%, 6%, 6%)
Oral paper summary:	10%
Book report/participation:	20%
Mid-term exam*:	25% (covers first half of the term)
Final exam*:	25% (non-cumulative – covers concepts from second half)

*Both the mid-term and the final exams will be open-book, open-note, and may be take-home.

Assignments:

Assignment details, due dates, and grading will be done on CANVAS. Below are guidelines for the assignments but for more details see CANVAS.

Article Summaries:

This first assignment is intended to provide you with feedback prior to the submission of subsequent reports. It will be weighted less than subsequent summaries in the marking. Before submitting a summary for a paper, you must register your choice using the class online registration page, as each paper may only be chosen by one student.

The paper registration system will be found at the following URL. Titles for paper registration may not match exactly what is discussed in class, just register by number (PS#1, then #2, etc): You can not do the same paper as another student, so register your paper selections by Pubmed ID here:

<https://forms.gle/VcPAaGetN5wK86oL6>

Oral paper summaries will take the form of a 5-7 minute presentation to a small group on the last two days of class. More details on this will come later in the term.

Book Report and Discussion Participation:

Students will be asked to read part of a popular science book on cancer. Students will select either *The Emperor of All Maladies* by Siddhartha Mukherjee, or *The Immortal Life of Henrietta Lacks* by Rebecca Skloot. Midway in the term (likely February 27th), we will hold a book discussion day, in which we will split into discussion groups to explore the topics raised in this book. Each student will be required to submit a two-page book report in the preceding class session. Links and details for this event will be discussed in class.

Disputing marks:

If you choose to dispute an assigned mark, you must submit the assignment or exam for re-grading **with a maximum 1-page explanation/justification of your disputed mark.** The entire work will be re-graded. Please note; in the past the re-marking has led to a net decrease in the assigned grade in some cases. If there is a mathematical error (i.e. we fail to add numbers correctly), you may bring it to the attention of the TA or instructor without a formal dispute.

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Lecture #	DATE	DAY	Topic	Lecturer
1	9-Jan-24	Tuesday	Introduction, mutation and cancer	Peter Stirling
2	11-Jan-24	Thursday	Cancer genes, and where to find them.	Peter Stirling
4	16-Jan-24	Tuesday	Multistep oncogenesis and immortality	Peter Stirling
5	18-Jan-24	Thursday	Hallmarks II / Concepts in Treatment	Peter Stirling
6	23-Jan-24	Tuesday	Cancer Models	Gregor Reid
7	25-Jan-24	Thursday	Cancer Genomics	Adi Steif
8	30-Jan-24	Tuesday	Biomarkers (& circulating tumour DNA)	Alex Wyatt
9	01-Feb-24	Thursday	Hypoxia and the TME	Kevin Bennewith
10	06-Feb-24	Tuesday	Cancer Immunology	Laura Evgin
11	8-Feb-24	Thursday	Cell Therapies	Amanda Li
12	13-Feb-24	Tuesday	Blood cancers & Lymphoma	Leandro Venturutti
13	15-Feb-24	Thursday	TUTORIAL > take home exam	-
14	20-Feb-24	Tuesday	READING WEEK	
15	22-Feb-24	Thursday	READING WEEK	
16	27-Feb-24	Tuesday	Book club discussion	-
17	29-Feb-24	Thursday	The tumor microenvironment	James Lim
18	05-Mar-24	Tuesday	Tumour invasion and metastasis	Karla Williams
19	7-Mar-24	Thursday	Clinical Pathology and Biobanking	Jonathan Bush
20	12-Mar-24	Tuesday	Cancer Stem Cells	Chris Maxwell
21	14-Mar-24	Thursday	Pediatric neurooncology	Sylvia Cheng
22	19-Mar-24	Tuesday	TBD	
23	21-Mar-24	Thursday	TBD	
24	26-Mar-24	Tuesday	TBD	
25	28-Mar-24	Thursday	TBD	
26	02-Apr-24	Tuesday	TBD	
27	04-Apr-24	Thursday	TBD	
28	9-Apr-24	Tuesday	Oral Presentation	
29	11-Apr-24	Thursday	Oral Presentations / course debrief	