

FALL COURSES

2011

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Building Abbreviations

Medical School

AMISB	Amistad Building	10 Amistad St.
BCMM	Boyer Center for Molecular Medicine	295 Congress Ave.
BML	Brady Memorial Laboratory	310 Cedar St.
CB	Clinic Building	789 Howard Ave.
CMHC	CT Mental Health Center	34 Park St.
CP	Congress Place	301 Cedar St.
ESH	Edward S. Harkness Memorial Hall	367 Cedar St.
FMB	Farnam Memorial Building	310 Cedar St.
HRT	Hunter Radiation Therapy	15 York St.
JEH	Jane Ellen Hope Building	315 Cedar St.
JPL	John Pierce Laboratory	290 Congress Ave.
LEPH	Laboratory of Epidemiology and Public Health	60 College St.
LH	Lauder Hall	310 Cedar St.
LLCI	Lippard Laboratory of Clinical Investigation	15 York St.
LMP	Laboratory for Medicine and Pediatrics	15 York St.
LSOG	Laboratory for Surgery, Obstetrics, and Gynecology	375 Congress Ave.
NSB	Nathan Smith Building	333 Cedar St.
SHM	Sterling Hall of Medicine	333 Cedar St.
TAC	The Anlyan Center for Medical Research and Education	300 Cedar St.
WWW	William Wirt Winchester Building	25 York St.
YCHRC	Yale Child Health Research Center	464 Congress Ave.
YPI	Yale Psychiatric Institute	184 Liberty Street

Science Hill/Main Campus

AKW	Arthur K. Watson Hall	51 Prospect St.
Bass	Bass Center for Molecular and Structural Biology	266 Whitney Ave.
BCT	Becton Engineering and Applied Science Center	15 Prospect St.
CRB	Chemistry Research Building	Prospect St.
DL	Dunham Laboratory	10 Hillhouse Ave.
ESC	Environmental Science Center	21 Sachem St.
GML	Greeley Memorial Laboratory	370 Prospect St.
JWG	Gibbs Laboratories	260 Whitney Ave.
KBT	Kline Biology Tower	219 Prospect St.
KCL	Kline Chemistry Laboratory	225 Prospect St.
MEC	Malone Engineering Center	55 Prospect St.
ML	Mason Laboratory	9 Hillhouse Ave.
OML	Osborn Memorial Laboratories	165 Prospect St.
SCL	Sterling Chemistry Laboratory	225 Prospect St.
SPL	Sloane Physics Laboratory	217 Prospect St.
SSS	Sheffield-Sterling-Strathcona Hall	1 Prospect St.

SPECIAL COURSES

BBS 877, Theory and Practice of Scientific Teaching I, zero credit. Jo Handelsman, Carl Hashimoto, Jennifer Frederick.

Students who take this course will develop competence and confidence as teachers. The course covers fundamentals of learning theory and practical strategies for teaching biology. Students practice lecturing, manage classroom dynamics, and implement strategies for effective and inclusive teaching. Pre-requisites: Students must have completed one semester of required teaching at Yale and have the permission of his/her graduate advisor. Also, participants are selected based on an application process. To request an application, please contact Jennifer.Frederick@yale.edu.

Tuesdays, 9:00 – 11:00 a.m., KBT 1202.

BBS 878, Theory and Practice of Scientific Teaching II, zero credit. Jo Handelsman, Carl Hashimoto, Jennifer Frederick.

Students will apply principles introduced in BBS 877 as they develop and evaluate instructional material for a college level biology course. Pre-requisites: BBS 877, permission of one's graduate advisor.

Tuesdays, 9:00 – 11:00 a.m., KBT 1202.

ENAS 825a, Physics of Magnetic Resonance Spectroscopy in Vivo. Graeme Mason, Robin de Graaf

At the end of the course, attendees should understand basic NMR theory, grasp enough of pulse sequence requirements and pitfalls to provide some critique of presentations, grants, and manuscripts, be able to discuss MR aspects of their projects before an audience of peers or grant reviewers, be able to perform some experimental design, including proposals of MR techniques to select, and grasp enough metabolic modeling and fMRI theory to design and critique studies of their own and of others.

Mondays and Wednesdays, 11:35 a.m. – 1:00 p.m., MRRC Conference Room, N-135 TAC-MRRC for most days, N-205 TAC for two days.

CELL BIOLOGY

CBIO 602a, Molecular Cell Biology. Sandra Wolin, Thomas Melia, Thomas Pollard, Craig Crews, and Faculty.
A comprehensive introduction to the molecular and mechanistic aspects of cell biology for graduate students in all programs. Emphasizes fundamental issues of cellular organization, regulation, biogenesis, and function at the molecular level.

Monday and Wednesday, 1:45 - 3:00 p.m., TAC N107. Also MB&B 602a and MCDB 602a.

CBIO 603a, Seminar in Molecular Cell Biology. Sandra Wolin, Thomas Melia, Thomas Pollard, and Faculty.
A graduate-level seminar course in modern cell biology. The class is devoted to the reading and critical evaluation of classical and current papers. The topics are coordinated with the CBIO 602a lecture schedule. Thus, concurrent or previous enrollment in CBIO 602a is required.

Thursday, 9:00 – 11:00 a.m., SHM C-225A. Also MCDB 603a.

CBIO 900a, First-Year Introduction to Research. Frank Slack, Carl Hashimoto, Charles Radding, and Faculty.
Lab rotations, grant writing, and ethics for Molecular Cell Biology, Genetics and Development Track students.

Monday, 4:00 – 5:30 p.m., KBT 1214. Also GENE 900a, MCDB 900a.

CELLULAR & MOLECULAR PHYSIOLOGY

C&MP 550a, Physiological Systems. Mark Saltzman, Emile Boulpaep.

The course develops a foundation in human physiology by examining the homeostasis of vital parameters within the body, and the biophysical properties of cells, tissues, and organs. Basic concepts in cell and membrane physiology are synthesized through exploring the function of skeletal, smooth, and cardiac muscle. The physical basis of blood flow, mechanisms of vascular exchange, cardiac performance, and regulation of overall circulatory function are discussed. Respiratory physiology explores the mechanics of ventilation, gas diffusion, and acid-base balance. Renal physiology examines the formation and composition of urine and the regulation of electrolyte, fluid, and acid-base balance. Organs of the digestive system are discussed from the perspective of substrate metabolism and energy balance. Hormonal regulation is applied to metabolic control and to calcium, water, and electrolyte balance. The biology of nerve cells is addressed with emphasis on synaptic transmission and simple neuronal circuits within the central nervous system. The special senses are considered in the framework of sensory transduction. Weekly discussion sections provide a forum for in-depth exploration of topics. Graduate students evaluate research findings through literature review and weekly meetings with the instructor. **Monday, Wednesday, and Friday, 9:25 – 10:15 a.m., Mason Lab.** Also ENAS 350a/550a, MCDB 310a/550a.

COMPUTATIONAL BIOLOGY & BIOINFORMATICS

CBB 740a, Clinical and Translational Informatics. Richard Shiffman, Michael Krauthammer.

The course provides an introduction to clinical and translational informatics. Topics include (1) overview of biomedical informatics, (2) design, function, and evaluation of clinical information systems, (3) clinical decision making and practice guidelines, (4) clinical decision support systems, (5) informatics support of clinical research, (6) privacy and confidentiality of clinical data, (7) standards, (8) issues in defining the clinical phenotype, and (9) topics in translational bioinformatics, including biological data types and data standards, building diagnostic and predictive tests based on genetic, epigenetic and translational data, as well as infrastructure development in translational research. Permission of the instructor required.

Tuesday and Thursday, 10:30 - 11:45 a.m., 300 George Street, Suite 501.

EXPERIMENTAL PATHOLOGY

PATH 620a, Laboratory Rotations in Experimental Pathology. Gerald Shadel.

Laboratory rotations for first-year graduate students.

PATH 680a, Seminar in Pharmacology and Molecular Medicine. Qin Yan.

Readings and discussion in topics relevant to cell biology and molecular medicine. The class emphasizes analysis of primary research literature and development of presentation skills.

Monday, 3:00 - 5:00 p.m., BML 137.

PATH 690a, Molecular Mechanisms of Disease. Michael Robek.

This course covers aspects of the fundamental molecular and cellular mechanisms underlying various human diseases. Many of the disorders discussed represent major forms of infectious, degenerative, vascular, neoplastic, and inflammatory disease. Additionally, certain rarer diseases that illustrate good models for investigation and/or application of basic biologic principles are covered in the course. The objective is to highlight advances in experimental and molecular medicine as they relate to understanding the pathogenesis of disease and the formulation of therapies.

Tuesday and Thursday, 2:00 - 3:30 p.m., TACN 203. First Class begins Tuesday, September 6th.

GENETICS

GENE 625a, Basic Concepts of Genetic Analysis. Tian Xu and staff.

The universal principles of genetic analysis in eukaryotes are discussed in lectures. Students also read a small selection of primary papers illustrating the very best of genetic analysis and dissect them in detail in the discussion sections. While other Yale graduate molecular genetics courses emphasize molecular biology, this course focuses on the concepts and logic underlying modern genetic analysis. Also MB&B 625a and MCDB 625au.

Monday and Wednesday, 11:35 - 12:50 p.m., Brady Auditorium.

GENE 645a, Statistical Methods in Human Genetics.

Probability modeling and statistical methodology for the analysis of human genetics data are presented. Topics include population genetics, single locus and polygenic inheritance, parametric and non-parametric linkage analysis, population-based association studies, family-based association studies, next generation sequencing data analysis, genome-wide association studies, genetic risk prediction models, and DNA fingerprinting.

Prerequisites: Genetics; BIS 505a and b, or equivalent; and permission of the instructor.

Thursday, 3:30 - 4:50 p.m., LEPH 126.

GENE 675a, Graduate Student Seminar. Critical Analysis & Presentation of Scientific Literature. Valentina Greco and staff.

Students gain experience in preparing and delivering seminars and in discussing presentations by other students. A variety of topics in molecular, cellular, developmental, and population genetics are covered. Required for all second-year students in Genetics. Graded Satisfactory/Unsatisfactory.

Wednesday, 1:15 - 2:15 p.m., SHM I-143.

GENE 749a, Medical Impact of Basic Science. See MB&B 749a.

GENE 840a, Medical Genetics. Margretta Seashore.

Clinical rotation, offering medical and graduate students the opportunity to participate in the Genetic Consultation Clinic, genetic rounds, consultation rounds, and genetic analysis of clinical diagnostic problems.

HTBA.

GENE 900a, First Year Introduction to Research. Frank Slack.

Lab rotations, grant writing, and ethics for Molecular Cell Biology, Genetics and Development Track students. Also CBIO 900a, MCDB 900a.

Monday, 4:00 – 5:30 p.m., KBT 102. Also CBIO 900a, MCDB 900a.

GENE 921a, Reading Course in Genetics and Molecular Biology. Charles Radding and staff.

Directed reading with faculty. Term paper required. Permission of Genetics DGS is required.

HTBA.

IMMUNOBIOLOGY

IBIO 530a/MCDB 530a^U, Biology of the Immune System. Akiko Iwasaki, Peter Cresswell, Kevan Herold, Susan Kaech, Ruslan Medzhitov, Carla Rothlin, David Schatz.

The development of the immune system. Cellular and molecular mechanisms of immune recognition. Effector responses against pathogens. Immunologic memory and vaccines. Human diseases including allergy, autoimmunity, cancer, immunodeficiency, HIV/AIDS.

Monday, Wednesday, and Fridays, 9:25 - 10:15 a.m., Room TBA.

IBIO 600a, Introduction to Research. Bing Su and staff.

Introduction to the research interests of the faculty. Required for all first-year Immunology/BBS students. Pass/Fail.

Thursdays, 5:00 p.m.

MICROBIOLOGY

MBIO 670a, Laboratory Rotations. Craig Roy.

Rotation in three laboratories. Required for all first-year graduate students.

MBIO 680a, Molecular and Cellular Processes of Parasitic Eukaryotes. Diane McMahon-Pratt, Christian Tschudi.

A broadly based seminar course on current research topics in cell and molecular parasitology with topics chosen from the current literature. Prerequisites: EMD 680a is highly recommended; permission of the instructor.

Monday and Wednesday, 10:30 - 11:50 a.m., LEPH 108.

MBIO 686a, Bacterial Determinants of Pathogenesis. Hervé Agaisse.

The course provides an introduction to basic principles in bacterial pathogenesis. Topics focus on the bacterial determinants mediating infection and pathogenesis, as well as strategies to prevent and treat diseases. Each week a lecture is given on the topic, followed by student presentations of seminal papers in the field. All participants are required to present a paper.

Tuesday and Thursday, 10:00 - 11:30 a.m., BCMM 101.

MBIO 701a, Research in Progress. Craig Roy.

All students, beginning in their third year, are required to present their research once a year at the Graduate Student Research in Progress, held on Mondays at 2 p.m. These presentations are intended to give each student practice in presenting his or her own work before a sympathetic but critical audience and to familiarize the faculty with the research.

Monday, 2:00 - 3:00 p.m., BCMM 206/208.

MBIO 702a, Microbiology Seminar Series. Craig Roy.

All students are required to attend all Microbiology seminars scheduled throughout the academic year. Microbiologists from around the world are invited to describe their research.

Thursday, 4:00 - 5:00 p.m., Hope 216.

MBIO 703a, Evasion of Host Defenses by Viruses, Bacteria and Eukaryotic Parasites. Peter Tattersall.

A required course for Microbiology first- and second-year students; not for credit. The course is offered every second year, alternating with MBIO 700a, so that it can be taken once during each student's tenure in the Program. Students present and discuss papers on the strategies employed by microbial organisms to evade either cell-intrinsic defenses, such as the induction of programmed cell death, or response operating at the level of the organism, such as adaptive immunity.

Wednesday, 5:00 - 6:30 p.m., BCMM 201. (Fall term 2011)

Other classes of interest:

MB&B 705a, Molecular Genetics of Prokaryotes. Nigel Grindley, Catherine Joyce, Christine Jacobs-Wagner.

MOLECULAR BIOPHYSICS & BIOCHEMISTRY

MB&B 520a1, Boot Camp Biology. Lynne Regan, Mark Hochstrasser, Anthony Koleske, Christian Schlieker, Valerie Horsley.

An intensive introduction to biological nomenclature, systems, processes, and techniques for graduate students with previous backgrounds in non-biological fields including physics, engineering, and computer science who wish to perform graduate research in the biological sciences. Counts as 0.5 credit toward MB&B graduate course requirements. Required for students in IGPPEB.

HTBA.

MB&B 600a, Principles of Biochemistry. Thomas Biederer, Michael Koelle

Rigorous introduction to the major concepts of biochemistry and to the process of discovery in this discipline, with emphasis on macromolecular conformation and physical processes in biochemistry. Energy metabolism, hormone signaling, and muscle contraction as examples of complex biological processes whose underlying mechanisms can be understood by identifying and analyzing the molecules responsible for these phenomena.

Tuesday and Thursday, 11:35 - 12:50 p.m., Room TBA. First meeting September 1.

MB&B 602a, Molecular Cell Biology. See CBIO 602a. Also MCDB 602a.

MB&B 625a, Basic Concepts of Genetic Analysis. See GENE 625a. Also MCDB 625a.

MB&B 635a, Mathematical Methods in Biophysics. Liz Rhoades, Yong Xiong, Corey O'Hern.

Applied mathematical methods relevant to analysis and interpretation of biophysical and biochemical data, including statistics and error analysis, differential equations, linear algebra, and Fourier transforms. The class covers both analytical and numerical implementations of these topics. Prerequisites: MATH 120a or b and MB&B 600a or equivalents, or permission of the instructors.

Monday, Wednesday, and Friday, 10:30 - 11:20 a.m., Bass 405. First meeting August 31.

MB&B 650a, Lab Rotation for First-Year Students. Mark Solomon.

Required for all first-year graduate students.

MB&B 720a, Macromolecular Structure and Biophysical Analysis. Andrew Miranker, Anna Pyle, Yong Xiong.

An in-depth analysis of macromolecular structure and its elucidation using modern methods of structural biology and biochemistry. Topics include architectural arrangements of proteins, RNA, and DNA; practical methods in structural analysis; and an introduction to diffraction and NMR. Prerequisites: physical chemistry (may be taken concurrently) and biochemistry.

Tuesday and Thursday, 11:35 - 12:50 p.m., Bass 305. First meeting September 1.

MB&B 730a, Methods and Logic in Molecular Biology. Mark Solomon, Tony Koleske, Enrique De La Cruz, Christian Schlieker.

This course examines fundamental concepts in molecular biology through intense critical analysis of the primary literature. The objective is to develop primary literature reading and critical thinking skills. Required of and open only to first-year graduate students in MB&B.

Tuesday and Thursday, 5:00 – 8:00 p.m., Bass 205. First meeting September 1.

MB&B 749a, Medical Impact of Basic Science. Joan Steitz and staff.

Consideration of examples of recent discoveries in basic science that have elucidated the molecular origins of disease or that have suggested new therapies for disease. Emphasis is placed on the fundamental principles on which these advances rely. Reading is from the primary scientific and medical literature, with emphasis on developing the ability to read this literature critically. Aimed primarily at undergraduates. Prerequisite: biochemistry or permission of the instructor.

Monday and Wednesday, 1:00 – 2:15 p.m., SHM C-103. First meeting September 1. Also GENE 749a.

MB&B 800a, Advanced Topics in Molecular Medicine. Susan Baserga, William Konigsberg.

This seminar course, which covers topics in the molecular mechanisms of disease, illustrates timely issues in areas such as protein chemistry and enzymology, intermediary metabolism, nucleic acid biochemistry, gene expression, and virology. M.D. and M.D./Ph.D. students only. Prerequisite: biochemistry (may be taken concurrently).

Monday, 11:00 – 1:00 p.m., Room TBA. First meeting TBA.

MB&B 900a, Reading Course in Biophysics.

Directed reading course in biophysics. Term paper required. By arrangement with faculty.

MB&B 902a, Reading Course in Molecular Genetics.

Directed reading course in molecular genetics. Term paper required. By arrangement with faculty.

MB&B 904a, Reading Course in Biochemistry.

Directed reading course in biochemistry. Term paper required. By arrangement with faculty.

MOLECULAR, CELLULAR & DEVELOPMENTAL BIOLOGY

MCDB 500a, Biochemistry. Ronald Breaker, Donald Engelman.

An introduction to the biochemistry of animals, plants, and microorganisms, emphasizing the relations of chemical principles and structure to the evolution and regulation of living systems.

Monday, Wednesday, and Friday, 9:25 - 10:15 a.m., OML 202.

MCDB 530a, Biology of the Immune System. See IBIO 530a.

MCDB 550a, Physiological Systems. See C&MP 550a.

MCDB 602a, Molecular Cell Biology. Sandra Wolin, Thomas Melia, Thomas Pollard, Michael Caplan, Craig Crews, Pietro De Camilli, Haifin Lin, Joseph Madri, Mark Mooseker, James Rothman, Megan King.

A comprehensive introduction to the molecular and mechanistic aspects of cell biology for graduate students in all programs. Emphasizes fundamental issues of cellular organization, regulation, biogenesis, and function at the molecular level.

Monday and Wednesday, 1:45 - 3:00 p.m., TAC N107. Also CBIO 602a, MB&B 602a.

MCDB 603a, Seminar in Molecular Cell Biology. Sandra Wolin, Thomas Melia, Thomas Pollard, Michael Caplan, Craig Crews, Pietro De Camilli, Joseph Madri, Mark Mooseker, James Rothman, Megan King.

A graduate-level seminar course in modern cell biology. The class is devoted to the reading and critical evaluation of classical and current papers. The topics are coordinated with the MCDB 602a lecture schedule. Thus, concurrent or previous enrollment in MCDB 602a is required.

Thursday, 9:00 - 11:00 a.m., SHM C-225A Also CBIO 603a.

MCDB 625a, Basic Concepts of Genetic Analysis. See GENE 625a.

MCDB 660a, Structure, Function, and Development of Vascular Plants. Graeme Berlyn.

Morphogenesis and adaptation of vascular plants considered from seed formation and germination to maturity.

Physiological and developmental processes associated with structural changes in response to environment discussed from both a phylogenetic and an adaptive point of view.

Tuesday and Thursday, 4:00 - 5:20 p.m., GML 130.

MCDB 720a, Neurobiology. Haig Keshishian, Paul Forscher.

Examination of the excitability of the nerve cell membrane as a starting point for the study of molecular, cellular, and intercellular mechanisms underlying the generation and control of behavior.

Monday, Wednesday, and Friday, 11:35 - 12:25 p.m., KBT 102. Also NBIO 720a, NSCI 720a.

MCDB 721La, Laboratory for Neurobiology. Haig Keshishian, Robert Wyman.

Optional laboratory. Introduction to the neurosciences. Projects include the study of neuronal excitability, sensory transduction, CNS function, synaptic physiology, and neuroanatomy.

Tuesday or Wednesday, 1:30 - 6:00 p.m., OML 107.

MCDB 750a, Core Topics in Biomedical Informatics. See CB&B 750a.

MCDB 900a, First-Year Introduction to Research. Frank Slack and faculty.

Lab rotations, grant writing, and ethics for Molecular Cell Biology, Genetics, and Development track students.

Monday, 4:00 - 5:30 p.m., KBT 102. Also CBIO 900a, GENE 900a.

MCDB/CBI 901 a/Gen 901, First-Year Intro to Research. Valerie Horsley.

Ethics: Scientific Integrity in Biomedical Research.

Thursday, 4:00 - 5:30 p.m., Room TBA.

MCDB 902a, Advanced Graduate Seminar. Valerie Horsley, Jo Handelsman.

This course will allow students to hone their presentation skills through yearly presentation of their dissertation work.

Two students will each give 30-minute presentations in each class session. Students will be required to present every year beginning their third year in the MCDB program. Each MCDB graduate student will be required to attend at least 80% of

the class sessions. Two faculty members will co-direct the course, attend the seminars, and provide feedback to the students.

Tuesday, 11:30 – 1:00 p.m., KBT 102.

MCDB 950a, Second-Year Research.

By arrangement with faculty.

HTBA.

NEUROSCIENCE

NSCI 501a, Principles of Neuroscience. Ralph DiLeone, Marina Picciotto, Mark Yeckel.

General neuroscience seminar: Lectures, readings and discussion of selected topics in neuroscience. Emphasis will be on how approaches at the molecular, cellular, physiological and organismal levels can lead to understanding of neuronal and brain function.

Wednesday and Friday, 3:15 – 4:45 p.m., SHM I 116.

NSCI 519a, Tutorial

By arrangement with faculty and approval of DGS.

NSCI 521a/PHAR 521a, Neuroimaging in Neuropsychiatry I: Imaging Methods. Kelly Cosgrove, Hilary Blumberg.

Neuroimaging methodologies including Positron Emission Tomography (PET); Single Photon Emission Computed Tomography (SPECT); Magnetic Resonance Imaging (MRI); functional Magnetic Resonance Imaging (fMRI); Magnetic Resonance Spectroscopy (MRS), and gene array imaging (GAI) are rapidly evolving tools used to study the living human brain. Neuroimaging has unprecedented implications for routine clinical diagnosis, for assessment of drug efficacy; for determination of psychotropic drug occupancy and for the study of pathophysiological mechanisms underlying neurologic and psychiatric disorders. This course is designed to provide an overview of the theory and current state of development of the different neuroimaging modalities. A second course, offered in the spring, will focus upon applications.

Thursdays, 9:00 – 10:30 a.m., Room TBA.

NSCI 523a/ENAS 880a, Imaging Drugs in the Brain. Evan Morris, Kelly Cosgrove, Wendol Williams.

Seminar course to explore the uses of PET, SPECT, and fMRI to study the mechanisms of action, and long term effects of drugs (legal and illegal) on brain function. Basic research will be the main focus, augmented by two class periods allotted to uses of imaging in drug development by Pharma. Syllabus will be comprised of review articles, book chapters and journal articles. Some class periods will begin with short lecture to cover methodological concepts followed by discussion of reading material.

Tuesdays, 3:30 – 5:30 p.m., Room TBA.

NSCI 720a/MCDB 720a, Neurobiology. Haig Keshishian, Paul Forscher.

Examination of the excitability of the nerve cell membrane provides a starting point for the study of molecular, cellular and intracellular mechanisms underlying the generation and control of behavior.

Monday, Wednesday, and Friday, 11:35 - 12:25 p.m., KBT 102.

PHARMACOLOGY

PHARM 502a/PATH 680a, Seminar in Pharmacology and Molecular Medicine. See PATH 680a

PHARM 504a, Principles of Pharmacology. Elias Lolis.

Lectures covering Pharmacokinetics, enzyme kinetics, drug discovery and design, molecular basis of antimicrobial, cancer, and viral therapy, immunopharmacology, asthma, allergy, and cardiovascular pharmacology

Monday and Wednesday, 10:45 - 12:15 p.m., Giarman Room, SHM B-201.

PHARM 506a, Methods in Pharmacological Research (Rotations). Elias Lolis.

Students work in laboratories of faculty of their choice.

HTBA.

PHARM 528a, Principles of Signal Transduction. Anton Bennett.

The regulation of intracellular signaling is of fundamental importance to the understanding of cell function and regulation.

This course will introduce the broad principles of intracellular signal transduction. More detailed lectures on specific intracellular signaling pathways will be given where students will learn both the basic and most recent and cutting edge concepts of intracellular signaling. Topics covered will include regulation of signaling by protein phosphorylation, small G-proteins, G protein-coupled receptors, hormones, phospholipids, adhesion and gasses.

Tuesday and Thursday, 10:30 - 12:00 p.m., Giarman Room, SHM B-201.