

# PHARMACOLOGY AND TOXICOLOGY (PHD)

## Doctor of Philosophy in Pharmacology and Toxicology

Unit: School of Medicine (<http://louisville.edu/medicine/>) (GM)

Department: Pharmacology and Toxicology (<https://louisville.edu/medicine/departments/pharmacology/>)

Program Website (<https://louisville.edu/medicine/departments/pharmacology/programs/>)

Academic Plan Code(s): PHARPHD, PHARPHDCAI, PHARPHDJIL, PHARPHDWEN

## Program Information

The Department of Pharmacology and Toxicology is committed to academic excellence and to the attainment of regional, national, and international recognition for the quality of its educational, research, and service activities. The Department Strategic Plan focuses on accomplishment of five broad objectives:

-Provide instruction in pharmacology and toxicology of the highest quality for the education and preparation of medical, dental, and other health care professional students. Emphasis is placed on the fundamental principles necessary for life-long learning and the essential knowledge required for rational, effective, and safe use of drug therapy.

-Advance biomedical knowledge through high quality research and other scholarly activities, particularly in pharmacology and toxicology and other areas of focus within the University of Louisville and School of Medicine Strategic Plans.

-Provide robust research and educational experiences in pharmacology and toxicology for the education and training of future biomedical scientists who will provide and advance biomedical education, research, and service.

-Provide instruction of the highest quality in pharmacology and toxicology appropriate for students at the undergraduate, graduate, and postgraduate levels.

-Provide service to the School of Medicine, the Health Sciences Center, the University of Louisville and the surrounding region, the Commonwealth of Kentucky, professional organizations, the nation, and the world.

### Goals of the Program

The Department of Pharmacology and Toxicology is dedicated to advancing biomedical knowledge through active contribution to high-quality research in pharmacology and toxicology and to providing high-quality research and educational experiences for the education and training of future biomedical scientists who advance biomedical education, research, and service.

## Student Financial Support

Students accepted into the PhD program will be considered for an IPIBS graduate student fellowship. The fellowship pays an annual stipend of \$33,000 in addition to payment of student tuition and health insurance. The annual student stipend increases to \$35,000 upon achievement of PhD Candidacy. The Department also houses a NIEHS-funded T32 environmental health sciences training program (<https://louisville.edu/medicine/departments/pharmacology/research/program->

[description/](https://louisville.edu/medicine/departments/pharmacology/research/program-)) and participates in the NIEHS-funded Superfund Research Program (<http://louisville.edu/enviromeinstitute/superfund/>) , both provide stipend, tuition, and fees for selected students.

Since all PhD students and candidates are considered to be full-time students, they generally are not permitted to seek outside employment while enrolled in the doctoral program. In cases where financial aid is limited and additional support is essential, students needing outside employment must apply in writing for departmental faculty approval. The faculty must also approve any change in employment, as well as approving continued outside employment on an annual basis.

The University of Louisville reserves the right to change programs of study, academic requirements, fees, schedules of courses, the announced academic calendar and deadlines without prior notice.

## Admission Requirements

For the Department of Pharmacology and Toxicology complete guidelines are given below:

1. Application forms. All candidates for admission to graduate programs at the University of Louisville must complete the online application form (<https://graduate.louisville.edu/admission/apply/>).

Applications are accepted year-round for start dates around August

1. However, to receive full consideration for IPIBS fellowships, applications should be submitted by January 15 of the same calendar year. All credentials and/or communications should be submitted to the Graduate School, Graduate Admissions, and must include the applicant's full name and University of Louisville issued student ID (if available). In rare and special cases, provisional admission may be granted even if some application materials are incomplete. Please contact ([phtxapps@louisville.edu](mailto:phtxapps@louisville.edu)) the department for additional information.
2. Application Fee. An application will not be forwarded to the department until this fee is paid.
3. Transcripts. Applicants for admission to a degree program must submit an official transcript from each college attended. All University of Louisville transcripts will automatically be submitted with completion of an application. All applications are considered on an individual basis. Normally, a successful applicant will have an undergraduate GPA of 3.00 or higher and will have successfully completed sufficient coursework in biology, chemistry and mathematics.
4. Statement of Experience and Professional Goals. At the time of application, a 2-3 page typed statement should be sent to introduce the student to the faculty of the Department, describing past educational, laboratory and relevant life experiences, as well as outlining professional goals after the degree program. This statement can be sent electronically to [gradadm@louisville.edu](mailto:gradadm@louisville.edu).
5. English Proficiency. All applicants for whom English is a second language must also submit official TOEFL scores of 79 or higher on the internet-based test, official IELTS scores of at least 6.5 overall band score from the academic module exam or official Duolingo overall score of 105. Students holding a bachelor's or advanced degree from an accredited institution in the United States are exempt from this requirement. Information concerning the TOEFL exam can be obtained from: University Testing Center, or Test of English as a Foreign Language PO Box 6151 Princeton, NJ 08541 USA or [toefl.org](http://www.toefl.org) (<http://www.toefl.org>) The institutional code of UofL for TOEFL is 1838. The TOEFL department code

is 30 (other biological sciences); IELTS information can be obtained from [www.ielts.org](http://www.ielts.org) (<https://www.ielts.org/>); Duolingo information can be obtained from [englishtest.duolingo.com/](https://englishtest.duolingo.com/) applicants (<https://nam11.safelinks.protection.outlook.com/?url=http%3A%2F%2Fenglishtest.duolingo.com%2Fapplicants&data=04%7C01%7Ccheryl.schroader%40louisville.edu%7C0baa30a62e8345914a7c08d9faf80847%7Cdd246e4a54344e158ae35%7CTWFpbGZsb3d8eyJWljiMC4wLjAwMDAilCJQljoV2luMzliLjBTi6IklhbnwiLCJXV6IHRvPSJ0%3D%7C3000&sdata=touQ%2Brap6mVG4VBHkhRok5SfbyjKROnFk0yseS6clh8%3D&reserved=0>).

6. Personal Interview. Whenever possible, a personal interview, either in person or via Zoom, will be held before final offer and acceptance of a position in the PhD program.
7. Letters of Recommendation. Three letters of recommendation from persons familiar with the applicant's research and/or academic work are required.
8. International Student Applicants. In addition to meeting the required academic credentials and demonstrating English proficiency, the University of Louisville requires an international credential evaluation for all applicants who have attended colleges, universities, or postsecondary programs outside of the United States. Furthermore, upon admission, international students must provide evidence of sufficient financial resources to cover educational and living expenses throughout their studies. They must also submit a copy of their passport's biographical page as part of the I-20/DS-2019 process. For more details, visit the Graduate School website for international applicants (<https://graduate.louisville.edu/admission/international/>).
9. Financial Aid. All applicants to the PhD program of the Department of Pharmacology and Toxicology are automatically considered for financial aid upon admission. Typically, such aid consists of a stipend, tuition remission, and a health insurance benefit.

## Program Requirements

### Coursework

Year 1		
Fall		
		Hours
PHTX 641	Principles of Pharmacology	3
PHTX 643	Environmental Toxicology	3
BIOC 645	Advanced Biochemistry I	4
PHZB 602	Physiological Concepts for General Life Sciences	2
Co-curricular		
PHTX 617	Laboratory Rotation Research	1
PHTX 606	Seminar	1
<b>Hours</b>		<b>14</b>
Spring		
PHTX 642	Principles, Applications, and Research Methods in Pharmacology	3
PHTX 644	Organ Toxicology	3
BIOC 667	Cell Biology	3
BIOC 630	Responsible Conduct of Research: Survival Skills and Research Ethics	1
Co-Curricular		
PHTX 619	Research	1
PHTX 606	Seminar	1
<b>Hours</b>		<b>11</b>
Summer		
PHTX 632	Analysis of Parametric & Non-parametric Data	2

PHTX 619	Research	4
<b>Hours</b>		<b>6</b>
Year 2		
Fall		
PHTX 625	Scientific Writing	2
Students may take 1-3 elective courses for enrichment		1-8
Co-curricular		
PHTX 619	Research	4
PHTX 606	Seminar	1
<b>Hours</b>		<b>8</b>
Spring		
Students may take 1-3 elective courses for enrichment (Master's Candidacy)		1-9
Co-curricular		
Submission, presentation, and defense of PhD proposal (NIH grant format) and MS thesis.		
Awarding of MS degree and transition to PhD candidacy.		
<b>Hours</b>		<b>1</b>
<b>Minimum Total Hours</b>		<b>40</b>

### Advisor Selection and Ph.D. Dissertation Committee Formation

During orientation week, all incoming students will meet with primary and secondary faculty members from the Department of Pharmacology and Toxicology who have openings in their laboratories to discuss potential research projects. Students are encouraged to select two or more laboratories for research rotations to explore different research environments. Students are expected to select a Dissertation Research Advisor by the end of the spring term of their first year, and no later than the end of the summer term of the same year. Faculty must hold Graduate Research Training Faculty status to serve as a sole advisor.

The Ph.D. dissertation committee must consist of at least five qualified members, including the Advisor. All committee members must hold Graduate Faculty or Graduate Research Training Faculty status. The committee must include at least one primary faculty member from the Department of Pharmacology and Toxicology and at least one member from outside the department. The selection of the Research Advisor and the formation of the dissertation committee require approval from the Director of Graduate Studies, the Department Chair, and the Associate Dean for Graduate and Postdoctoral Studies in the School of Medicine.

### Minimum Program Requirements

Ph.D. students enrolled in the Pharmacology and Toxicology graduate program must complete an M.S. degree and successfully defend their Ph.D. proposal to advance to doctoral candidacy. Students are expected to achieve doctoral candidacy within three years of entering the program. To be eligible for candidacy, students must complete a minimum of 40 credit hours by the end of their second year. Coursework older than six years, including transfer credits, will not count toward the M.S. degree or Ph.D. candidacy.

To maintain good standing and complete the Ph.D. degree, students must:

1. Successfully complete all coursework with a minimum GPA of 3.0, with no grades of C or below.
2. Complete required laboratory rotation(s).
3. Deliver an annual seminar presentation.
4. Pass written qualifying examinations.
5. Complete a master's thesis, including both written and oral defense.

6. Write a PhD proposal (serving as the written qualifying exam).
7. Pass the oral qualifying exam, which includes the presentation and defense of the PhD proposal.
8. Hold annual dissertation committee meetings with proper documentation.
9. Submit annual progress reports, including an updated Individual Development Plan (IDP).
10. Regularly attend weekly departmental seminars.

To fulfill all PhD degree requirements, students:

1. Are encouraged to publish at least one first-author manuscript or make equivalent scientific contributions.
2. Must write and publicly defend a doctoral dissertation that meets the standards of the dissertation committee and the Graduate School.

## Qualifying Exam

PhD students must pass both written and oral qualifying exams to advance to doctoral candidacy. The written exam requires the preparation of a PhD dissertation proposal formatted as an NIH grant proposal, though alternative formats may be accepted if intended for submission to a different funding agency. The proposal typically includes an abstract, a biosketch, a budget and justification, specific aims, a research strategy outlining background, significance, innovation, and approaches, along with a list of cited literature. The oral exam involves presenting and defending the dissertation proposal. The research proposal must be submitted to the dissertation committee and department faculty at least two weeks before the scheduled exams. Additionally, an external reviewer with expertise in the field, selected by the student and approved by the PhD Qualifying Exam Committee, serves as an external examiner. Each committee member and the external examiner provide scores and a written critique, which are shared with the student to guide revisions and support extramural funding submissions. The PhD student must revise the dissertation proposal in response to the critiques. The majority opinion of the dissertation committee determines the final assessment of the student's performance on both the written and oral components of the qualifying exams.