Biochemistry 4450A Molecular Genetics of Human Cancer
In-class (Section 001) and E-Course (Section 650)
Department of Biochemistry, Schulich School of Medicine and Dentistry, Western University

Course Description and Goals:
Key cellular pathways that are frequently subverted in tumour cells will be discussed, as will mechanisms by which environmental factors affect tumour development. Cancer models and molecular therapies will also be investigated and related to the cancer hallmarks. This course has two sections, including a traditional in-class, face-to-face section (001) as well as an online section (650). Students can access the lectures in real-time or via the course's OWL site, where the lectures will be archived throughout the term for all students.

Biochemistry 4450A Learning Outcomes (L.Os.):
Upon completion of the course students should be able to:
1. Demonstrate a critical understanding of recent breakthroughs and advances in our understanding of the causation and treatment of multiple types of cancer. Students will be able to understand and evaluate news reports and new breakthroughs reported in the popular press in proper scientific context.
2. Interpret and explain detailed, current knowledge about the molecular mechanisms and abnormalities responsible for cancer development.
3. Critically evaluate diverse information sets related to cancer; offer opinions and exhibit theoretical understanding of novel treatment scenarios.
4. Clearly communicate technical concepts and experimental results to diverse audiences in writing, in a style consistent with practice in the field.

Prerequisites: Biology 2581b, Biochemistry 3381

Undergrad Administrator: TBA
Location: MSB Room 342 (Biochemistry Office)
Email: TBA Phone: (519) 661-3074

Course Coordinator: Dr. David Rodenhiser
(and Instructor)
Location: Victoria Hospital/Cancer Program; Vic A4-134
Email: drodenhi@uwo.ca Phone: 519-685-8600 X52198

Instructor: Dr. Fred Dick
Location: Victoria Hospital/Cancer Program; Vic A4-136
Email: fdick@uwo.ca Phone: 519-685-8600 X53027

Course material: All course material, including scholarly research papers and reviews, and the lecture notes in pdf format will be accessible from the course’s OWL site (under ‘Resources’).
All lectures are recorded ‘live’ by webcam for viewing, and are also archived on the course's OWL site (under ‘Collaborate CV’).
Students will also be provided with additional short video and web-based news articles prior to lectures (referred to as ‘Appetizers’) that will offer news-based, scientific context to the upcoming lectures, for the students to peruse prior to class.

Required Textbook: no required textbook

Draft Syllabus: July 6, 2017
**Lecture Timeline:** including the links between assessments and the course’s Learning Objectives (L.O.). This is a **general timeline** which will be finalized by Sept 1, 2017.

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture</th>
<th>Details</th>
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| Sept 7 | lecture 1: | Course Introduction and Cancer 'by the Numbers'  
Dr. Rodenhiser |
| Sept 12 | lecture 2: | The Hallmarks of Cancer  
Dr. Rodenhiser |
| Sept 14 | lecture 3: | The 'Cancer Genes' I  
Dr. Dick |
| Sept 19 | lecture 4: | The 'Cancer Genes' II  
Dr. Dick |
| Sept 21 | lecture 5: | Cancer Genomics and lessons in cBioPortal  
Dr. Dick |
| Sept 26 | lecture 6: | Model organisms used in Cancer Biology  
Dr. Dick |
| Sept 28 | lecture 7: | Multistage Progression  
Dr. Dick |
| Sept 29 | **Interactive Links topics due** (linked to L.O. #1 and #4) |
| Oct 3 | lecture 8: | Immortality and Senescence  
Dr. Dick |
| Oct 5 | lecture 9: | Genome Integrity I: Apoptosis  
Dr. Dick |
| Oct 6 | **Take home Quiz using cBioPortal to problem solve** (linked to L.O. #2) |
| Oct 17 | lecture 10: | Genomic Instability: enabling Cancer progression  
Dr. Dick |
| Oct 19 | lecture 11: | DNA Repair: Overview and Concepts  
Dr. Dick |
| Oct 24 | lecture 12: | DNA Repair Errors in Specific Cancers I  
Dr. Dick |
| Oct 26 | lecture 13: | DNA Repair Errors in Specific Cancers II  
Dr. Dick |
| Oct 30 | **Midterm: 2 hours on topics from Lectures 1-13** (linked to L.O. #2 and #3) |
| Oct 31 | lecture 14: | Gene-Environment Interactions  
Dr. Rodenhiser |
| Nov 2 | lecture 15: | Cancer Epigenetics  
Dr. Rodenhiser |
| Nov 7 | lecture 16: | Targeting the Cancer Epigenome  
Dr. Rodenhiser |
| Nov 9 | lecture 17: | Metastasis and Angiogenesis  
Dr. Rodenhiser |
| Nov 14 | lecture 18: | The Challenges of Heterogeneity  
Dr. Rodenhiser |
| Nov 16 | lecture 19: | Targeting a Moving Target: Making It Personal  
Dr. Rodenhiser |
| Nov 21 | lecture 20: | Molecular Diagnostics and Counselling  
Dr. Rodenhiser |
| Nov 23 | lecture 21: | New Cancer Therapies I: ‘Essential’ Pathways  
Dr. Rodenhiser |
| Nov 24 | **Mini-Review / Term Paper due** (linked to L.O. #2 and #3) |
| Nov 28 | lecture 22: | New Cancer Therapies II: Immunotherapies  
Dr. Rodenhiser |
| Nov 30 | lecture 23: | New Cancer Therapies III: Viral therapies  
Dr. Rodenhiser |
| Dec 5 | Final Talk: | Review, Summing up, Feedback  
Dr. Rodenhiser |
| TBA | **Final exam 3 hours on ALL topics from Lectures 1-23** (linked to L.O. #1, #2, #3 & #4) |

**Evaluation:**

- Interactive Links': (5%)  
- Quiz: (10%)  
- Midterm: (25%)  
- Term paper: (15%)  
- Final: (45%)

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Exams: See [http://www.registrar.uwo.ca/applying/distance_studies/examinations.html](http://www.registrar.uwo.ca/applying/distance_studies/examinations.html) for information regarding Distance Studies Examinations.

**NB:** If you need to change the location of your exam you need to contact the Distance Studies office at least 3 weeks prior to the exam date at 519-661-2111 ext. 84879 or [distexam@uwo.ca](mailto:distexam@uwo.ca).

It is each student's responsibility to determine where she/he is to write each examination and to appear at the designated room on time. Students must provide their own pens, pencils (HB) and erasers for the examination.

No student will be allowed to write an examination without either a [Western ONECard](http://www.uwo.ca/wone/) student ID or another piece of government-issued photo identification. Electronic devices, including (but not limited to) calculators, cell phones and iPads are NOT allowed in the exam room.

**Missed test/examination:** “Students who are unable to write a scheduled midterm test must inform their instructor and provide proper documentation to their academic counsellor. If approval is made for a make up test and your exam centre is in London, your instructor will arrange the time and location of your rewrite. If you are writing at an off-campus exam centre, you must contact Distance Studies office if your make up test is approved to arrange your rewrite. Students will be required to pay an off-campus make-up exam fee.”

**Academic Offenses:** All students are responsible for reading the list of Academic Rights and Responsibilities at the following website: [http://www.westerncalendar.uwo.ca/2016/pg111.html](http://www.westerncalendar.uwo.ca/2016/pg111.html). Infractions may result in a grade of zero on the exam in question.

**Useful Links**

Office of the Registrar – Distance Studies

Academic Counselling (Science and Basic Medical Sciences):
[http://www.uwo.ca/sci/undergrad/academic_counselling/index.html](http://www.uwo.ca/sci/undergrad/academic_counselling/index.html)

Student Center: [https://student.uwo.ca/psp/heprdweb/?cmd=login](https://student.uwo.ca/psp/heprdweb/?cmd=login)

Student Development Centre: [http://www.sdc.uwo.ca/](http://www.sdc.uwo.ca/)

Student Health Services: [http://www.health.uwo.ca/](http://www.health.uwo.ca/)

Students who are in emotional/mental distress should refer to MentalHealth@Western [http://www.uwo.ca/uwocom/mentalhealth/](http://www.uwo.ca/uwocom/mentalhealth/) for a complete list of options about how to obtain help.

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