

Neuroscience and Pharmacology

Chair

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Faculty: <https://medicine.uiowa.edu/neuroscience-and-pharmacology/people>

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Courses

Neuroscience and Pharmacology Courses

PCOL:2220 Drug Use and Abuse 3 s.h.

Effects of common drugs on the body and how they occur; consumer education in easy-to-understand language; basic principles of pharmacology and toxicology; drugs that work on specific systems including antibiotics, oral contraceptives, sedatives, stimulants, hallucinogens, narcotics, steroids, diabetes drugs, and cancer drugs; for students with little to no science background. Offered spring semesters. GE: Natural Sciences without Lab.

PCOL:3101 Pharmacology I: A Drug's Fantastic Journey 3 s.h.

Introduction to basic pharmacological principles by following a drug's journey from its site of administration to its site of elimination; common mechanisms by which drugs affect the body and mechanisms underlying drug actions on two primary body systems—nervous and cardiovascular; structured learning environment bolstered by highly interactive application sessions where students apply course material via collaborative work on problem sets/activities; for students interested in medicine, pharmacy, research, and industry. Offered fall semesters. Prerequisites: (CBE:3205 or BIOL:1411) and CHEM:1110. Recommendations: additional higher-level biology and chemistry courses helpful.

PCOL:3102 Pharmacology II: Mechanisms of Drug Action 3 s.h.

Expansion of basic pharmacological concepts and further exploration of how they are applied to define a drug's actions on the body; students continue their exploration of the body by discussing various disorders including neuropsychiatric and immune disorders, cancer, diabetes, and microbial infections in conjunction with current treatments; structured learning environment bolstered by highly interactive discussion sessions where students learn to apply course material via collaborative work on problem sets/activities; for students interested in medicine, pharmacy, research, and industry. Offered spring semesters. Prerequisites: PCOL:3101. Recommendations: additional higher-level courses in biology and chemistry helpful.

PCOL:4130 Drug Mechanisms and Actions 3 s.h.

Pharmacology of major drugs in use today; basic principles underlying drug action and disposition; physiology, biochemistry, and pathophysiology of specific organ systems; how various drugs impact these systems and how they treat disorders of each system; major adverse effects of drugs and how those occur; differences among drugs within each drug group. Offered spring semesters. Requirements: undergraduate biochemistry and physiology courses.

PCOL:4199 Undergraduate Research in Neuroscience and Pharmacology arr.

Experimental research under faculty supervision in department laboratories.

PCOL:5130 Fundamentals of Pharmacology 3 s.h.

Basic pharmacological principles underlying drug absorption, distribution, and metabolism; how these processes determine drug dosing; drug receptor interactions and their quantitation; impact of genetic variation on the actions and metabolism of drugs; mechanisms of neurotransmission focusing on synthesis, release, actions, and degradation; central nervous system (CNS) pathways for major neurotransmitters; disease states involving various abnormal neurotransmitter function. Offered spring semesters.

PCOL:5135 Principles of Pharmacology 1 s.h.

Basic pharmacological principles underlying drug absorption, drug distribution throughout the body, drug metabolism, and drug elimination; how these processes determine drug dosing and the means by which dosing parameters are characterized; drug receptor interactions and their quantitation. Offered spring semesters.

PCOL:5136 Pharmacogenetics and Pharmacogenomics 1 s.h.

Impact of genetic variation on the actions and metabolism of drugs; database search techniques to identify variants. Offered spring semesters. Recommendations: PCOL:5135, and undergraduate or graduate biochemistry and/or genetics.

PCOL:5137 Neurotransmitters 1 s.h.

Mechanisms of neurotransmission focusing on mechanisms of synthesis, regulation of release, mechanisms of action, means of degradation, and CNS pathways for major neurotransmitters; disease states involving various neurotransmitter systems. Offered spring semesters.

PCOL:5204 Basic Biostatistics and Experimental Design 1 s.h.

Overview of theory of experimental design and data analysis in biological sciences; types of analyses available for common types of data generated in biomedical sciences; review of statistical methods used in published studies; cursory coverage of mathematical computations involved in various analytical tests. Offered fall semesters.

PCOL:6015 Topics in Pharmacology and Neuroscience 1 s.h.

Recent advances in pharmacology, neuropharmacology, developmental neurobiology, neuroendocrinology, and related neurosciences.

PCOL:6080 Pharmacology Seminar 1 s.h.

PCOL:6090 Graduate Research in Pharmacology arr.

PCOL:6099 Special Topics in Pharmacology arr.

PCOL:6203 Pharmacology for Graduate Students 5 s.h.

Pharmacology of all major drugs in use today; discussion of basic principles underlying drug actions and disposition; physiology, biochemistry, and pathophysiology of specific organ systems; how various drugs impact these systems; how drugs are used to treat disorders of each system; major adverse effects of drugs and how those occur; differences among drugs within each drug group. Offered fall semesters. Prerequisites: BMED:5207 and MPB:5153.

PCOL:6204 Pharmacology for Health Sciences: Nurse Anesthetist 5 s.h.

Pharmacology of all major drugs in use today; discussion of basic principles underlying drug actions and disposition; physiology, biochemistry, and pathophysiology of specific organ systems; how various drugs impact these systems; how drugs are used to treat disorders of each system; major adverse effects of drugs and how those occur; differences among drugs within each drug group. Offered fall semesters. Prerequisites: MPB:5200 and NURS:6000. Requirements: enrollment in Anesthesia Nursing Program.

PCOL:6207 Ion Channel Pharmacology 1 s.h.

Heuristic, semiquantitative approach to concepts in ion channel physiology and pharmacology; up-to-date physical principles, classification, and structure/function relationships for major voltage-gated ion channels that facilitate application of abstract concepts to physiological, pharmacological, and general biological problems. Offered spring semesters.

PCOL:6210 Receptors and Cell Signaling 3 s.h.

Mechanisms of signaling by growth factors, cytokines and related molecules; principles of ion channel physiology and pharmacology; structure-function relationships of small molecular weight and heteromeric G proteins; G protein-coupled receptors; genomic and nongenomic actions of intracellular receptors; basis for actions of novel new ligands on intracellular receptors. Offered spring semesters.

PCOL:6225 Growth Factor Receptor Signaling 1 s.h.

Mechanisms of signaling by growth factors; cytokines and related molecules that regulate cell proliferation, development, differentiation, and survival; emphasis on molecular mechanisms of signaling and relevance of these signaling processes to various human diseases. Offered fall semesters.

PCOL:6250 Advanced Problem Solving in Pharmacological Sciences 1 s.h.

Discussion of methodologies, strategies, and approaches commonly used to solve pharmacological sciences problems; use of interpersonal problem-solving skills to develop experimental study plans for solving contemporary scientific problems in pharmacology. Offered fall and spring semesters.