

MOLECULAR BIOLOGY AND BIOCHEMISTRY

MBB 437-3

Selected Topics in Signal Transduction

Spring 2013

Instructor: Dr. N. Harden Office: SSB 7146

Description/topics: **General Course Description: (from calendar)**
Signal transduction, the conversion of an extracellular signal into cellular response, is presently one of the most intensively studied aspects of biology. Signaling pathways control a wide range of cellular processes and the characterization of these pathways is having a major impact on cell biology, developmental biology, biotechnology and medicine. In this course, we shall be examining the current literature in this rapidly developing field. We will look at how a combination of biochemistry, cell biology and genetics is being used to investigate the diverse mechanisms used in cell signaling, and examine how the various approaches to studying signal transduction complement each other. Classes will be in the form of lectures and student presentations.
3 lecture hours/week; 1 tutorial hour/week; 0 lab hours

Lecture topics:

1. Introduction: mechanisms of signal transduction, approaches available for studying signal transduction
2. Signal transduction by the small GTPase Ras
3. The trimeric G proteins and associated signaling pathways
4. Regulation of cellular events by the Rho subfamily of Ras-related small GTPases
5. Control of signal transduction by protein phosphatases
6. Pathways leading to programmed cell death (apoptosis)
7. Signaling by a protease cascade
8. Nitric oxide signaling
9. Other topics as time permits

Grading Grading will be based on a midterm exam (worth 20%), two assignments (worth a total of 65%) and class participation (worth 15%).

Recommended text: Lodish et al., Molecular Cell Biology, 6th Ed., 2008. W.H. Freeman and Co. 5th ed. also acceptable.

Prerequisite/corequisite: Prerequisites: MBB 321, MBB 322 and MBB 331 (or BISC 331)

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