

**American University of Beirut  
Faculty of Arts and Sciences  
Department of Biology**

**BIOL 335-3 credits  
Molecular Biology of Cancer  
Fall 2010-2011**

**Instructor:** Nadine Darwiche, Ph.D.  
Biology Dept. Room 201  
Tel. Ext: 3926

**Meeting Time:** M-W 4:00 - 5:15 pm  
**Meeting Place:** AGRIC 310

**Office Hours:** M- 1:00 - 2:00 pm  
W- 2:00- 3:00 pm  
or by appointment

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**General Instructional Objectives**

At the completion of this course, a student will be able to:

- 1- Know principles and basic concepts of cancer development;
- 2- Understand applications of latest development in cancer research techniques;
- 3- Develop critical thinking skills in cancer research;
- 4- Know how to use library and on-line resources to research a current topic in the cancer field;
- 5- Judge the value of cancer research.

**Specific Learning Outcomes**

At the completion of this course, a student will be able to:

- 1.1- Describe how cancer arises at the cellular, molecular, genetic, and epigenetic levels;
- 1.2- Identify the specific kinds of genes altered in tumors, including oncogenes and tumor suppressor genes;
- 1.3- Analyze cell cycle regulatory, cell death, and cell signaling mechanisms in normal and tumor cells;

- 1.4- Explain how cancer spreads;
- 2.1- Prepare strategies to minimize cancer risk;
- 3.1- Analyze how current genetic developments in cancer biology could influence cancer management;
- 4.1- Write a research project and give an oral presentation in a recent area in cancer research;
- 5.1- Debate ethical and social implications of cancer research.

### **Resources Available to Students**

- Suggested Textbooks:  
The Biology of Cancer, R. A. Weinberg, Garland Science, 2007
- Our lectures will be available in PowerPoint formatting and lecture notes will be distributed.
- Additional readings from the literature are assigned.
- University library and on-line resources will be required for some topic assignments.

### **Grading Criteria**

Your grade will be based on four parts:

Attendance, class participation, and paper discussion	10%
Oral presentations	30%
Homework and exams	30%
Final project	30%

Discussion sections will cover original research papers or general review topics.

Take-home assignments will be given during the semester to provide familiarity with the research literature in cancer biology.

A required oral presentation reviewing a topic related to the biology of cancer and a primary research paper.

A final research proposal, outlining a series of experiments designed to investigate a recent topic related to the biology of cancer, will be submitted.

## **Schedule**

<b>Week</b>	<b>Topic</b>
1	Introduction and Course Outline
1 & 2	Cell Proliferation and Carcinogenesis
2 & 3	Cell Cycle Regulation
3	Cell Death: General Mechanisms
3 & 4	Apoptosis and Caspase-Mediated Cell Death The Bcl-2 Protein Family
5	Epigenetics and Cancer
6	Oncogenes Tumor Suppressor Genes
7	Metastasis: Introduction Tumor Cell Progression in Metastasis Organ Preference of Metastasis
8	Genetic Developments in Cancer Research: DNA Microarray Technology from Research to Diagnosis
8	Cancer Stem Cells
9	p53: Guardian of the Genome
Remaining weeks	Oral presentations and paper discussion

## **Guest Lecturers**

Drs.		
Ali Bazarbachi	Internal Medicine	bazarbac@aub.edu.lb
Marwan E. El-Sabban	Human Morphology	me00@aub.edu.lb
Rami Mahfouz	Pathology & Laboratory Medicine	rm11@aub.edu.lb
Rihab Nasr	Internal Medicine	rn03@aub.edu.lb
Raya Saab	Pediatrics & Adolescent Medicine	rs88@aub.edu.lb

## **Course Policy**

**Attendance:** Students are expected to attend all classes. This is an interactive course that is research oriented and is heavily based on discussions. If you do not attend, you will not be able to participate. The tolerated limit of necessary absences is two class meetings.

**Assignments:** You are expected to submit assignments on time. Late assignments may result in a lower grade. A research project will be handled on the 9<sup>th</sup> week of the course and should be returned during the final exams schedule.

**Academic Integrity:** Any act of cheating and plagiarism is not tolerated. Please refer to Student Code of Conduct under <http://www.aub.edu.lb/pnp/generaluniversitypolicies> and in particular section 1.1, which concerns academic misconduct including cheating, plagiarism, in-class disruption, and dishonesty.