

The Molecular Biology of Cancer – Term II 2019

Molecular Biology 4H03/6H03

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Lectures: **Monday:** 11:30am - 12:20pm (BSB 117)
 Wednesday: 11:30am - 12:20pm (BSB 117)
 Friday: 1:30 am - 2:20pm (BSB 117)

Tutorials: **Section T01:** Wednesday: 1:30 pm - 2:20 pm (GS 102)
 Section T02: Monday: 10:30 am - 11:20 am (BSB 238A)

Course Objectives: To provide an overview of oncogenesis and its progression at the molecular and cellular level.

Textbook: Weinberg, R. A., *The Biology of Cancer, 2nd Ed.* Other material will be posted on “Avenue to Learn”. Material (movies, lectures, etc...) is also available on the publisher’s web site at (www.garlandscience.com)

E-book: The *Biology of Cancer* is also available as a downloadable e-book from VitalSource. Several purchase or rental options are available at <https://www.vitalsource.com/products/the-biology-of-cancer-robert-a-weinberg-v9781317963462>
The textbook is also available as an AMAZON KINDLE PRINT REPLICA e-book at <http://www.amazon.com> or from <http://www.garlandscience.com>

Assessment Scheme: Two in-class tests (50 minutes each) and a final exam (2.5 hours).
For 4H03, the mid-terms are each worth 20%, tutorials 15% and the final is worth 45%.
For graduate students taking the course as 6H03, the mid-terms are each worth 20%, the final 45%, and the research proposal is worth 15%.

NB. If one of the in-class tests is missed, the student must write a makeup midterm exam at a later date.

Please refer to the section below on the “*McMaster Student Absence Form*” for reporting your absence due to a minor medical reason.

Policy Reminders: Attention is drawn to the Statement on Academic Ethics and the Senate Resolutions on Academic Dishonesty as found in the Senate Policy Statements distributed at registration and available in the Senate Office. Any student who infringes one of these resolutions will be treated according to the published policy.

Tutorial Sessions:

The class will be divided into groups for tutorial sessions. Each tutorial group will meet every second week. Five problem sets will be provided during the semester and discussed in the tutorial sessions. Students will have ten days to provide the answers, which will then be reviewed the following week by the teaching assistants (TAs). Each problem set is worth 3% of the final grade. In total, the tutorials will be worth 15% of the final grade.

Requests for Relief for Missed Academic Term Work:

If you are absent from the university for a minor medical reason, lasting fewer than 5 days, you may report your absence, once per term, without documentation, using the *McMaster Student Absence Form*. Absences for a longer duration or for other reasons must be reported to your Faculty/Program office, with documentation, and relief from term work may not necessarily be granted.

When using the MSAF, report your absence to abedard@mcmaster.ca and whytep@mcmaster.ca normally within 2 working days. Please note that the MSAF may not be used for term work worth 30% or more, nor can it be used for the final examination.

Missing one of the tutorial assignments for a valid reason will result in a grade re-distribution of the remaining four tutorial assignments.

List of Topics for 2019

Monday	Jan	07	Introduction
Wednesday	Jan	09	Oncogenes and Proto-Oncogenes
Friday	Jan	11	Mechanisms of Oncogenic Activation
Monday	Jan	14	Receptor Tyrosine Kinases
Wednesday	Jan	16	Growth Factors, Chemokines and Secreted Factors
Friday	Jan	18	Non-Receptor Tyrosine Kinases
Monday	Jan	21	Ras signalling and Adapter Proteins
Wednesday	Jan	23	Tumour Suppressor Genes and Hereditary Cancer
Friday	Jan	25	Cytoplasmic Signaling Circuitry: PI3K-Akt/PKB
Monday	Jan	28	Cytoplasmic Signaling Circuitry: PI3K-mTOR
Wednesday	Jan	30	Cytoplasmic Signaling Circuitry: The MAP Kinase Cascade
Friday	Feb	01	Signal transduction by cell-cell interactions: FAK & Integrins
Monday	Feb	04	Energy metabolism in Cancer Cells
Wednesday	Feb	06	Regulation of Transcription Factor Activity I: AP-1
Friday	Feb	08	Regulation of Transcription Factor Activity II: NF- κ B
Monday	Feb	11	Regulation of Transcription Factor Activity III: Myc, Max & Mad
Wednesday	Feb	13	The Wnt Pathway

Friday Feb 15 Midterm I

(Mid-term recess – February 18 – 22, 2019)

Monday	Feb	25	The Epithelial-to-Mesenchymal Transition, Invasion and Tumour Initiating Cells
Wednesday	Feb	27	TGF- β signaling pathway
Friday	March	01	Notch pathway
Monday	March	04	Hedgehog pathway
Wednesday	March	06	Cyclins and Cyclin-Dependent Kinases
Friday	March	08	The Retinoblastoma Tumour Suppressor Gene
Monday	March	11	Transcription regulation by RB/E2F
Wednesday	March	13	The p53 Tumour Suppressor Gene
Friday	March	15	Regulation of p53 Response
Monday	March	18	Survival and Apoptosis

Wednesday March 20 Midterm II

Friday	March	22	DNA Tumour Viruses
Monday	March	25	Aneuploidy and Chromosomal Instability
Wednesday	March	27	DNA Damage Repair and Cancer
Friday	March	29	Multistep Tumour Development: Colon cancer
Monday	April	01	Multistep Tumour Development: Pancreatic cancer
Wednesday	April	03	New Strategies for targeted therapies
Friday	April	05	Targeted Therapies
Monday	April	08	Cancer Genomics and Personalized Therapy

Schedule of Tutorials in Mol. Bio. 4H03 – Term II 2019

Problems Sets will be uploaded on Avenue to Learn on the following dates:

Problem Set #1	January 7
Problem Set #2	January 21
Problem Set #3	February 4
Problem Set #4	February 25
Problem Set #5	March 11

Answers to Problem Sets are due IN CLASS on the following dates and times:

Problem Set #1	Monday, January 21	(12h20 pm)
Problem Set #2	Monday, February 04	(12h20 pm)
Problem Set #3	Monday, February 25	(12h20 pm)
Problem Set #4	Monday, March 11	(12h20 pm)
Problem Set #5	Monday, March 25	(12h20 pm)

Tutorials/Reviews of Problems Sets will take place on the following dates:

Problem Set #1	January 28 and 30
Problem Set #2	February 11 and 13
Problem Set #3	March 04 and 06
Problem Set #4	March 18 and 20
Problem Set #5	April 01 and 03