

BIMM134 – The Biology of Cancer SPRING 2016

Lectures:

Peterson Hall 103

Tuesdays/Thursdays, March 29 – June 2

8:00 – 9:20 AM

Discussion Sections:

Monday – 3-4 APM 2301

Wednesday – 5-6 TM102

Instructor: Eric Bennett, Ph.D.

email - e1bennett@ucsd.edu

Office Hours: Tuesday 3-4 and Thursday 4-5 pm,

Natural Sciences Building, Room 6105

“Required” Textbook:

The Biology of Cancer – 2nd Edition

Robert A. Weinberg

Copies of the textbook are on reserve at the Biomedical Library

Exams:

Midterm I: April 21, in-class

Midterm II: May 19, in-class

Final: June 11 – 8AM, comprehensive

Final grade breakdown

Midterm I – 30%

Midterm II – 30%

Final – 35%

In class participation – 5%

Exam policy:

There will be **NO** makeup exams.

You are required to take all exams without exception.

Midterm exam re-grade requests will be allowed. Requests will need to be made in writing no later than 1 week prior to date at which graded exams are returned to the class. Re-grade requests must be typed and printed and appended to the original exam. Email requests will not be allowed and all re-grading decisions are final.

Instructional Assistant: (Discussion sessions to be held in Weeks 2 to 10)

Name	Email Address	Sessions
Lindy Jiang	Yij019@ucsd.edu	Monday – 3-4 APM 2301 Wednesday – 5-6 TM102

Email policy:

Use the instructional assistant as your primary contact point for questions - I will attempt to answer short and direct clarification questions as long as you include BIMM134 in subject line of email. Long open-ended emails will likely receive either no response or a short response. I will respond to emails only once a day so if you don't receive an immediate response, wait.

Course Learning Goals:

I. Understand the heterogeneity and complexity associated with human cancers.

Key Concepts

What extrinsic and intrinsic factors lead to cancer initiation?

What cell types contribute to cancer initiation?

How does the surrounding tumor microenvironment as well the interactions between the tumor and other body systems impact cancer formation?

II. Understand the molecular features that drive cancer formation.

Key Concepts

How do cells lose the ability to control their growth?

What cellular signaling pathways are commonly perturbed during cancer formation?

What defects in cellular and molecular failsafe mechanisms expose vulnerabilities to cancer formation?

III. Understand the genetic basis for cancer formation

Key Concepts

How does cancer result from genetic clonal evolution?

What molecular pathways prevent genetic alteration?

How does genetic alteration lead to cancer formation and chemoresistance?

How is our current genetic understanding of cancer being used to treat specific cancers?

IV. Understand the experimental basis for historical and current discoveries in cancer biology.

Key Concepts

How were/are oncogenes and tumor suppressors discovered?

Who were scientists responsible for historically significant discoveries in cancer biology?

How are current cancer research efforts reshaping our view of cancer?

BIMM134
Biology of Cancer

Lecture subject	Reading
March 29 - Introduction to Cancer A. Key terminology B. Cancer Stats C. Carcinogens and environmental causes D. Cell Signaling	Chapter 2 – tBoC Pgs 31-44;59-69
March 31 – Genetic variability and heterogeneity in Cancer A. Multi-step tumorigenesis B. Genetic variability in Cancer C. Cancer Genomics D. Clonal evolution theory	pdf on course website Chapter 11 – tBoC Pgs 439-474
April 5 – Tumor Viruses A. Animal Tumor viruses and cellular transformation B. Human Tumor viruses	Chapter 3 - tBoC
April 7 – Human Cellular Oncogenes	Chapter 4 - tBoC
April 12 – Tumor Suppressors	Chapter 7 – tBoC
April 14 – Loss of proliferation control I RTKs – Ras	Chapter 5 – tBoC Chapter 6 - tBoC Pgs 175-193
April 19 - Loss of proliferation control II – Cell cycle	Chapter 8 – tBoC Pgs 231-254

April 21 – Midterm - I

April 26 – Loss of feedback inhibition – A. Translational control B. nutrient growth control; PI3K – mTOR	Chapter 6 – tBoC Pgs 193-202 pdf on course website
-----------------------------------------------------------------------------------------------------------------	----------------------------------------------------------

April 28 – Avoiding cell growth suppressive signals – Senescence

Chapter 10 – tBoC
pdf on course website

May 3 – Avoiding cell growth suppressive signals – p53

Chapter 9 - tBoC
Pgs 331-378
pdf on course website

May 5 - Avoiding cell growth suppressive signals – Apoptosis I

Chapter 9 - tBoC
pdf on course website

May 10 - Avoiding cell growth suppressive signals – Apoptosis II

Chapter 9 - tBoC
pdf on course website

May 12 - Genomic instability and DNA damage

Chapter 12 – tBoC

May 17 - Cellular heterogeneity in tumors and tumor initiating cells.
Geoff Wahl Guest Lecture

pdf on course website

May 19 – Midterm 2

May 24 - The Cancer Microenvironment and Angiogenesis

Chapter 13 – tBoC

May 26 – Metastasis

Chapter 14 – tBoC
Pgs 641-694

pdf on course website

May 31 – Cancer Metabolism
Reuben Shaw Guest Lecture

June 2 – Cancer Immunology

Chapter 15 - tBoC

June 11 – Final Exam 8AM