Pharmacological Sciences

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http://www.pharmacology.uci.edu/
Olivier Civelli, Department Chair
Geoffrey W. Abbott, Department Vice Chair and Graduate Program Director/Advisor

The primary graduate program for the Department of Pharmacology direct-admit students is the interdisciplinary graduate program in Pharmacological Sciences. The Department of Pharmacology joined forces with the Department of Pharmaceutical Sciences to offer an interdisciplinary program leading to the Ph.D. degree in Pharmacological Sciences. For complete program information, see the Interdisciplinary Studies (catalogue.uci.edu/previouseditions/2013-14/ interdisciplinarystudies/pharmacologyandtoxicology) section of the Catalogue.

The Department of Pharmacology also admits students through the following two gateway programs:

Graduate Gateway Program in Medicinal Chemistry and Pharmacology (MCP). The one-year graduate MCP Gateway Program is designed to function in concert with selected department programs, including the Ph.D. in Pharmacological Sciences. Upon successful completion of the MCP curriculum at the end of their first year, students choose a faculty advisor who is affiliated with one of the participating departments, and transition into their “home” department to complete the remaining degree requirements. They will receive their Ph.D. degree from the department of their chosen advisor. Detailed information is available at http://www.pharmacology.uci.edu/.

The Department also participates in the Interdepartmental Neuroscience Gateway Program, described in the School of Biological Sciences section of the Catalogue. Students who select a focus in Neuroscience and a research advisor in the Department begin following the departmental requirements for the Ph.D. at the beginning of their second year and will receive their Ph.D. from the department of their chosen advisor. Detailed information is available at http://www.inp.uci.edu/research/facsort_dept_list.cfm?department=15.

Graduate Program Faculty
Geoffrey W. Abbott: Biology and pharmacology of voltage-gated potassium channels, voltage-independent potassium channels, and ion transporters
Emiliana Borrelli (Joint): Dopamine signaling and drugs of addiction; mouse models of neurological and neuropsychiatric disorders
Olivier Civelli: Molecular biology of G protein-coupled receptors; discovery of novel neuropeptides; functional characterization of novel neuropeptides, discovery of active components of traditional Chinese medicines
Frederick J. Ehlert: Muscarinic receptor coupling mechanisms; functional role of muscarinic receptor subtypes; pharmacological methods of analysis; analysis of drug receptor interactions
Pietro R. Galassetti (Joint): Physiological and altered adaptive responses to stress in healthy and dysmetabolic children and adults; non-invasive monitoring of metabolic variables through analysis of exhaled gases
Kelvin W. Gee: Pharmacology of allosteric modulators of the GABA_A receptor, selective modulation of GABA_A receptor subtypes; novel molecular targets for neuropharmacological agents and drug discovery
Naoto Hoshi: Physiological role and regulation of the M-channel, molecular biology, electrophysiology and live cell FRET imaging
Mahtab Jafari (Joint): Anti-aging effects of botanicals and pharmaceutical compounds; the impact of botanical extracts on mitochondrial bioenergetics, oxidative stress, and other pathways of aging using cell culture and Drosophila
Frances M. Leslie: Addiction, drugs of abuse and brain development
Z. David Luo (Joint): Molecular mechanisms of pain transduction; study gene regulation and signaling pathways in chronic pain processing using animal models, and molecular biology techniques
Daniele Piomelli (Joint): Lipid-derived signaling, special emphasis on endogenous cannabinoids; role in pain, mental health and inflammation; cellular and system pharmacology and medicinal chemistry used to identify pharmacological agents that interfere with the functions exerted by endocannabinoids and other signaling lipids
Rainer K. Reinscheid (Joint): Neuropharmacology of peptide transmitters involved in stress, sleep and memory using cellular and transgenic animal models
Qun-Yong Zhou: Pharmacology and physiology of prokineticins and prokineticin receptors
Xiaolin Zi (Joint): Cancer prevention and treatment using novel naturally occurring compounds and the study of their underlying molecular mechanisms; secreted Wnt antagonists in cancer growth and metastasis

Courses
PHARM 210. Chemical Neuroanatomy. 4 Units.
Organization of the nervous system, especially with respect to chemical identity of elements, for students of pharmacology. Major cell types, methods of study, ultrastructure, synaptic organization of functionally defined systems, localization of chemically defined cells and receptors, and brain development.
Restriction: Graduate students only.

PHARM 241. Advanced Topics in Pharmacology. 2 Units.
Application of pharmacological principles in disease therapy. Advanced pharmacological mechanisms and in-depth study of drug action. Discussion of several major drug classes/therapeutic strategies: molecular mechanisms of action, physiological consequences of administration, and clinical use.
PHARM 241B. Graduate Pharmacology. 6 Units.

Prerequisite: PHYSIO 206A and PHYSIO 206B and BIOCHEM 210A.

PHARM 252. Neurotransmitter and Drug Receptors. 6 Units.
Ligand gated ion channels, G protein linked receptors, receptor tyrosine kinases, ligand regulated transcription factors, their signaling mechanisms, trafficking and physiological responses. Analysis of receptor properties by pharmacological methods, radioligand binding, and molecular biology.

PHARM 254. Introduction to Pharmacology. 4 Units.
Receptor analysis: bioassay measuring contraction, calcium mobilization, second messenger responses; operant conditioning: whole animal, single neuron; radioligand binding; quantitative autoradiography; immunocytochemistry; in situ hybridization for analysis of mRNA; Western and Northern analysis; transgenic mouse knock in and knock out techniques.

PHARM 255. Chemical Transmission. 4 Units.
Mechanisms underlying chemical signaling processes in the brain and periphery. Molecular biology, signal transduction, transmitter synthesis and inactivation, pharmacology of integrative function and behavior.

PHARM 256. Experimental Design for Pharmacologists. 1 Unit.
Population and sample statistics, hypothesis testing, analysis of variance, nonparametric statistics, experimental design, power, and the use of statistical computer software.

Prerequisite: PHARM 252.

PHARM 257. Ethics in Research. 1 Unit.
Ethical conduct in research including data handling, authorship, conflict of interest, animal rights, handling of misconduct.

Prerequisite: PHARM 299.

Repeatability: May be taken for credit 2 times.

PHARM 298. Seminar. 2 Units.
Presentation and discussion of current problems and methods in teaching and research in pharmacology, toxicology, and therapeutics.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.

PHARM 299. Research. 1-12 Units.
Independent research with Pharmacology and Toxicology faculty.

Repeatability: May be repeated for credit unlimited times.

Restriction: Graduate students only.