**CBIO 894 ADVANCED CELL BIOLOGY II**

**Spring Semester 2013**

**T/TH 3:00-5:00 PM 6201 MBRB**

**Principles of Signaling (Weiss, Brenman, Major)**

Thursday, January 10, 2013 (Brenman) – Introduction to Protein Kinases and Phosphatases

Tuesday, January 15, 2013- (Brenman) – Protein Kinases and Phosphatases

Thursday, January 17, 2013- (Weiss) - Basics of G-protein coupled receptor signaling

Tuesday, January 22, 2013- (Weiss) - G-protein coupled receptor signaling – Effector regulation

Thursday, January 24, 2013- (Major)

Tuesday, January 29, 2013- (Major)

Thursday, January 31, 2013 (Major) – Wnt Signaling

*(No class Feb 5th)*

# Cytoskeleton & Motility (Burridge, Jacobson, Bear)

 Thursday, February 7, 2013 (Bear) – Actin polymerization: Arp 2/3 complex

 Tuesday, February 12, 2013 (Burridge) – Rho family GTPases and focal adhesion assembly

 Thursday, February 14, 2013 (Bear) – Actin polymerization: Ena/VASP proteins

 Tuesday, February 19, 2013 (Bear) – Microtubule dynamics

 Thursday, February 21, 2013 (Burridge) - Rac and bacterial exploitation of Rho proteins

 Tuesday, February 26, 2013 (Burridge) - Focal adhesion disassembly

 Thursday, February 28, 2013 (Burridge/Jacobson) – Rigid substrates and tension-mediated regulation of RhoA activity

 Tuesday, March 5, 2013 (Jacobson)- Cell migration in 3 dimensions

**Midterm exam – take home exam** – assigned Tuesday March 5th 2013

Exams due at noon on Monday, March 11, 2013.

(*No class March 12th*)

**Cellular Differentation: Stem Cells to Gametes (O’Brien)**

Thursday, March 14, 2013 (O’Brien) – Stem cells: intrinsic regulation of pluripotency

Tuesday, March 19, 2013 (O’Brien) – Stem cells: post-transcriptional regulation by microRNAs

Thursday, March 21, 2013 (O’Brien) – The stem cell niche

Tuesday, March 26, 2013 (O’Brien) – Signaling differentiation

Thursday, March 28, 2013 (O’Brien) - Differential gene expression

*(No class April 2, 4)*

# Cell Cycle & Death (Deshmukh)

Tuesday, April 9, 2013 (Deshmukh) – Historical overview: Cyclins and CDKs

Thursday, April 11, 2013 (Deshmukh) – Cell cycle regulation by CDK inhibitors: p21, p27

Tuesday, April 16, 2013 (Deshmukh) – Cell cycle regulation by INK4a and p19ARF

Thursday, April 18, 2013 (Deshmukh) – Historical perspective: Cell death genes identified

Tuesday, April 23, 2013 (Deshmukh) – Bcl-2 family proteins and mitochondria

Thursday, April 25, 2013 (Deshmukh) – Caspase activation and IAPs

**Final exam – take home exam** – assigned Thursday April 25, 2013

Due at noon on Wednesday May 1, 2013.

# Time & Place

 Class will meet Tuesdays and Thursdays from 3:00 to 5:00 PM in 6201 MBRB (except when noted).

# Format

 Part of the class will be a lecture by one of the block leaders. The remainder of the lecture will be discussion of the primary literature. Active participation of the students, both in presentations, but also in general discussion, is required.

**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 work in the paper***. Everyone in class is expected to have read the review articles and papers and is expected to contribute to the discussion.*** Those students assigned to each paper are expected to lead the discussion of the paper.

**While reading the papers, consider the following questions for each figure:**

1) What experiment are they doing?

2) Why did they do this experiment?

3) What did they find?

4) Do you agree with their interpretation?

5) What is the next step?

**Grading**

Paper Presentations: ~ 25%

Class Participation: ~ 25%

Mid term exam ~ 25%

Final exam ~ 25%