Pharmacology

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Administration:
Head of the Department: Asrar B. Malik
Directors of Graduate Studies: Jaehyung "Gus" Cho and Randal A. Skidgel

Program Codes:
20FS5552MS (MS)
20FS5552PHD (PhD)

The Department of Pharmacology offers work leading to a degree in Cellular and Molecular Pharmacology at the doctoral level and participates in the Medical Scientist Training Program (see the Medical Scientist Training Program [http://www.uic.edu/gcat/colleges-schools/medicine/pcol/phd] section for more information). The departmental faculty conduct translational research focusing on cellular signal transduction, lung and vascular biology, thrombosis, stem cell therapy, inflammation, and cardiovascular pharmacology. Research in these areas is pursued at the molecular, cellular, organ-system, and whole-animal levels of investigation using state-of-the-art techniques and instrumentation.

Admission and Degree Requirements

- MS in Cellular and Molecular Pharmacology (See listing for PhD in Cellular and Molecular Pharmacology)
- PhD in Cellular and Molecular Pharmacology [http://catalog.uic.edu/gcat/colleges-schools/medicine/pcol/phd]

Pharmacology Courses

PCOL 430. Principles of Toxicology. 2 hours.
Examines the toxic effects of drugs and chemicals on organ systems. Lectures emphasize basic principles, effects on specific organ systems, major classes of toxic chemicals, and specialized topics such as forensic and industrial toxicology. Course Information: Same as BPS 430. Credit is not given for PCOL 430 if the student has credit for EOHS 457.

PCOL 510. Molecular Pharmacology of Platelets, Thrombosis and Vascular System. 2 hours.
Molecular mechanism and therapeutic approaches to: platelet functions, thrombosis, hemostasis, and vascular biology. The platelet as a model cell for molecular mechanisms of intracellular signal transduction and cell adhesion. Course Information: Prerequisite(s): Credit or concurrent registration in GCLS 501 and GCLS 503; or consent of the instructor.

PCOL 530. Pharmacology and Biology of the Vessel Wall. 2 hours.
Regulation of physiological and pathological processes in the cardiovascular system; e.g. endothelial barrier, cell adhesion, smooth muscle proliferation, angiogenesis, endothelial gene expression. Pharmacological treatment of cardiovascular diseases. Course Information: Prerequisite(s): Credit or concurrent registration in GCLS 501 and GCLS 503; and consent of the instructor.

PCOL 540. Ion Channels: Structure, Function, Pharmacology and Pathology. 2 hours.
The concept of ion channels is treated from the perspectives of their molecular structures and functions. Modulation, pathological conditions (channelopathies), and pharmacological intervention will also be treated. Course Information: Same as PHYB 540. Recommended background: One undergraduate course in Biochemistry and one in Physiology, or consent of the instructor.

PCOL 550. The Biology and Pharmacology of the Lung. 2 hours.
Covers topics in lung biology and physiology. The importance of impaired lung function in inducing lung diseases and potential therapeutics will be discussed. Course Information: Prerequisite(s): Credit or concurrent registration in GCLS 501; and Credit or concurrent registration in GCLS 503; or consent of the instructor.

PCOL 560. Graduate Pharmacology. 3 hours.
General principles of molecular mechanisms of drug action in selected areas of pharmacology such as factors altering pharmacokinetics and pharmacodynamics. Mechanisms of cardiovascular and pulmonary disease and cancer will be focused. Course Information: Recommended background: GCLS 501 and GCLS 502 and GCLS 503. Class Schedule Information: To be properly registered, students must enroll in one Lecture-Discussion and one Discussion.

PCOL 594. Special Topics. 1 hour.
Organized presentation and discussion of rapidly developing research areas in molecular, cellular and systems pharmacology. Course Information: May be repeated. Prerequisite(s): Consent of the instructor.

PCOL 595. Pharmacology Seminar. 1 hour.
Presentation of research and/or current literature by invited lecturers and students. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated.

PCOL 598. M.S. Thesis Research. 0-16 hours.
Thesis work under the supervision of a graduate advisor. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated.

PCOL 599. Ph.D. Thesis Research. 0-16 hours.
Thesis work under the supervision of a graduate advisor. Course Information: Satisfactory/Unsatisfactory grading only.

Graduate College Life Sciences Courses

GCLS 500. Physiology. 3 hours.
Lectures in human physiology. Emphasis is on an integrated approach to systems physiology. Course Information: Restricted to students enrolled in a graduate program offered through the College of Medicine or Pharmacy or Applied Health Sciences or in the Departments of Bioengineering or Biological Sciences, or consent of the instructor. Prerequisite(s): Mathematics, undergraduate physics, organic chemistry, or consent of the instructor.
GCLS 501. Biochemistry. 3 hours.
Fundamental properties of biomacromolecules, the thermodynamics underlying basic biochemical processes and the properties of enzymes, including the kinetics of operation, and regulation, illustrated with important examples. Course Information: Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor. Prerequisite(s): Recommended background: Coursework in organic and physical chemistry.

GCLS 502. Molecular Biology. 3 hours.
Core molecular biology course covering basic principles of gene expression, genome replication and molecular interactions important to biological processes in prokaryotes and eukaryotes. Course Information: Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

GCLS 503. Cell Biology. 3 hours.
Advanced course on fundamental aspects of cell biology; basic concepts will be integrated with key examples which span gene, protein, cell, and tissue function. Course Information: Credit is not given for GCLS 503 if the student has credit in BCHE 561 or ANAT 585 or MIM 585 or PHYB 585. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine, Pharmacy, or Applied Health or the departments of Bioengineering or Biological Sciences or consent of the instructor.

GCLS 504. Research Methods I. 1-2 hours.
Lectures, demonstrations, and discussions concerned with principles and practical aspects of modern quantitative biochemical, molecular biological, physiological and biophysical methodology such as separation techniques and studies of biomembranes. Course Information: May be repeated. Students may register for more than one section per term. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

GCLS 505. Research Methods II. 1-3 hours.
Lectures, demonstrations, and discussions concerned with principles and practical aspects of modern quantitative biochemical, molecular biological, physiological and biophysical methodology such as bioimaging and biochemical analysis. Course Information: May be repeated. Students may register for more than one section per term. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

GCLS 506. GEMS Research Rotation. 2-5 hours.
Research rotation course in which first year students from the GEMS program will undertake research projects in laboratories affiliated with this program. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated. Animals used in instruction. Prerequisite(s): Open only to Ph.D. degree students.

GCLS 510. Integrative Biology. 3 hours.
Advanced level, intensive course addressing fundamental topics of developmental biology, immunology, and cancer biology, with concentration on thematic issues that integrate these subjects. Course Information: Prerequisite(s): GCLS 501 and GCLS 502 and GCLS 503; or demonstrated proficiency of the material covered in these courses. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

GCLS 511. Molecular Genetics. 3 hours.
Core molecular genetics course covering classical and molecular principles of microbial and Mendelian genetics. Systems covered include bacteria, bacteriophage, animal viruses, yeast, Drosophila, mouse, and human. Course Information: Prerequisite(s): GCLS 501 and GCLS 502 and GCLS 503; or demonstrated proficiency of the material covered in these courses. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

GCLS 512. Pathobiology of Cancer. 3 hours.
Introduction to principles of carcinogenesis, tumor biology, and oncology, including cancer epidemiology, molecular-cellular basis of cancer, tumor progression, invasion and metastasis, and prevention, detection, diagnosis, and therapy of cancer. Course Information: Same as PATH 511. Prerequisite(s): Consent of the instructor. Recommended background: Basic knowledge of molecular and cell biology is highly recommended.

GCLS 515. Receptor Pharmacology and Cell Signaling. 3 hours.
Advanced course on cell-surface and nuclear receptors and mechanisms of signaling through receptors. Provides an overview of receptor theory, hands-on data analysis and lectures and discussions on various signaling mechanisms. Course Information: Credit is not given for GCLS 515 if the student has credit in PCOL 505 or PHYB 505. Prerequisite(s): GCLS 501 or approval of the department. Restricted to students enrolled in a graduate program offered through the Colleges of Medicine or Pharmacy or the departments of Bioengineering or Biological Sciences or consent of the instructor.

GCLS 594. Special Topics in Life Sciences. 1-4 hours.
Systematic study of advanced selected topics in life sciences from an interdisciplinary approach. Course Information: May be repeated. Students may register in more than one section per term. Prerequisite(s): Consent of the instructor.