Syllabus, Molecular Basis of Human Disease, BIMM 110, Winter 2015

Location: Center Hall 101

Time: 5:00 PM to 6:20 PM, Monday and Wednesday

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

Website for the course: TED 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 TED website and are available for download.

Reference textbooks:

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

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

[Wikipedia](#) is a searchable reference website with explanations for nearly all of the specialized terminology used in the course.

Week 1:
January 5, Lecture 1: Diseases, genes, cell cycles, and chromosomes
January 7, Lecture 2: Human disease pedigree and hemophilia

Week 2:
January 12, Lecture 3: Gene expression, mutation, and diseases of red blood cells
January 14, Lecture 4: Epigenetics in gene expression, human diseases, and X-inactivation

Week 3:
January 19, Martin Luther King, Jr. Holiday
January 21, Lecture 5: Meiotic disjunction and chromosomal numerical abnormalities

Week 4:
January 26, Lecture 6: Identification of disease genes by analyzing human genome
January 28, Lecture 7: Cell lines and animal models to study human diseases

Week 5:
February 2, Lecture 8: Cystic fibrosis
February 4, Lecture 9: Genetic Characteristics of Ophthalmologic Diseases and Treatment
(guest lecture, Kang Zhang, MD-PhD)

Week 6:
February 9, Midterm exam
February 11, Lecture 10: Muscle disorders

Week 7:
February 16, President's Day Holiday
February 18, Lecture 11: Human mitochondrial diseases

Week 8:
February 23, Lecture 12: Cancer and oncogenes
February 25, Lecture 13: Cell cycle and apoptosis related to cancer/tumor suppressors (Clark
Chen, Brain tumor and treatment)

Week 9:
March 2, Lecture 14: Gametogenesis, embryo development, and infertility
March 4, Lecture 15: Neurodegenerative diseases

Week 10:
March 9, Lecture 16: Repeat expansions and human diseases (guest lecture, Albert La Spada,
MD-PhD)
March 11, Lecture 17: Stem cells and related therapy

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

Course grading

MIDTERM EXAM: February 9, 5:00 - 6:20 PM. The midterm exam will account for 35% of the
final grade. No make-up exams.

FINAL EXAM: March 16, 7:00 - 9:59 PM, location will be announced later. The final
comprehensive exam (all lectures) will account for 65% of the final grade. No Make-up exams.

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
materials.

Overall course letter grades will be calculated: midterm x 35% + final x 65% = score
90-100 – A; 78-89 – B; 65-77 – C; 53-64 – D; 0-52 - F