CBPH 893 MODERN CONCEPTS IN CELL BIOLOGY Fall 2016 v2016 08 12

Tuesday and Thursday 3:00-5:00 PM, MBRB rm 6201, 4 credit hours

Course Director: Richard Cheney (Richard_Cheney@med.unc.edu) office:919-966-0331

Microscopy (Gupton)
Tue Aug 23 - Physics of Fluorescence Microscopy for Cell Biology; Demonstration (Jacobson)
Thu Aug 25 - Using Confocal Microscopy in Cell Biology (Costello)
Tue Aug 30 - How TIRF Microscopy Works and When to Use It (Gupton)
Thu Sept 1 - The Power and Limitations of Super Resolution Microscopy (Gupton)
Tue Sept 6 - Basics of Electron Microscopy (Costello)
Thu Sept 8 - Limitations and Future Innovations in Microscopy (Gupton)

Genetic and Functional Genomic Approaches in Cell Biology
(Brennwald, Hammond, Brenman)
Tue Sept 13 - Intro to Yeast Genetics and the Secretory Pathway (Brennwald)
Thu Sept 15 - Classical Genetics and Epistatic Analysis of Transport (Brennwald)
Tue Sept 20 - Molecular Genetics: Cloning the first Rab GTPase (Brennwald)
Thu Sept 22 - Suppressor Analysis to Identify New Components/Interactions (Brennwald)
Tue Sept 27 - Introduction to Fly Genetics (Brenman)
Thu Sept 29 – Modern Fly Genetics (Brenman)
Tue Oct 4 - RNAi (Hammond)
Thu Oct 6 - Genome Editing with CrispR/Cas9 (Hammond)
Tue Oct 11 - Mammalian Cell Genetics (Hammond)
Thu Oct 13 - High Throughput Genomics (Hammond)
Midterm exam – take home exam – due Mon Oct 17 at 11:00 AM
Tue Oct 18 - Bioinformatics (Hammond)

Proteomics (Major)
Thu Oct 20 - Fall Break – NO CLASS
Tue Oct 25 - Proteomics I (Major)
Thu Oct 27 - Proteomics II (Major)
Tue Nov 1 - Integrating Genomics and High Throughput Approaches (Major)

Protein Quality Control and Proteostasis (Cyr)
Thu Nov 3 - Quality Control (Cyr)
Tue Nov 8 - Chaperones (Cyr)
Thu Nov 10 - ER Quality Control (Cyr)
Tue Nov 15 - Quality Control and Human Disease (Cyr)

Discoveries & Controversies in Membrane Trafficking (Gupton and Brennwald)
Thu Nov 17 - An InterGolgi Assay and the Directionality of Transport (Gupton & Brennwald)
Tue Nov 22 – Coat Proteins and Vesicle Production (Gupton & Brennwald)
Thu Nov 24 - Thanksgiving Holiday- NO CLASS
Tue Nov 29 - Fusogenic Factors from Yeast to Man & the SNARE Hypothesis (Gupton & Brennwald)
Thu Dec 1 - Resolutions & Ongoing Controversies in Membrane Trafficking (Gupton and Brennwald)
Final exam - take home exam - due Mon Dec 5 at 11:00 AM

Time & Place
Class will meet Tuesdays and Thursdays from 3:00-5:00 PM in 6201 MBRB unless noted otherwise.

Format
Classes usually begin with a faculty member discussing the key ideas and points in a given area. The second half of each class is usually reserved for a student led discussion of papers on the topic from the primary literature, although there will occasionally be demonstrations or tutorials. Active participation of all students in presentations and discussions is a key part of the course.

Course Website
Course materials such as reading assignments and discussion papers will be posted to the course website on Sakai.

Student Assignments
For most of the classes groups of students will be assigned to present and lead discussion on research papers. Students listed first and marked with an asterisk are expected to present a few minutes of introduction and background information to "set the stage" for discussing the paper. The student(s) who are presenting a paper are expected to lead the discussion, but **EVERYONE IN CLASS IS EXPECTED TO HAVE READ EACH PAPER AND TO CONTRIBUTE TO THE DISCUSSION.**

Optional text
Although the reading materials for course such as review articles and research papers will be posted to the Sakai website, those who need to strengthen their background in a given area (or become more expert) will benefit greatly from reading the relevant chapters in Molecular Biology of the Cell, 6th Edition, Alberts/Johnson/Lewis/Morgan/Raff/Roberts/Walter. Alberts is an excellent text and provides a systematic coverage of modern cell biology.

Grading
Paper Presentations: ~ 25%
Class Participation: ~ 25%
Midterm exam ~ 25%
Final exam ~ 25%