Oncological Sciences Upper level courses 2013-2014

- Oncological Sciences graduate students take one and a half semesters of electives beyond their previous core curriculum.
- At least half a semester is required to be an Advanced Seminar.
- Upper level courses offered by Oncological Sciences are described below; courses from other departments may also be of interest.
- Consult with your PI and your thesis committee to design the best individual training plan.
- All grad students should actively participate in a Journal Club (Transcription or Cancer Biology are the main choices), although in later years you do not sign up for credit.

FALL - 2013 (1st half semester) August 26 – October 11

FALL - 2013 (2nd half semester) October 21 – December 13

ADVANCED SEMINAR
Metastasis
ONCSC / 6720-001
Course Leaders: Alana Welm & Rodney Stewart

Spontaneous spreading of tumor cells to distant organs, known as metastasis, is the leading cause of death in cancer patients. Understanding how metastasis occurs is critical for success in developing therapies that prevent dissemination of tumor cells and/or destroy secondary tumors. In the last decade, a number of new discoveries have greatly contributed to our understanding of metastasis at the cell biological and molecular level. Importantly, these findings provide the framework for future genetic, molecular and biochemical studies to fully elucidate the mechanisms underlying metastasis and how these mechanisms could be subverted for therapeutic intervention. In this course we will cover known molecular and cellular mechanisms of metastasis, and will discuss the implications for drug development and clinical care.
SPRING – 2014 (1st half semester) January 6 – February 25

SPECIAL TOPICS
Physiology & Medicine for the Molecular Biologist
ONCSC / 6520-001
Course leaders: Dean Li & Kevin Whitehead

The goal of this course is to provide graduate students in the basic sciences with a richer understanding of human physiology and pathophysiology. This information is critical for understanding the importance of any molecular mechanism at the level of cells, organs and whole animals, and applying this information to humans.

This course is aimed for students interested in:
1. Gaining an understanding on the broad implications of their research and basic science.
2. Learning how their focus in molecular mechanisms translates to medical interventions.
3. Obtaining a foundation in anatomy and physiology necessary that is critical for understanding how to characterize genetic engineered animal models
4. Preparing themselves scientifically for careers in biotech or pharma industry.

We will teach the anatomy, physiology and pathophysiology relevant to a given organ system (heart, lung, kidney etc.). The relationship between molecular mechanism, pathophysiology and medicine will be emphasized. Each sections will be organized into three-1 hour lectures. Lectures will include up to date molecular details of interest and relevance to this audience. Though the course will utilize a textbook, McCance and Huether Pathophysiology, class participation is key as we will synthesize information to develop therapeutic strategies of today and tomorrow.

SPRING - 2014 (2nd half semester) February 26 – April 23

DIDACTIC
Clinical Biology of Cancer
ONCSC / 6500-001
Course leaders: Adam Cohen, Mike Engel, Kevin Jones & Matt Topham

Course Aim: In this course, participants will be provided with the clinician’s look at cancer: How is the diagnosis made at the level of clinical exam, through imaging modalities and modern molecular tests? What are new developments in treatment modalities available to the surgeon, radiotherapist and oncologist? What are genetic risk factors and how should families be counseled? A number of specific solid tumors and leukemias will be discussed and emphasis will be placed on bench-to bedside efforts. The course is designed for graduate students and post-doctoral fellows in basic science departments with an interest in modern principles and practice of oncology, and complements the Molecular Mechanisms of Cancer course offered in alternating years.

Prerequisite: Concurrent enrollment or equivalent 1st year Cell Biology, Molecular Biology and Genetics.
SPECIAL TOPICS
Utilization of Animal Models in the Development of Clinical Models
ONCSC / 6520-002
Course Leaders: Dean Li & Kirk Thomas

It is now possible to precisely modify any DNA sequence within the genome of the mouse. This course emphasizes using mouse models to dissect the genetic basis of human disease. Modification of genes using homologous recombination will be covered extensively as will other methods of gene inactivation (anti-sense constructs, inhibitory RNA, etc.). New experimental systems for modeling human disease in zebrafish and drosophila will also be covered. We will use genes of interest from clinical and scientific studies of the class participants as examples (e.g. If you want to knockout a gene for your project, in preparation for your prelims or scientific edification—we will develop the strategy).
2013-2014 Journal Clubs

Transcription Journal Club
ONCSC / 7700-001
Course Leader: Brad Cairns

The Transcription Journal Club is an opportunity for colleagues interested in transcriptional biology to present, learn, and discuss work of importance in the field. Topics include chromatin structure and regulation, transcription factor/signaling interfaces, transcriptional regulation in development, RNAi interference, epigenetics, genomics approaches, dosage compensation, and the misregulation of transcription in cancer. The format involves weekly article presentations and monthly research talks, with pizza and drinks provided at the research talks.

Cancer Biology Journal Club
ONCSC / 7700-002
Course Leaders: Mike Engel & Rod Stewart

The Cancer Biology Journal Club will review recent advances in the cancer field. There will be four topics discussed throughout the year. Each topic will focus on a particular “theme” in cancer biology, such as metabolism, tumor resistance mechanisms, cancer stem cells, metastasis, tumor microenvironment, angiogenesis, etc. The normal physiology, the cancer relevant alterations in the pathway, and the clinical translation of the topic will all be emphasized. One strength of the Journal Club is the participation of young trainees from different fields, at different stages of training, and with different career goals. Thus, while we welcome all members of the community, our emphasis will be to actively engage graduate students and post-docs in the bi-weekly discussions by creating an environment that encourages active discussion of the presented material.

The journal club will meet bi-weekly, with each meeting focusing on one particular paper. At each meeting, one trainee will present a 10 minute Introduction to the paper, followed by presentation of an individual figure by one of the trainees, chosen at random for each figure, and then discussion of the overall conclusions of the study. Graduate students present once a year, and post-docs are scheduled into the remaining slots.

Cell / Developmental Biology Journal Club
ONCSC / 7700-008
Course Leader: Jody Rosenblatt

The Cell/Developmental Biology Journal Club is a forum for discussion about current papers of general interest to the cell/developmental/cancer biology community. Topics may include signal transduction pathways, nucleo-cytoplasmic transport, cell cycle control, cell adhesion, developmental morphogenesis, stem cell biology, and cytoskeletal organization and regulation. This club will meet every two weeks on alternative weeks with the Cancer Biology Journal Club so participants can double dip, if they like. Papers for presentation will be chosen by the presenter and vetted by faculty (Jody Rosenblatt, Katie Ullman, Bryan Welm, Julie Kadrmas, Doug MacKay, and Mark Smith). Presenters are encouraged to present on something related to their own work, so that they get good feedback relevant to their studies. In order to stimulate as much discussion as possible and develop good presentation skills, those not presenting are not required to read the paper beforehand. Enrollment for this journal club will be capped at 15 so each person presents one time per year. Of course, others may attend.