PHARMACOLOGY & PHYSIOLOGICAL SCIENCE, PH.D.

Saint Louis University's Pharmacology and Physiological Science Ph.D. program in the Department of Pharmacological and Physiological Science is designed to prepare students for a career in research and teaching in this area of biomedical science.

The program combines formal coursework, advanced seminars, lab rotations and in-depth training in one of the laboratories of the faculty. Faculty members available as mentors have diversified backgrounds in the fields of biochemistry, molecular biology, nuclear receptors, neuroscience, pharmacology and physiology.

Major areas for research specialization include neurotransmitter biochemistry, physiology and pharmacology; molecular biochemistry and molecular pharmacology of neurotransmitter, autacoid, neurohormone and hormone receptors and their signaling mechanisms; electrophysiology; neurochemistry; cardiovascular control mechanisms; molecular cellular and endocrine control mechanisms, neuropharmacology, and pharmacology of drugs of abuse.

The comprehensive program in pharmacological and physiological science is designed to help students develop laboratory research competence, including proficiency in quantitative methods of biology, physiology and pharmacology.

All classes have morning schedules, leaving the afternoons and evenings free for research. Coursework is followed by a preliminary examination that takes the form of the specific aims and research strategies sections of an NIH R01 application. Students will then complete two to three years of graduate work devoted almost exclusively to research related to the dissertation project. Successful completion of a written thesis and public and private oral defenses are required for graduation. The program is completed in five years, on average.

Entering the Program

Students in good academic 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 credits) weighted towards advanced topics in pharmacology and physiology.

Curriculum Overview

Students pursuing graduate studies in pharmacological and physiological science will have a unique opportunity to teach during training. The undergraduate course called "Drugs We Use and Abuse" is administered and taught entirely by graduate students to about 75 undergraduate students.

The course consists of 35 lectures per year, plus discussion sessions. Typically, each graduate student the program is responsible for three or four lectures on a variety of subjects. These student-teachers may apply for evaluation by the Reinert Center for Transformative Teaching and Learning to receive an independent review of their performance and advice on how to improve their teaching skills.

Fieldwork and Research Opportunities

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.

Careers

Graduates of the program are technically skilled and thoughtful scientists prepared for successful research careers in academics, industry, medicine or government.

Admission Requirements

Successful applicants possess an above-average GPA, sufficient GRE scores and sufficient TOEFL score (for international students).

Application Requirements

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

Requirements for International Students

All admission policies and requirements for domestic students apply to international students along with the following:

- Demonstrate English Language Proficiency (http://catalog.slu.edu/academic-policies/office-admission/undergraduate/english-language-proficiency)
- Proof of financial support must include:
  - A letter of financial support from the person(s) or sponsoring agency funding the time at Saint Louis University
  - A letter from the sponsor's bank verifying that the funds are available and will be so for the duration of study at the University
- Academic records, in English translation, of students who have undertaken postsecondary studies outside the United States must include the courses taken and/or lectures attended, practical laboratory work, the maximum and minimum grades attainable, the
grades earned or the results of all end-of-term examinations, and any honors or degrees received. WES and ECE transcripts are accepted.

**Application Deadline**

Students must submit the application by Feb. 1.

**Review Process**

A committee examines and reviews the applicant and application wholly.

**Scholarships and Financial Aid**

For more information, visit the student financial services office online at [http://finaid.slu.edu](http://finaid.slu.edu).

**Requirements**

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<tr>
<td>BBS 5010</td>
<td>Basic Biomedical Science I</td>
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<td>BBS 5020</td>
<td>Special Topics in Basic Biomedical Sciences I</td>
<td>4</td>
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<td>BBS 5030</td>
<td>Basic Biomedical Science II</td>
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<td>BBS 5040</td>
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<td>BBS 5100</td>
<td>Ethics for Research Scientists</td>
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<td>BBS 5920</td>
<td>Basic Biomedical Sciences Colloquium</td>
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<td>BBS 5970</td>
<td>Introduction to Basic Biomedical Sciences Research</td>
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**Biochemistry and Molecular Biology Courses**

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<td>PPY 5120</td>
<td>Systems Physiology and Pharmacology I</td>
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<td>PPY 5130</td>
<td>Systems Physiology and Pharmacology II</td>
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<td>PPY 5140</td>
<td>Fundamentals of Effective Grant Construction</td>
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**Dissertation Research**

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<tr>
<td>PPY 6990</td>
<td>Dissertation Research (taken over multiple semesters)</td>
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**Total Credits**

42

**Non-Course Requirements**

Competency in statistics; knowledge of ethical conduct of research and rotation through research laboratories during the first year.

Credits in preparation for preliminary examinations total 36 minimum if degree pursued directly from the baccalaureate.

**Continuation Standards**

Students must maintain a cumulative grade point average (GPA) of 3.00 in all graduate/professional courses.