Syllabus, Molecular Basis of Human Disease, BIMM 110, winter 2014

Location: Peterson Hall 110

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

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.

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

Week 1:
January 6, Lecture 1: Diseases, genes, and chromosomes
January 8, Lecture 2: Cell cycles, human disease pedigree, and hemophilia

Week 2:
January 13, Lecture 3: Gene expression, mutation, and diseases of red blood cells
January 15, Lecture 4: Epigenetics in gene expression, human diseases, and X chromosome inactivation

Week 3:
January 20, Martin Luther King, Jr. Holiday
January 22, Lecture 5: Meiotic disjunction and chromosomal numerical abnormalities

Week 4:
January 27, Lecture 6: Identification of disease genes by analyzing human genome
January 29, Lecture 7: Cell lines and animal models to study human diseases

Week 5:
February 3, Lecture 8: Cystic fibrosis
February 5, Lecture 9: Genetic Characteristics of Ophthalmologic Diseases and Treatment (guest lecture, Kang Zhang, MD-PhD)

Week 6:
February 10, Midterm exam
February 12, Lecture 10: Cancer, oncogenes, and tumor suppressors

Week 7:
February 17, President's Day Holiday
February 19, Lecture 11: Brain tumors and treatment (guest lecture, Clark Chen, MD-PhD)

Week 8:
February 24, Lecture 12: Human mitochondrial diseases
February 26, Lecture 13: Muscle disorders

Week 9:
March 3, Lecture 14: Neurodegenerative diseases
March 5, Lecture 15: Repeat expansions and human diseases (guest lecture, Albert La Spada, MD-PhD)

Week 10:
March 10, Lecture 16: Gametogenesis, embryo development, and infertility
March 12, Lecture 17: Stem cells and regenerative medicine

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