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Office Hours: M 1-2pm or by appointment
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Text: Molecular Biology of the Cell (Alberts et al), 6th edition (a.k.a. MBC)

Course Objectives

BENG230B is an intermediate level graduate course designed to introduce students to the molecular components and physiological mechanisms that underlie the structure and function of cells. The course is designed to be an in-depth survey covering general concepts in cell biology and to emphasize these concepts within the context of current research questions and technical applications. Lectures will focus on: (i) basic biochemistry in cell biology (Chpts 2-3), (ii) cellular and molecular biology techniques (Chpts 8-9), (iii) structure-function relationships within (Chpts 4, 10, 12-16) and outside the cell (Chpt 19), and (iv) specialized cell types (Chpts 23). However, the format and content of the course overall will convey both the details of what is known in cell biology as well as how to apply it to fundamental and still unanswered questions.

Weekly Discussions

A portion of this course is dedicated to understanding and evaluating literature in cell biology, especially the engineering tools used to solve problems within biology. A recently published paper in cell biology will be suggested for students to read, and a corresponding weekly discussion will be held that will be lead by the TAs. This discussion is not intended to be additional lecture time and is *completely* optional. However, it should provide an opportunity to apply course concepts, design experiments, and propose engineering approaches to cell biology.

Biology and Biochemistry Basics Quiz

A “working knowledge” of the common language in biochemistry is essential for cell biology. To ensure that everyone has the vocabulary for cell and molecular biology, a closed book/notes quiz on relevant molbio and biochemistry terminology will be administered on the Wednesday of week two of the course (1/18/17). Content will come from chapters 2 and 3 from MBC.

Course Evaluation

10% Biochemistry Basics Quiz, 45% Midterm, and 45% Final. Midterm and final exams are “open book and notes.”

Homework

Homework will be posted on TED several times throughout the quarter and can be turned into TAs by the due date listed for comment on your answers. However, it will not be graded and should be used as practice for exams. Solutions will also be posted on TED after the homework due date. No late homework will be accepted for comment.

“Regrade,” Exam, and Academic Misconduct Policies

If there is a grade discrepancy, submit the original exam along with a written re-grade request to a TA within ONE WEEK of the date that the assignment was returned. Except for simple errors in adding points together for a final exam score, the entire assignment is subject to re-grading. Exams may not be missed without prior approval from the instructor. Academic dishonesty will not be tolerated. Any suspected incident will be dealt with in accordance with UCSD policy, which includes reporting the misconduct.

Date	Topic	Chapters
1/09/17	Introduction; Techniques (I)	8-9
1/11/17	Techniques (II)	8-9
1/13/17	<i>Discussion Section: Biochem Refresher</i>	
1/16/17*	Techniques (III)	8-9
1/18/17	Techniques (IV); Biochem Quiz	8-9
1/20/17	<i>Discussion Section: MACS Technique Paper</i>	
1/23/17	Structure-Function: Membranes (I)	10
1/25/17	Structure-Function: Membranes (II)	10
1/27/17	<i>Discussion Section: Lipid Raft Paper</i>	
1/30/17	Structure-Function: Organelles (I)	12, 14
2/01/17	Structure-Function: Organelles (II)	12
2/03/17	<i>Discussion Section: Mitochondria Paper</i>	
2/6/17	Structure-Function: Organelles (III)	13,15
2/8/17	Structure-Function: Organelles (IV)	13
2/10/17	<i>Discussion Section: Exam Review</i>	
2/13/17	MIDTERM EXAM	
2/15/17	Structure-Function: Nucleus	4, 12
2/17/17	<i>Discussion Section: Nuclear Export Paper</i>	
2/20/17*	Structure-Function: Cytoskeleton (I)	16
2/22/17	Structure-Function: Cytoskeleton (II)	16
2/24/17	<i>Discussion Section: Actin Paper</i>	
2/27/17	Structure-Function: Cytoskeleton (III)	16
3/01/17	Structure-Function: Cytoskeleton (IV)	16
3/03/17	<i>Discussion Section: Tensegrity Paper</i>	
3/06/17	Structure-Function: Cell-ECM (I)	19
3/08/17	Structure-Function: Cell-ECM (II)	19
3/10/17	<i>Discussion Section: Traction Force Paper</i>	
3/13/17	Specialized Cell Types: Stem Cells	22
3/15/17	Specialized Cell Types: Cancer	20
3/17/17	<i>Discussion Section: Exam Review</i>	
3/22/17**	FINAL EXAM	

Optional

Discussion Sections are in *ITALICS*

***Class optional due to MLK and President's Day Holiday**

****Final Exam: 3/22/17 from 8:00-11:00am in Fung Auditorium**