

Syllabus, Molecular Basis of Human Disease, BIMM 110, Spring 2011

Location: Center Hall 101

Time: 3:30 PM to 4:50 PM, Tuesdays and Thursdays

Instructor: Professor Dong-Er Zhang, email: d7zhang@ucsd.edu

Website for the course: WebCT with your own username and password

Course Description:

This course presents 1) genetic, biochemical, and molecular biological approaches used to identify the molecular basis of human diseases; 2) the current understanding of selected major human diseases at molecular and cellular levels with resulted physiological consequences; 3) successful and possible therapeutic treatment of these human diseases. This is an upper level undergraduate class. It is expected that students who take BIMM 110 already have a good background in molecular biology, metabolic biochemistry, and genetics.

There is no required course textbook. Lecture slides will be posted on the website and are available for download.

Reference textbooks:

1. An Introduction to Human Molecular Genetics (2nd Edition), J.J. Pasternak, 2005

2. Human Molecular Genetics (4th Edition), Tom Strachan & Andrew Read, 2010. One copy may be available in our biomedical library; 3rd edition textbooks should be available.

3. Molecular Biology of the Cell (5th Edition), B. Alberts et al., 2008

These three textbooks are also on reserve at BioMedical libraries.

[Wikipedia](http://en.wikipedia.org) is a searchable reference website with explanations for nearly all of the specialized terminology used in the course.

Week 1:

March 29, Lecture 1: Diseases, genes, cell cycles, and chromosomes

March 31, Lecture 2: Human disease pedigree and hemophilia

Week 2:

April 5, Lecture 3: Gene expression, mutation, and diseases of red blood cells

April 7, Lecture 4: Epigenetics in gene expression, human diseases, and X-inactivation

Week 3:

April 12, Lecture 5: Meiotic disjunction and chromosomal numerical abnormalities

April 14, Lecture 6: Identification of disease genes by analyzing human genome

Week 4:

April 19, Lecture 7: Cell lines and animal models to study human diseases

April 21, Lecture 8: Muscle disorders

Week 5:

April 26, Lecture 9: Cystic fibrosis

April 28, Lecture 10: Diabetes mellitus, an overview (guest lecture, Steven Chessler, MD-PhD)

Week 6:

May 3, Midterm exam

May 5, Lecture 11: Cancer and oncogenes

Week 7:

May 10, Lecture 12: Signal transduction in cancer and metabolism (guest lecture, Reuben Shaw, PhD)

May 12, Lecture 13: Cell cycle and apoptosis related to cancer/tumor suppressors

Week 8:

May 17, Lecture 14: Telomeres, genome stability and aging (guest lecture, Jan Karlseder, PhD)

May 19, Lecture 15: Human Mitochondrial Diseases

Week 9:

May 24, Lecture 16: Neurodegenerative diseases

May 26, Lecture 17: Dynamic mutations and human disease (guest lecture, Albert La Spada, MD-PhD)

Week 10:

May 31, Lecture 18: Genetics and stem cell based therapy for macular degeneration in the era of personalized medicine (guest lecture, Kang Zhang, MD-PhD)

June 2, Lecture 19: Stem cells and gene therapy

Class attendance: Students are expected to attend all lectures. Keep cell phone off or on vibrate mode.

Professor Office Hours (start from week 2): Professor Zhang will hold office hours on Mondays from 5:00 PM to 6:00 PM, starting from the second week of class, in Leichtag 3A05. Additional office hours may be requested by appointment and will be located in Rm 5328 of Moores UCSD Cancer Center.

Discussion sections and office hours of Teaching Assistants (start from week 2):

Students can attend any discussion sections. Attendance is not required. However, you will learn more **(get a better grade)** if you regularly attend sections and office hours.

TA Discussion section and office hour time and place:

Mon 1:00 - 2:00p, WLH 2209, XXXXXX, office hours: 2:00 - 3:00p on Mondays in WLH 2209 (May 30, Monday is a holiday, this 2-hour session will be on Friday in the last week of class, at Rm 2250 of Cancer Center Building)

Tue 9:00 - 9:50a, CENTR 201, XXXXXX, office hours: Thur 2:15 - 3:15p at Price Center East

Tue 12:00 - 12:50p, U413, XXXXXX, office hours: Wed 10:00 - 11:00a at the Mandeville Coffee Cart

Wed 1:00 - 1:50p, CENTR 218, XXXXXXXX, office hours: Thur 5:00 - 6:00p at Sungod Lounge

Wed 4:00 - 4:50p, SEQUO 148, XXXXXXXX, office hours: 5:00 - 6:00p on Wednesday in SEQUO 148

Thu 1:00 - 1:50p, HSS 1305, XXXXXXXX, office hours: Fri 1:00 - 2:00p at Sungod Lounge

Fri 9:00 - 9:50a, CENTR 220, XXXXXXXX, office hours: Tue 11:00a - 12:00p at Café Roma

Fri 12:00 - 12:50p, WLH 2115, XXXXXXXX, office hours: Thur 2:00 - 3:00p at Price Center Theater

Course grading

MIDTERM EXAM: May 3, 3:30 - 4:50 PM, location will be announced later. The midterm exam will account for 40% of the final grade. No make-up exams.

FINAL EXAM: June 6, 3:00 - 5:59 PM, location will be announced later. The final **comprehensive** exam will account for 60% of the final grade.

Both exams will be closed book/closed computer/no any electronics. There will be zero tolerance to any cheating behavior. The format of midterm and final exams will be similar, i.e. short answers to short questions. All questions on both exams will be derived from lecture material.

The midterm and final exam questions with answers from last year are at the WebCT site to assist you to prepare for the exams.

Overall course letter grades will be calculated: $\text{midterm} \times 40\% + \text{final} \times 60\% = \text{score}$

88-100 - A

76-87 - B

65-75 - C

53-64 - D

0-52 - F

Regrades: We will randomly copy students' exams. Only exams written in ink can be submitted for regrade. Any requests for regrades must be submitted in writing (clearly state the reason for regrade request and attach the statement to the complete exam) within 7 days after the exams have been returned. Professor Zhang reserves the right to regrade the entire exam when a request is submitted, which may change the score in either directions.