

MCB 2210-002
Honors Cell Biology
Tu/Th 12:30-1:45, LH 206

Instructors: Dr. Adam Zweifach, BPB 309, x6-1627
adam.zweifach@uconn.edu
Dr. Kenneth Campellone, BCH 246, x6-2497
kenneth.campellone@uconn.edu

Teaching Assistant: None

Office Hours: By arrangement

Textbook: We are not absolutely requiring a text, as we feel that you could possibly get the information you need from the variety of sources that were used to generate our lecture notes. However, this course will move quickly, and we expect you to come to class having familiarized yourselves with the material to be covered. It would be safest for you to obtain a copy of Lodish et al.'s *Molecular Cell Biology* 7th edition. You can buy or rent this from Amazon, or purchase access from the Publisher's web site: (<http://bcs.whfreeman.com/lodish7e>). Note that class participation may be factored into determination of your final grade.

Exams and Grading: Three elements will go into determining your final grade. In-class quizzes of 5-10 multiple choice or short answer questions will make up 30% of your grade. In addition, two section exams will be given, the first on Thursday, Oct. 15th and the second on Thursday, Dec. 10th, which together will comprise the remaining 70% of your grade. Both will be open-book open-note open-internet take-home exams. We do not plan on administering a final exam.

Website: A variety of materials will be made available on the course website at HuskyCT (<https://learn.uconn.edu/webapps/portal/frameset.jsp>). Students should make extensive use of this resource. The website will contain lecture outlines and research papers, as well as links to information on the internet. This means that you can print out the lecture notes and papers prior to class and bring them along. Lecture audio files will also be posted after each class.

Strategy for Success: The course emphasizes concepts. You should pay attention and attempt to understand these concepts while writing supplementary notes to reinforce the outline. You *must* participate in discussion during class. This is a good way to affirm your understanding of the material. If you do not volunteer to express your ideas, we will call on you. Exams will focus on the material covered in the lecture and discussion sections. Concentrate on understanding the concepts and pathways rather than memorizing details. Use the diagrams and video links in the notes to help you visualize these concepts.

Academic Misconduct: Academic misconduct in any form is in violation of the UConn Student Conduct Code and will not be tolerated. This includes, but is not limited to: copying or sharing answers on assignments, plagiarism, lying about a conflict with the time scheduled for an exam,

etc. Depending on the act, a student could receive an F grade on the test, F grade for the course, or could be suspended or expelled. We take cheating very seriously. DO NOT DO IT.

Syllabus Part 1: Zweifach

In the first half of the course, we will use the extracellular growth factor receptor (EGFR), a protein that when overexpressed or mutated is involved in a huge number of cancers, as a springboard for examining the functional roles, regulation, synthesis and trafficking of membranes and proteins in eukaryotic cells. Topics covered will include:

- Introduction: What are cells? What is their basic structure? What is the EGFR and why is it an appropriate subject on which to organize these lectures?
- Membranes and membrane proteins
- Signal Transduction
- Synthesis and trafficking of proteins to organelles, including:
 - The ER/Golgi/lysosomes and plasma membrane, nucleus, mitochondria, chloroplasts, and peroxisomes
- Vesicle trafficking, endocytosis, exocytosis and phagocytosis
- Membrane transporters

A number of original research articles relating to the EGFR will be used to explore and illuminate these topics.

Syllabus Part 2: Campellone

In the second half of the course, we will examine the dynamic behaviors of proteins, organelles, and cells, and we will discuss how these functions relate to human health and disease. Traditional lectures are not a component of the second half of the course, and you will be expected to independently learn the material that is provided in our notes and supplemented by the textbook. Topics covered will include:

- Structure and Function of Actin, Microtubules, and the Cytoskeleton
- Molecular Motor Proteins
- Membrane and Organelle Dynamics
- Mitosis and Cytokinesis
- Cell Growth, Cell Cycle, Cell Death
- Cell Connections and the Extracellular Matrix
- Cell Movement and Migration
- Stem Cells, Pathogen-infected Cells, Cancer Cells

Several primary research papers will be used to highlight the relationships between these basic biological processes, disease pathogenesis, and medicine.