SAINT LOUIS UNIVERSITY

GRADUATE EDUCATION

Pharmacology and Physiology

Saint Louis University is a world-class Catholic, Jesuit institution educating nearly 13,000 students on two dynamic, urban campuses - in St. Louis, Missouri, and Madrid, Spain. Founded in 1818, the University is celebrating its bicentennial.

With a legacy of innovative academics and research, compassionate health care and faithful service, Saint Louis University attracts a diverse community of scholars who push intellectual boundaries in pursuit of creative, meaningful ways to impact the world, striving to serve a higher purpose and seek 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. 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 and encourage 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.

CONTACT INFORMATION

Pharmacology and Physiology

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APPLICATION DEADLINE

Ph.D.

FALL | Feb. 1
SPRING | N/A
SUMMER | Feb. 1

Deadlines for assistantships are listed online.

DEGREES & PROGRAMS

Doctor of Philosophy (Ph.D.)

COURSES AVAILABLE

DAYS x NIGHTS ☐ WEEKEND ☐ ONLINE ☐

APPLICATION REQUIREMENTS

- Application form and fee (if applicable)
- Transcript(s)
- Three letters of recommendation
- GRE G scores (GRE S optional)
- Résumé or curriculum vitae
- Professional goal statement
- Interview

ADMISSION CRITERIA

Applicants should have a bachelor’s degree with a background in biology, chemistry (general and organic; physical chemistry recommended, but not required), physics and mathematics (including calculus). Qualified candidates who are deficient in certain prerequisites may be admitted with the expectation that the deficiencies will be rectified while in residence.
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. Chrvia, Ph.D.: Transcriptional regulation by coactivators and nuclear receptors

Terrance M. Egan, Ph.D.: Receptor and voltage gated ion channels

Colin Flaveney, Ph.D.: Pharmacological targeting of LXR to treat prostate cancer

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

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. Samson, Ph.D.: Neuropeptides and the control of cardiovascular function and stress hormone secretion

Mark M. Voigt, Ph.D.: Biochemical and molecular neuropharmacology 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

Gina Yosten, Ph.D.: Role of orphan GPCRs in obesity- and diabetes-associated cardiovascular disease

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

Our graduate program maintains a rich history of national recognition in graduate education and research.

Many graduates have prominent positions in academia, government and industry. The Department has been awarded Training Grants from the National Institutes of Health.

We have an excellent success record in obtaining national funding from such sources as the National Institutes of Health, National Science Foundation, and other nationally recognized funding agencies.

All students receive a nationally competitive student stipend, tuition waivers and health insurance as long as they remain in good standing in the program. Students are also eligible for support by a long-standing NIH T32 Training Grant in Pharmacological Sciences.