BIOLH200.SP18 – Cell Structure and Function

Cell Structure and Function

**Lectures:** Chase Auditorium, T/Th 10:00am – 11:30am & M/W 11:15am-12:45pm. Lecture attendance is critical to mastering the material in this course; please do not enter the lecture hall late or leave before the end of the lecture unless you have an excused absence.

**Text:** Essential Cell Biology, 4th edition, is a required text for the course. Copies are available in the Campus Bookstore and are on reserve in the Science Library (3rd floor KINSC). I will also be using experts from other text and will provide a PDF copy on Moodle for you.

**Kristen Whalen’s Office Hours:** Kristen will be available immediately after each lecture and can address questions about the course and lecture material. Should you have additional questions, please email Kristen for individual appointments (Office S314). Questions regarding grades will only be addressed in person and not over email. (kwhalen1@haverford.edu)

**Quarter 4 - Summary (Kristen Whalen’s Lectures)**

Cell Structure, Cellular Communities, and Physiology

**Reading:** Students are responsible for preparing for each lecture by completing the readings posted on the Moodle site (relevant chapter(s) from ECB, and any supplemental materials). Please note that these readings do not serve as a substitute for the material presented in lecture. Lectures will be taped with Panopto to capture lecture content as a study aid; however, students remain responsible for coming to lectures and, in the event of any technical issues, a corresponding Panopto recording may not be available. You will be responsible only for material covered in lecture. You are not responsible for material in the reading that was not covered in class.

Please check the online version of the syllabus frequently for updates to the reading, etc. I will post any additional readings, websites, etc. that I think may be useful to you on the Moodle site.

**Grading:** Determination of your final semester grade is a combination of both lecture (80% of total) and laboratory (20% of total) material. In the lecture portion of the class, your grade will be determined by three non-comprehensive exams split over the course of the semester and study guides. The second exam will cover both material from Quarter 3 (Dr. Fairman) and Quarter 4 (Dr. Whalen).

- **Exam #2 – Take home exam.** To be picked up on Friday, March 30 at 9am and to be returned no later than Monday, April 2 at 4pm in the box outside the KINSC office.

- **Exam #3 – In-class final.** To be taken in class on either May 2nd or May 3rd depending on assigned section.

Students requiring special accommodations are encouraged to come speak with Kristen Whalen within the first week of class to discuss how she may help them navigate the fourth quarter. Kristen will ask Rob for a copy of the accommodations, however, if you would like to discuss anything additional with Kristen, please do so by the end of the first week of fourth quarter lecture (Friday, March 23) so that appropriate arrangements can be made to ensure your success. Kristen would be happy to discuss any concerns or needs with individual students at any point during her part of the lectures.
The calendar below offers an approximate guide to when particular topics will be covered and the associated reading. However, please check Moodle often for updates and amendments.

I. An Overview of the Cell  
*Date: March 19/20*  
Reading: ECB Chapter 1  

Topics: Unity and Diversity of Cells; Cells under the microscope; The Prokaryotic cell, The Eukaryotic Cell, Model Organisms

II. Membrane Structure  
*Date: March 21/22*  
Reading: ECB Chapter 11 (pg 359 – 369)  

Topics: The Lipid Bilayer, Membrane Fluidity, Membrane Assembly, Phospholipids

III. Transport Across Cell Membranes  
*Date: March 26/27*  
Reading: ECB Chapter 12 (pg. 383 – 396)  

Topics: Principles of Transmembrane Transport, Transporters and their functions

IV. Cytoskeleton  
*Date: March 28/29*  
Reading: ECB Chapter 17 (pg. 565 – 582)  

Topics: Intermediate Filaments, Microtubules

**EXAM 2: Take home exam (non-comprehensive). Covering the remaining lectures from Q3 not covered in Exam #1 and first 4 lectures of Q4.**  
- To be picked up on Friday, March 30 at 9am in the KINSC Office from Beth.  
- To be returned no later than Monday, April 2 at 4pm in the drop box outside the KINSC office.

V. Cytoskeleton Cont.  
*Date: April 2/3*  
Reading: ECB Chapter 17 (pg. 583 – 591)  

Topics: Actin Filaments, Cell crawling, Actin association with Myosin

VI. Cell Communities  
This exam will cover the readings and lecture material from Topics I-V.  
*Date: April 4/5*  
Reading: ECB Chapter 20 (pg. 683 – 701)  

Topics: Extracellular matrix and connective tissues; Epithelial sheets and cell junctions

VII. Cell Communities Cont.  
*Date: April 9/10*  
Reading: ECB Chapter 20 (pg. 702 - 724)  

Topics: Tissue maintenance and renewal; Cancer
VIII. Photosynthesis  
*Date: April 11/12*  
*Reading: ECB Chapter 16 (pg. 469 – 482)*

Topics: Chloroplasts, chlorophyll, light reactions, dark reactions, carbon fixation, chemosynthesis

IX. Introduction to Comparative, Environmental, and Evolutionary Physiology  
*Date: April 16/17*  
*Reading: TBD*

Topics: The meaning of “environment”, The meaning of “adaptation”, Physiological response on different scales

X. Fundamental Mechanisms of Adaptation  
*Date: April 18/19*  
*Reading: TBD*

Topics: Adaptation at the molecular and genome level, controlling protein action, protein evolution, physiological regulation of gene expression

XI. Thermal Physiology  
*Date: April 23/24*  
*Reading: TBD*

Topics: Introduction to heat exchange, Controlling heat flux, thermal strategies, life at high and low body temperatures

XII. Ionic and Water Balance  
*Date: April 25/26*  
*Reading: TBD*

Topics: Ionic and Osmotic Regulation, Regulators versus conformers, The Kidney: structure and function

XIII. Sensory Systems  
*Date: April 30/ May 1*  
*Reading: TBD*

Topics: Sensory reception, chemoreception, mechanoreception, photoreception

End-of-Quarter Exam  
*Date: May 2 and May 3*  
This non-comprehensive, in-class exam will cover the readings and lecture material from Topics since the second exam. You will have the entire class time to take the exam.