

Instructors:

Doug Andres (Course Director), MS627B Medical Science Building, Ph. 257-6775;
dandres@uky.edu; Office hours: 10:50a-11:50a Wednesday

Michael Piascik, 148 HSRB, 323-5107, mtp@uky.edu

Subbu Apparsundaram, 306 Whitney Hendrickson Building, 323-1826, subbu@uky.edu

Olivier Thibault, MS320 Medical Science Building, 323-1981, othibau@uky.edu

Eric Blalock, MS310 Medical Science, 323-6124, emblal@uky.edu

Mariana Nikolova-Karakashian, MS571 Medical Science, 323-8210, mnikolo@uky.edu

Anthony Sinai, MN352 Medical Sciences Building, 323-6680, sinai@uky.edu

Carol Pickett, MN374 Medical Science Building, 323-5313, cpickett@uky.edu

Steve Post, 433 Sanders-Brown Center, 257-9166, spost@uky.edu

Rick McCann, MS671 Medical Science Building, 323-1796, rmcca1@uky.edu

Robert Geraghty, MS439 Medical Science Building, 257-5147, rgeragh@uky.edu

Room, Date, and Time: HSLC 115, MWF, 9-9:50 am.

Description: This is a 3 credit course that focuses on inter- and intracellular communication, from the generation of signaling molecules through the cellular responses. It teaches concepts central to understanding cellular signaling mechanisms. It covers the major signaling pathways and several emerging pathways. Explanations of cellular and molecular techniques that are important to understanding key advances in this area are integrated into the material presented. Class sessions will include didactic lectures and group discussions of problem sets or reading assignments.

Objectives: To convey an understanding of key concepts about cellular signaling mechanisms, about the major signaling pathways identified to date, and about the methods used to study these pathways.

Textbook: None required. A recommended reference text is: *Molecular Biology of the Cell*, Third Edition, by Alberts, Bray, Lewis, Raff, Roberts, and Watson. Garland Publishing.

Supplementary Materials: A limited number of reviews and primary articles will be assigned. Most will be available via the electronic journals page of the Medical Center Library website (<http://www.mc.uky.edu/medlibrary/resources/ejournals.htm>). Please note that you will need to access this site from a computer with a UK IP address.

Course Website via Blackboard. You will have password-level access to selected course material via the Blackboard server. Assignments will be posted there and we will also make use of some of the communication features. Some instructors will post their handouts to this site as well.

Examinations and Grading: There will be four closed book examinations. Legitimate medical or personal reasons for rescheduling an examination must be approved in advance by the course director. Each exam will be worth 20% of the final grade. The remaining 20% of the grade will be drawn from problem set assignments. There will be no comprehensive final examination. The fourth examination will be given at the time announced in the Schedule of Classes. Examinations are graded by a floored curve as below. The higher of the two grades will be the grade assigned.

A = 90% of total points or one standard deviation above the mean class grade.

B = 80% of total points or between one standard deviation above and one standard deviation below the mean class grade.

C = 70% of total points or between one standard deviation and two standard deviations below the mean class grade.

E = 60% of total points or less than two standard deviations below the mean class grade.

For graduate students, there is no "D" grade.

Discussion Session Problem Sets: Answers **must be machine printed** and submitted by the beginning of class. Late submission of answers will result in at least a 20% penalty. These take home questions will be slightly more difficult than the typical exam question. You may discuss them with anyone, including your classmates. However, you must write your answers in your own words. You may not share your written answers with classmates. Understand that copying or close paraphrasing of an answer from a classmate or any another source (without citation) is plagiarism.

Regrading Examinations: Students who believe that a mistake was made in the grading of an hour examination should re-submit the examination and a *signed* note that describes briefly which problem they want to have re-graded to Dr. Andres. Requests for re-grading of a particular hour examination must be submitted before the next hour examination. The examinations will be re-evaluated and returned with the subsequent hour examination.

Cheating: No form of cheating will be tolerated. Students are encouraged to read the Student Rights and Responsibilities with regard to cheating and plagiarism (<http://www.uky.edu/StudentAffairs/Code/part2-6.html>). The minimum punishment for cheating on an exam or plagiarism on an assignment is an E for the course.

*JAN. 14	Introduction to signaling HS115	Andres		
JAN. 16	Receptors and ligands	Post		
JAN. 19	MARTIN LUTHER KING			
JAN. 21	Hormones	Post	Add	
JAN. 23	Neurotransmitters	Post		
JAN. 26	Discussion I	Post		
JAN. 28	Transporters	Apparsundaram		
JAN. 30	Clearance of signaling molecules	Apparsundaram		
FEB. 2	Notch/Delta	Andres		
FEB. 4	Discussion II	Appars./Andres	Drop	
FEB. 5	EXAM I (thru 2/4) MN363	7-9 p.m.		
FEB. 6	G-protein coupled receptors	Piascik		
FEB. 9	GPCRs: heterotrimeric G-proteins	Piascik		
FEB. 11	GPCRs: effectors I	Piascik		
FEB. 13	GPCRs: effectors II	Piascik		
FEB. 16	Gasous messengers: NO and CO	Piascik		
FEB. 18	Discussion III	Piascik		
FEB. 20	Tyrosine kinases: RTKs	Andres		
FEB. 23	Tyrosine kinases: cytokine receptors	Andres		
FEB. 25	Src Kinases	Andres		
FEB. 27	Ras/MAPK Pathways I	Andres		
MAR. 1	Discussion IV	Andres		
MAR. 1	EXAM II (thru 2/25) MN363	7-9 p.m.		
MAR. 3	Ras/MAPK II	Andres		
MAR. 5	Mitogenic Signaling	Andres		
MAR. 8	Focal Adhesion Signaling	McCann		
MAR. 10	Rac/Rho and Cytoskeleton	McCann	MID	
MAR. 12	Discussion V	McCann/Andres		
MAR. 15	Ion Channels: Gap junction	Thibault	Wdate	
MAR. 17	SPRING BREAK			
MAR. 19	SPRING BREAK			
MAR. 22	SPRING BREAK			
MAR. 24	Ion Channels: Voltage-gated	Blalock		
MAR. 26	Ion Channels: External Ligand-gated	Blalock		
MAR. 29	Ion Channels: Other Ligand-gated	Thibault		
MAR. 31	Discussion VI	Thibault/Blalock		
APR. 1	EXAM III (thru 3/31) MN363	7-9 p.m.		
APR. 2	Calcium homeostasis	Thibault		
APR. 5	Calcium signaling	Thibault		
APR. 7	Seine/Threonine phosphate/kinases	Thibault		
APR. 9	Techniques in Calcium	Thibault		
APR. 12	Discussion VII	Thibault		
APR. 14	TGF beta signaling	MNK		
APR. 16	Lipid signaling I	MNK		
APR. 19	Lipid signaling II	MNK		
APR. 21	Discussion VIII	MNK		
APR. 23	Bacterial Patho./Signaling	Pickett		
APR. 26	Viral Patho./Signaling	Geraghty		
APR. 28	Parasitic Patho./Signaling	Sinai		
APR. 30	Signaling and toxins	Pickett		
MAY 5	FINAL EXAM HS115	8 AM		