

## **Bi123**

### **The Biology of Cancer**

#### **Instructor**

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#### **Course Background and Goals**

Cancer has been a recognized ailment for many centuries, but was not considered a serious threat to human health until the 1900s, when advances in medical science began to mitigate the more common forms of morbidity and mortality. Cancer is a collection of over one hundred diseases that show various clinical differences, but have similar underlying causes and effects: the normal genetic controls of cell division malfunction, allowing a cell to undergo unrestrained multiplication, usually leading to an anomalous mass of cells (a tumor), some of which may spread to distant locations in the body to establish further tumors. Cancer is thus rightly called a genetic disease. We will focus our attention on the genetics and cell biology of cancer since tremendous advances in our understanding of the initiation and progression of cancers, and in the promise of effective treatment, have been realized in the past two decades through basic research in genetics and cell biology.

This is an introductory course, meaning nothing more than that there are no prerequisites for enrollment. Though a background in biology is useful, it is neither essential nor necessary. This course will be taught under the assumption that students have no more than a high-school level familiarity with basic life sciences (specifically regarding cells and genes). Those who have no experience with or recollection of biology may find the pace of this course quite rapid; those well-versed in biology may find the pace rather slow at times. Most of the material, however, will be new to all students.

There is a considerable amount of unique terminology in all branches of the life sciences, and this is perhaps most evident in medicine. While we will endeavor to minimize the use of such terminology as can be reasonably done without creating confusion, we will still develop an extensive vocabulary to describe processes or components specific to cell biology, genetics, anatomy, physiology, and cancer. You should approach this course as if you are taking an introductory course in a foreign language, and routinely review the vocabulary in common use.

By the end of the term we hope that you will have developed a thorough understanding of the biological basis of cancer—its causes, conditions, treatments, and prognoses. This can benefit you in several ways: you should be much better able to evaluate scientific articles on cancer in popular press; you may become an effective advocate, interpreter, or liaison for a family member or friend facing cancer; you can make more educated choices if you should become a cancer patient yourself; and you may be motivated to adopt a lifestyle that significantly minimizes your lifetime risk of developing cancer.

## Format

There will be three 50-minute lectures each week. Attendance is not mandatory, but much of the information that you will be expected to assimilate (and demonstrate on exams) will not be found in the reading. Slides used in most lectures will be made available on the website as pdf files a day or two before each lecture. Detailed notes for most of the week's lectures will be posted on the website at the end of each week. See below for website details.

## Discussions

Discussion sections are on Thursdays. Attendance is mandatory, and since the course is full you cannot make up an absence by attending a different section. In these sessions we will expand upon material presented in lecture, explore topics not addressed in lecture, and provide opportunities to clarify lecture material. The schedule below gives you the topic and, where relevant, reading for each week; however, **it is imperative that you go the "Discussion" link on the course website** each week for more information about what will be done that week.

Week	Date	Topic	Reading (packet page numbers in parentheses)
1	Jan. 7	Course business	
2	Jan. 14	Cells	<i>Explore Life</i> (5-15)
3	Jan. 21	Mitosis, cell cycle	<i>Explore Life</i> (16-23)
4	Jan. 28	Review for exam	
5	Feb. 4	TBA	
6	Feb. 11	Cancer as a multi-step process	
7	Feb. 18	Oncogenes and tumor suppressor genes	The roots of cancer (87-91) Rebels without a cause (93-96) Dark angel (97-100)
8	Feb. 25	Review for exam	
9	Mar. 4	Discussion: Cancer screening	Should women in their 40s have mammograms? (147) Safe or sorry (149-152) Mammograms on trial (153-155) Mammography Task Force (Website>Resources>Supplemental reading) Does screening for prostate cancer make sense? (157) The dilemmas of prostate cancer (159-163) Prostate cancer screening (Website>Resources>Supplemental reading)
10	Mar. 11	Review for exam	

You are expected to have done the reading prior to attending your section. In some cases there will be brief writing assignments associated with this reading material. The assignments will be announced one week prior to the relevant discussion session. For exam reviews you will be expected to provide at the beginning of your session at least one written question on the course material to be covered on the exam. All discussion assignments will count toward your course grade.

## Course packet and references

A course packet that contains selected readings is required, and can be purchased at the UO Bookstore. If a packet is not available, you must request one at the Bookstore, and they should have it for you within 24 hours.

There are no adequate texts currently in print for a survey course on cancer biology at the introductory level, and thus there is no required text for this course. However, some books do address many of the topics that we will cover in a thorough way without overwhelming the reader with technical jargon. A particularly good general book that emphasizes the molecular biology of cancer is *One Renegade Cell*, by Robert Weinberg. A broader general text is the out-of-print *Cancer: The Misguided Cell*, by David Prescott and Abraham Flexer. For a more detailed treatment of several topics, *The Biological Basis of Cancer*, by Robert McKinnell, et al., is an excellent resource. Copies of these books will be on reserve in the Science Library.

## Grading

Each student's course grade will be determined from the highest score derived from 3 methods:

	Method 1	Method 2	Method 3
Exam 1	100 pts	150 pts (100 x 1.5)	-
Exam 2	100 pts	-	150 pts (100 x 1.5)
Final exam	150 pts	200 pts (150 x 1.333)	200 pts (150 x 1.333)
Discussion (10 sessions, 5 pts each)	50	50	50

**No other opportunities for points will be offered.** Early or makeup exams will not be offered. If you miss a midterm exam your grade will be based upon the Method 2 or Method 3 scores. Exams will be based upon lecture material, reading, and discussion section material.

## Course web site

The course web site address is <http://biology.uoregon.edu/classes/bi123w10/>. The site is linked to Blackboard on the Announcements page. It contains the lecture and lab schedules, staff contact information, lecture notes and PowerPoint slides, supplemental material, announcements, current student scores, and related links. Check it regularly, as this is the best mechanism by which we can notify you of schedule changes and updates. Lecture notes, slides, and supplemental reading are password protected.

## Class conduct

Class starts promptly at 3:00 and ends at 3:50. Please arrive on time and do not pack up before the conclusion of the lecture. Arriving late and leaving early is disruptive to others around you and to the speaker. Do not talk during lecture in a volume audible to anyone but the intended recipient, or allow cell phones or pagers to ring during lecture or discussion.

Please be familiar with the student conduct code, which can be viewed at

<http://studentlife.uoregon.edu/StudentConductandCommunityStandards/StudentConductCode/tabid/69/Default.aspx>

Sanctionable offenses include academic dishonesty (cheating, plagiarism, etc.) and disruptive behavior (interference with the process of instruction, unreasonable noise, behavior that results in unreasonable annoyance, etc.). Sanctions can include, but are not limited to, a failing grade in the course.