

# PHARMACOLOGY AND PHYSIOLOGY, PH.D.

Saint Louis University's Pharmacology and Physiology Ph.D. program in the Department of Pharmacology and Physiology (<https://www.slu.edu/medicine/medical-education/graduate-programs/pharmacology-physiology/>) 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 biochemistry, molecular biology, nuclear receptors, neuroscience, pharmacology and physiology.

## Program Highlights

- Major areas for research specialization include:
  - Pain Disorders and Therapeutics
  - Metabolic Disorders
  - Neuronal Diseases
  - Cardiovascular Control Mechanisms
  - Diabetes
  - Immune Cell Control
  - Medicinal Chemistry
- All formal coursework is scheduled during the morning hours, leaving the afternoons and evenings free for research. 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 R21 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 dissertation along with 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 pharmacology and physiology 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 work experience. In August of each year, newly admitted students start a year of didactic training in advanced topics in pharmacology and physiology.

## Curriculum Overview

Students who enter the pharmacology and physiology doctoral program take an additional six credit hours in advanced coursework (PPY-5110, Introduction to Pharmacology, -5120, Systems Physiology & Pharmacology I, -5130, Systems Physiology & Pharmacology II and -5140, Fundamentals of Grant Construction). Students also attend weekly seminar (PPY-6800) and journal club (PPY-6900) presentations. After completing the required coursework, the students assemble a Preliminary Proposal Defense Committee, write their Preliminary Examination

Proposal, and defend it before the end of February of their second year in the department.

Graduate Students in pharmacology and physiology will also have a unique opportunity to teach during training. The undergraduate course PPY 1450 (<https://catalog.slu.edu/search/?P=PPY%201450>) Drugs We Use and Abuse is administered and taught entirely by graduate students.

The course consists of 30 lectures per year, plus five discussion sessions. Typically, each graduate student in the program is responsible for three or four lectures on various 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 associated with the endocrine, cardiovascular and nervous systems. 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 levels.
- Understand how various drugs perturb these systems at both the cell level and the whole animal level.
- Discover and develop new chemical probes to investigate biological systems and therapeutics to treat disease states.
- Gain a better understanding of the pathophysiological mechanisms involved in disrupting cellular communications.

Strict attention is given to integrating advances made with simplified systems (genes, enzymes or receptors) 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 careers in academia, industry, medicine, or government.

## Admission Requirements

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

## Application Requirements

- Application form and fee
- Transcript(s)
- Three letters of recommendation
- GRE Scores
- Résumé
- Interview
- Professional goal statement

## Requirements for International Students

All admission policies and requirements for domestic students apply to international students. International students must also meet the following additional requirements:

- Demonstrate English Language Proficiency (<https://catalog.slu.edu/academic-policies/office-admission/undergraduate/english-language-proficiency/>)
- Financial documents are required to complete an application for admission and be reviewed for admission and merit scholarships.
- Proof of financial support that must include:
  - A letter of financial support from the person(s) or sponsoring agency funding the student's 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 the student's study at the University
- Academic records, in English translation, of students who have undertaken postsecondary studies outside the United States must include:
  - 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
  - Any honors or degrees received.

WES and ECE transcripts are accepted.

## Application Deadline

Students must submit an application to the Core Graduate Program by February 1.

## Review Process

The Core Graduate Program Admissions Committee examines and reviews the applicant and application wholly.

## Tuition

Tuition	Cost Per Credit
Graduate Tuition	\$1,310

Additional charges may apply. Other resources are listed below:

Net Price Calculator (<https://www.slu.edu/financial-aid/tuition-and-costs/calculator.php>)

Information on Tuition and Fees (<https://catalog.slu.edu/academic-policies/student-financial-services/tuition/>)

Miscellaneous Fees (<https://catalog.slu.edu/academic-policies/student-financial-services/fees/>)

Information on Summer Tuition (<https://catalog.slu.edu/academic-policies/student-financial-services/tuition-summer/>)

## Scholarships and Financial Aid

For priority consideration for graduate assistantship, apply by Feb. 1.

For more information, visit the student financial services office online at <https://www.slu.edu/financial-aid/index.php> (<https://www.slu.edu/financial-aid/>). (<https://www.slu.edu/financial-aid/>)

## Requirements

Code	Title	Credits
<b>Basic Biomedical Science Courses</b>		
BBS 5010	Basic Biomedical Science I	5

BBS 5020	Special Topics in Basic Biomedical Sciences I	4
BBS 5030	Basic Biomedical Science II	5
BBS 5040	Special Topics in Basic Biomedical Sciences II	4
BBS 5100	Ethics for Research Scientists	0
BBS 5920	Basic Biomedical Sciences Colloquium	2
BBS 5970	Introduction to Basic Biomedical Sciences Research	3
BCHM 6280	Intro to Genomics and Bioinformatics	2
<b>Pharmacology and Physiology Courses</b>		
PPY 5110	Introduction to Pharmacology	1
PPY 5120	Systems Physiology and Pharmacology I	2
PPY 5130	Systems Physiology and Pharmacology II	3
PPY 5140	Fundamentals of Effective Grant Construction	1
PPY 6800	Pharm & Phys Science Seminar	1
PPY 6900	Pharmacology and Physiological Science Journal Club	1
<b>Dissertation Research</b>		
PPY 6990	Dissertation Research (taken over multiple semesters, 12hrs total)	0-6
<b>Total Credits</b>		<b>46</b>

## 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.