Pharmacological and Physiological Science

Saint Louis University is a Catholic, Jesuit institution that values academic excellence, life-changing research, compassionate health care, and a strong commitment to faith and service.

Founded in 1818, the University fosters the intellectual and character development of nearly 14,000 students on two campuses in St. Louis, Missouri, and Madrid, Spain. Building on a legacy of nearly 200 years, Saint Louis University continues to move forward with an unwavering commitment to a higher purpose, a greater good.

OVERVIEW

The goal of our training program is to prepare individuals for a research and teaching career in pharmacology and physiology. To this end, we strive to instill enthusiasm for discovery and the scientific process and to foster the development of critical thinking skills. Our comprehensive program is designed to develop laboratory research competence, including proficiency in quantitative methods of biology, physiology and pharmacology. We seek to graduate students with excellent oral and written communication skills by encouraging active participation in journal clubs, seminar series and teaching.

Research training is offered with particular emphasis on cellular communication and disease exerted through the endocrine, cardiovascular and nervous systems as well as developmental biology. The broad objectives of the research programs are to:

• Investigate the mechanisms and action of receptors and intracellular signal transduction systems at the cellular and molecular level.
• Understand how various drugs perturb these systems at both the level of the cell and the level of the whole animal.
• Discover and develop new chemical probes to investigate biological systems.
• Gain a better understanding of the pathophysiological mechanisms involved in disrupting cellular communications.

Strict attention is given to the integration of advances made with simplified systems (genes, enzyme or receptor) into more complex systems (cell, organ and organism). This approach affords the development of an appreciation of drug action from an effect on a gene, receptor or enzyme to the therapeutic use of a drug to treat human disease.

Students in good standing enter the graduate program in pharmacological and physiological science after completing one year in the core basic biomedical sciences program. In exceptional cases, students are directly admitted without completing the core curriculum. These students typically possess an advanced degree (i.e. Master of Science) and often have workplace experience. In August of each year, newly admitted students start a year of didactic training (20 credit hours) weighted towards advanced topics in pharmacology and physiology.

All classes have morning schedules, leaving the afternoons and evenings free for research. These courses are followed first by a preliminary examination that takes the form of the specific aims and research strategies sections of an NIH R01 application, and then two to three years of graduate work devoted almost exclusively to research related to their dissertation project. Graduation follows successful completion of a written thesis, and public and private oral defenses. The average time to graduation with a Ph.D. in pharmacological and physiological science is about five years.

There are five required courses covering pharmacology, physiology, statistics and bioinformatics. Students may elect to take additional courses in other departments at Saint Louis University, or cross register for courses at Washington University in St. Louis and the University of Missouri-St. Louis.

An innovative feature of our training program is the teaching opportunities afforded our trainees. Foremost is the undergraduate course called Drugs We Use and Abuse. This is administered and taught entirely by our graduate students to about 75 undergraduate students at the main campus of Saint Louis University. The course consists of 35 lectures per year plus discussion sessions. Typically, each graduate student in our program is responsible for three or four lectures on a variety of subjects. If desired, these student-teachers may apply for evaluation by the Reinhart Center for Transformative Teaching and Learning to receive an independent review of their performance and receive advice on how to improve their teaching skills.
SCHOOL OF MEDICINE
Pharmacological and Physiological Science

FACULTY

Michael Ariel, Ph.D.: Sensorimotor information processing from visual and vestibular inputs that control eye movements
Joseph J. Baldassare, Ph.D.: Cell-cycle regulation and intracellular signal transduction mechanisms
Thomas P. Burris, Ph.D.: Nuclear receptor pharmacology and drug discovery
Andrew A. Butler, Ph.D.: Neuroendocrine and circadian regulation of metabolism
John C. Chrvìa, Ph.D.: Transcriptional regulation by coactivators and nuclear receptors
Terrance M. Egan, Ph.D.: Receptor and voltage gated ion channels
Decha Enkvetchakul, M.D.: Structural mechanisms underlying modulation of KirBac1.1 channel activity by membrane lipids and protons
Amy B. Harkins, Ph.D.: Cellular and molecular mechanisms of synaptic vesicle release, calcium channels
Mark M. Knuepfer, Ph.D.: Autonomic pharmacology and physiology; central cardiovascular regulation; electrophysiology; effects of cocaine, stress and endotoxemia
Andrew J. Lechner, Ph.D.: Pulmonary physiology, acute lung injury and the immunophysiology of sepsis
Heather Macarthur, Ph.D.: Vascular control mechanisms, endothelial mediators, sympathetic neurotransmission
Wendi S. Neckameyer, Ph.D.: Development and function of neural circuitry
W. Michael Panneton, Ph.D.: The etiology of Parkinson’s disease, neural pathways and pain
Daniela Salvemini, Ph.D.: Role of reactive oxygen and nitrogen species and lipid mediators in acute and chronic pain and in the development of opiate antinociceptive tolerance
Willis K. Samaan, Ph.D.: Neuropeptides and the control of cardiovascular function and stress hormone secretion
Mark M. Voigt, Ph.D.: Biochemical and molecular neuropsychopharmacology and neuroscience, molecular biology, development of sensory neurons in zebrafish
John K. Walker, Ph.D.: Synthetic and medicinal chemistry to study potential new biologically relevant pathways or develop new therapeutic agents
Thomas C. Westfall, Ph.D.: Biochemical neuropharmacology, monoamine and peptide regulation, autonomic pharmacology and cardiovascular science
Daniel S. Zahm, Ph.D.: Neuroanatomical and functional organization of basal forebrain, neurodegeneration, role of peptides in psychostimulant and opioid actions
Jinsong Zhang, Ph.D.: Dysregulation of gene expression at the level of transcription with relevance to leukemia, cancer and obesity

APPLICATION DEADLINE
Ph.D.
FALL: Feb. 1
SPRING: N/A
SUMMER: N/A

DEGREES OFFERED
• Doctor of Philosophy (Ph.D.)

COURSES AVAILABLE
DAYS ☑ NIGHTS ☐ WEEKENDS ☐ ONLINE ☐

APPLICATION REQUIREMENTS
• Transcript(s)
• Three letters of recommendation
• GRE G scores (GRE S optional)
• Résumé
• Professional goal statement
• Interview

FINANCIAL SUPPORT
All students receive a nationally competitive student stipend, tuition waivers and health insurance as long as they remain in good standing in the program.

CONTACT INFORMATION
Pharmacological and Physiological Science
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WEB: medschool.slu.edu/pharmphys

DEADLINE FOR ASSISTANTSHIPS ARE LISTED ONLINE.

FALL 2015
SPRING 2015
SUMMER 2015

SAINT LOUIS UNIVERSITY
Higher purpose. Greater good.”

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