

# Doctoral Program in Pharmacology & Toxicology

## Program Overview

The Doctor of Philosophy (Ph.D.) degree, which requires approximately five years of training, consists of coursework in the basic principles of pharmacology and toxicology and training in research and the scientific method.

It is important to the department faculty that each student has the opportunity to reach their individual potential by pursuing the research that is the most interesting to the student as an individual.

The doctoral program provides:

- Knowledge, insight and skills needed to make significant contributions as independent scientists, as well as to achieve prominent roles in academia, government, and industry.
- A learning environment that is nurturing, intellectually challenging, and personally rewarding.
- An enthusiastic, knowledgeable, and diverse faculty, who have made significant contributions in their fields of expertise.
- Modern, state-of-the-art facilities that support a wide range of research interests and valuable hands-on research experiences.
- Career development and enrichment activities to prepare each student for a wide array of possible careers.

## Student Research

Research is conducted under the direction of a faculty mentor, who provides the resources required for a dissertation project. Students will also be supported by a guidance committee composed of departmental and other faculty.

Students are required to complete an original dissertation. Students also have opportunities to travel to national and international scientific conferences where they can present their work and begin to develop a network of professional colleagues.

## Admissions

Applicants enter the Pharmacology & Toxicology Ph.D. program through the Biomolecular Science Gateway Program.

After admission, students conduct 3 or 4 rotations during their first year where they have the ability to work with multiple PIs and experience different laboratory opportunities. In the late spring, students select their permanent lab and major.

For more information about how to apply and admission requirements, email [bmsgrad@msu.edu](mailto:bmsgrad@msu.edu). Or visit the BMS Webpage

## Program Director



**Dr. Anne Dorrance**  
*University of Glasgow,  
Scotland*  
Associate Chair &  
Graduate Program Director  
[dorranc3@msu.edu](mailto:dorranc3@msu.edu)

Her research focuses on the effects of hypertension and obesity on the cerebral vasculature. In particular, she is interested in understanding how changes in artery structure and function increase the risk of stroke and dementia development.

## For Questions, Contact



**Jake Wier**  
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# Doctoral Program in Pharmacology & Toxicology

## Program Requirements

### Required Courses:

- **PHM 801:** Fundamental Principles of Pharmacology & Toxicology
- **PHM 802:** Integrated Systems Pharmacology
- **PHM 816:** Integrative Toxicology: Mechanisms, Pathology and Regulation
- **PHM 830:** Experimental Design and Data Analysis

### One of the Following:

- **BMB 801:** Molecular Biology
- **BMB 802:** Metabolic Regulation, Signal and Transduction One of the Following:

### One of the Following:

- **PSL 828:** Cellular and Integrative Physiology I
- **PSL 829:** Cellular and Integrative Physiology II

### Additional Requirements:

- **PHM 910:** Seminar Discussions of Current Topics
- **PHM 999:** Doctoral Dissertation Research

### Other Program Requirements:

- Completion of the Graduate School Responsible Conduct of Research (RCR) Seminar Series
- Attendance at Graduate Student Forums
- Presentation of three research seminars over graduate career: (1) research rotation, (2) thesis proposal, and (3) dissertation defense seminar
- Participation in the department journal club /chalk talk program
- Participation in student teaching

## Interdisciplinary Training

### The Environmental and Integrative Toxicological Sciences Program (EITS)

Students admitted to the Pharmacology and Toxicology PhD program who are interested in toxicology, and research related to the harmful health effects of chemicals, can enroll in the multidisciplinary dual-major graduate program in Environmental and Integrative Toxicological Sciences (EITS).

The EITS program is administered through MSU's Institute for Integrative Toxicology and offers outstanding training in basic biomedical science couple with training and credentials that can open additional career opportunities.

### The Integrative Pharmacological Sciences Training Program (IPSTP)

The IPSTP is an interdisciplinary training program, facilitated by the Pharmacology and Toxicology Department, available to Ph.D. students in seven Ph.D. programs: Pharmacology & Toxicology, Biochemistry & Molecular Biology, Chemistry, Chemical Engineering and Material Science, Microbiology and Molecular Genetics, Neuroscience, and Physiology. Students will focus on study in two unique areas of research, in vivo pharmacology approaches and drug discovery.

This program provides two years of stipend and tuition support to select trainees. Travel and enrichment funds are also available to trainees.