Syllabus, Molecular Basis of Human Disease, BIMM 110 (766002), winter 2013

Location: Center Hall 216

Time: 12:30 PM to 1:50 PM, Tuesdays and Thursdays

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

These two textbooks are also on reserve at BioMedical libraries.

<u>Wikipedia</u> is a searchable reference website with explanations for nearly all of the specialized terminology used in the course.

Week 1:

January 8, Lecture 1: Diseases, genes, cell cycles, and chromosomes January 10, Lecture 2: Human disease pedigree and hemophilia

Week 2:

January 15, Lecture 3: Gene expression, mutation, and diseases of red blood cells January 17, Lecture 4: Epigenetics in gene expression, human diseases, and X-inactivation

Week 3:

January 22, Lecture 5: Meiotic disjunction and chromosomal numerical abnormalities January 24, Lecture 6: Identification of disease genes by analyzing human genome

Week 4:

January 29, Lecture 7: Cell lines and animal models to study human diseases January 31, Lecture 8: Muscle disorders

Week 5:

February 5, Lecture 9: Cystic fibrosis February 7, Lecture 10: Gametogenesis, embryo development, and infertility

Week 6:

February 12, Midterm exam

February 14, Lecture 11: Genetic Characteristics of Ophthalmologic Diseases and Treatment (guest lecture, Kang Zhang, MD-PhD)

Week 7:

February 19, Lecture 12: Human mitochondrial diseases February 21, Lecture 13: Neurodegenerative diseases

Week 8:

February 26, Lecture 14: Repeat expansions and human diseases (guest lecture, Albert La Spada, MD-PhD)

February 28, Lecture 15: Cancer and oncogenes

Week 9:

March 5, Lecture 16: Cell cycle and apoptosis related to cancer/tumor suppressors March 7, Lecture 17: Gene therapy

Week 10:

March 12, Lecture 18: Signal transduction in cancer and metabolism (guest lecture, Reuben Shaw, PhD) March 14, Lecture 19: Stem cells and regenerative medicine

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

Professor Zhang Regular Office Hours (start from week 2): Professor Zhang will hold office hours on Mondays from 4:30 PM to 5:30 PM, week 2 to week 10 (EXCEPT HOLIDAYS), in Leichtag 205. Professor Zhang will have a midterm review session at 3pm on February 8 (Friday, location: TBD) but no office hour on February 11.

Professor Zhang <u>Three</u> Extra Office Hours: In Rm 2250 of Moores UCSD Cancer Building, 5-6pm, January 25, February 22, March 8

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