

MCB 555 - Advanced Molecular and Cellular Biology
 Fall, 2006
 MWF 11:40-12:30, LSE B04

Instructors:

Douglas E. Chandler
 LSC 586
 965-5662
 d.chandler@asu.edu
 Office Hours:
 TW 10:00-11:00

Robert Roberson
 LSE 519
 965-8618
 robert.roberson@asu.edu
 Office Hours:

Jeffrey Touchman
 LSA B1-52
 602-343-8803
 j.touchman@asu.edu
 Office Hours:
 MW 1:00-2:00

Textbook: None. Readings will be from the research literature

	LECTURE TOPIC	INSTRUCTOR
Aug	21 Introduction; membrane structure and function	Chandler
	23 Membrane Lipids: Phase Transitions: Scanning microcalorimetry	
	25 Membrane Proteins: SDS gel electrophoresis	
	28 Lipid/Protein Rafts	
	30 Membrane Potential and Electrophysiology	
Sept	01 Lipid/Protein Raft - papers: Detection of lipid and protein movement	
	04 Labor Day - Class Excused	
	06 Membrane Potential and Electrophysiology	
	08 Electrophysiology - papers: Voltage and patch clamp measurements	
	11 Vesicle Transport: Intra-Golgi	<u>Graded Homework I</u>
	13 Vesicle Transport: ER to Golgi: Western Blotting	
	15 Vesicle Transport - papers: Biochemical assays for transport	
	18 Molecular Machinery for Docking and Fusion	<u>Homework Due</u>
	20 Exocytosis and Membrane Fusion	
	22 Exocytosis papers: Patch clamp, amperometric and microscopic observations	
	25 Signal Transduction: Receptors	
	27 Signal Transduction: G proteins	
	29 Receptors - papers: radioligand binding and G protein pharmacology	
Oct	02 Protein Phosphorylation: Kinase assays, in vivo and in vitro	
	04 Protein Kinases	
	06 Protein Kinases - papers	

Oct	09	Phosphatidylinositol Pathway		
	11	Calcium Signals		
	13	Calcium Signals - papers: calcium probes in live cells	<u>Homework II</u>	
	16	Tyrosine kinase/Growth Factor Receptors		
	18	Signaling Pathways to the Nucleus: Cell Cycle Control		
	20	Cell Cycle Control - papers: FACS	<u>Homework Due</u>	
	23	Microfilament networks: Light and Electron microscopy		Roberson
	25	Control of Microfilament Dynamics: Immunocytochemistry		
	26	Microfilaments - papers		
	30	Microtubule structure: Light and Electron microscopy		
Nov	01	Control of Microtubule Dynamics: Live-cell imaging		
	03	Motor protein biochemistry		
	06	Vesicle Transport and the Cytoskeleton: Live-cell imaging	<u>Homework III</u>	
	08	Microtubules and Motor Proteins - papers		
	10	Veteran's Day - Class Excused		
	13	Genome Sequence Acquisition and Analysis	<u>Homework Due</u>	Touchman
	15	The Human Genome		
	17	Genomics - papers		
	20	Genomic Variation		
	22	Gene Expression		
	24	Thanksgiving- Class Excused		
	27	Gene Expression - papers		
	29	Proteomics	<u>Homework IV</u>	
Dec	01	Proteomics - papers		
	04	Wrap up	<u>Homework Due</u>	

The course will be taught largely from the research literature and will typically involve in class discussion of 2 or 3 papers each week. Participation and leadership in class discussion will be evaluated and this evaluation will determine 20% of your semester grade. A large part of your grade (80%) will be determined by four graded homework assignments that are scheduled on the syllabus above. They will count equally toward your semester grade (20% for each assignment). Each homework assignment will given over a 5 day period only and will be graded by the instructor in charge - Chandler for I and II, Roberson for III and Touchman for IV.