Biology of Cancer
BIOL4010 3.0, Fall 2008-9

The main objective of the Biology of Cancer course is to develop the understanding of the basic molecular and cellular concepts and principles related to the development of cancer, and its medical application to treatment and prevention.

The course examines molecular and cellular aspects that affect the development of cancer in humans, approaching DNA mutations and viral infections as major causes of the disease. Furthermore, the course will illustrate rational treatments and preventions for cancer.

Pre-requisites: SC/BIOL 3130 3.00 or SC/BCHM 3130 3.00.

Course Schedule and Location
Mondays between 2:30 to 5:30 pm at CLH F

Course Co-Directors

Dr. Samuel Benchimol
Room 243A, Farquharson
E-mail: benchimo@yorku.ca
Office hours: E-mail to set an appointment

Dr. Motti Anafi
Room 319, Farquharson
E-Mail: movanafi@yorku.ca
Office hours: E-mail to set an appointment
Grading:
Mid-Term Exam 1 25%
   Date: October 20, 2008 @ 2:30pm
   Location: TBA
Mid-Term Exam 2 25%
   Date: November 17, 2008 @ 2:30pm
   Location: TBA
Final Exam 50%
   Date and location: will be published by the registrar office

Please note that this information is subjected to in-class update.

Required Readings (Review articles)

These articles will be placed on electronic reserve
Please note that this information is subjected to in-class update.

Recommended Readings (textbook):
The Biology of Cancer, by Robert A. Weinberg (2007)
Publisher: Garland Science
ISBN 0-8153-4076-1 (available at York University bookstore)
Course Outline

Part 1: The Nature of Cancer (Dr. Anafi)
- Tips on studying for the course
- Normal and abnormal cell division
- The development of tumours from normal tissues
- The hallmarks of cancer
- Invasion and metastases
- Retroviruses and the discovery of oncogenes
- Cancer epidemiology

Part 2: Oncogenes (Dr. Anafi)
- Activation of protooncogenes in human cancer
- Tyrosine kinases as cellular oncogenes
- G proteins and uncontrolled proliferation
- Transcription factors and neoplastic transformation

Part 3: Tumour Suppressor Genes (Dr. Benchimol)
- Identification of tumour suppressor genes
- pRb: cell cycle regulation and cancer
- Two pathways of apoptosis
- p53 and Bcl2: The evasion of apoptosis
- Cancer as an inherited disease

Part 4: Infection and Cancer (Dr. Anafi)
- Inflammation and human cancer
- Papilloma viruses and Cervical Neoplasia
- Hepatitis viruses and liver cancer
- AIDS-Associated Cancers

Part 5: The Rational Treatment of Cancer
- The path from Abelson leukemia virus to Gleevec (Dr. Anafi)
- Targeting cells defective in the p53 pathway (Dr. Benchimol)
- What's next? (Drs. Benchimol & Anafi)
Tips on studying for this course:

- For the exams, you must know and understand the material presented in the lectures and in the required reading mentioned above.
- You are NOT expected to know material from the textbooks which has not been covered in the lectures.
- The textbooks can help students consolidate and expand their understanding of the material. However, some parts of the textbooks will not be covered in class, and other material that will be covered in class will not be discussed in the above textbooks. Hence, it is important to attend the lectures, and, in addition, to read the sections in the textbook related to each topic as it is covered in the course.
- Use the texts as auxiliaries to the lecture material, not the other way around.
- Students who miss a lecture are expected to borrow the relevant notes from a classmate and to study the corresponding chapter in the textbook and from the required readings. It is your responsibility to attend class as lecture notes will not be provided.
- The material presented in the lectures and other components of the course such as tests and exam have been developed from large variety of resources, including web sites, textbook supplements and the material mentioned above.

Tests and Exams:

Attendance for all exams is mandatory. Exams missed on the ground of medical circumstances must be supported by an Attending Physician’s Statement, which can be downloaded from:

http://www.registrar.yorku.ca/pdf/petitions/attending_physician_statement.pdf, or a statement by a psychologist or counsellor. Students are NOT expected to disclose the nature of the illness. The document must specify:

1) date of consultation.
2) contact information (e.g. phone number of the hospital; legible name of the health provider) that would allow verification of the document.
3) a statement that the student would not have been able to attend class (or carry out activities) during the relevant period of time.

The documentation must be dated on the same day as the exam or earlier, or it will not be accepted. The Course Director must be notified by email within 24 hours in the case of a missed test or exam. Appropriate documentation must be submitted to the Course Director within one week after the test or exam. No opportunities to make up missed mid-term exams will be offered. However, after acceptable
justification for a missed exam has been received, the percentage value of the missed mid-term will be added to the final exam. If the final exam is missed, the student must petition the Registrar for permission to write the final exam.

**Accommodations:**

Students who feel that there are extenuating circumstances that may interfere with the successful completion of their exams or other course requirements are encouraged to discuss their concerns with the Course Director as soon as possible.

Students with physical, learning or psychiatric disabilities who require reasonable accommodations in teaching style or evaluation methods should discuss the matter with the Course Director early in the term so that appropriate arrangements can be made.

**Cheating and Plagiarism:**

Cheating and plagiarism are major academic offences and carry serious penalties, ranging from a failing grade on the work in question to expulsion from the university. For more details about cheating, see York University's academic dishonesty policy at the following link:

http://www.yorku.ca/secretariat/legislation/senate/acadhono.htm

**Sending e-mail to the Course Directors**

Your e-mail will be read and answered as soon as possible. However, we will open only e-mails that fulfill the following requirements:

- Your e-mail must be sent from your yorku.ca email account (not from hotmail, gmail etc.) - emails from non-yorku.ca accounts will likely languish in a spam folder that is checked only intermittently.
- Be sure to include your full name and student number in your email text.
- Your e-mail must include "BIOL/4010" in the subject line
- Your e-mail must NOT include an attachment.

**Important Dates:**

- Last day to ENROL without requiring the permission of the Course Director is Sep 18, 2008.
- Last day to ENROL even with the permission of the Course Director is Oct 3, 2008.
- Last day to DROP the course without a grade being submitted is Nov 7, 2008.