

# PHARMACOLOGY, PHD

The Department of Pharmacology and Molecular Sciences hosts the Pharmacology Graduate Program, which offers a program of study and research leading to the Ph.D. degree. Research training opportunities within the program cover a broad spectrum of biomedical sciences including chemical biology, immunology, virology, cancer, and neuroscience. The mission of departmental research is to understand the molecular processes underlying physiology and pathology, and to apply this knowledge to discovering new drug targets and developing novel therapeutics. Within the program, students may choose to focus their efforts in any of a large number of specific research areas including signal transduction, structural biology and drug design, NMR spectroscopy, molecular genetics, cancer chemoprevention, viral immunosuppression, cancer immunology, cell-mediated immunity, mechanisms of HIV infection, vaccine development, glycobiology, biomedical mass spectrometry, clinical pharmacology, drug delivery, anti-parasite drug development, histone acetylation and gene regulation, melatonin and circadian rhythm, drug metabolism, Vitamin D pharmacology, natural product biosynthesis, telomerase and chromosome stability, T cell activation and tolerance, DNA repair, DNA topoisomerases, molecular imaging, and the clinical pharmacology of cardiovascular agents. The department is also pleased to host students and award doctoral degrees to M.D./Ph.D. degree candidates and students in other Ph.D. graduate programs in which Pharmacology faculty participate (Biochemistry, Cellular and Molecular Biology, Cellular and Molecular Medicine, Immunology, Neuroscience, and Pathobiology).

## Financial Support

Financial support covering normal living costs, individual medical insurance, and tuition is usually provided.

## Admission Requirements

Applicants should have a B.A. or B.S. degree with a major in any of the biological or physical sciences. Entering students are expected to have completed college-level courses in chemistry (inorganic, organic, and physical), calculus, and physics; a strong background in biochemistry is particularly desirable. A completed application form, at least three letters of recommendation, undergraduate transcripts, and a statement of interest must be received by December 8th.

## Program Requirements

Students in the Pharmacology program are able to select a course of studies uniquely suited to their own career goals. It is usually required that students successfully complete the following courses:

- Macromolecular Structure and Analysis
- Biochemical and Biophysical Principles
- Molecular Biology and Genomics
- Cell Structure and Dynamics
- Organic Mechanisms in Biology
- Pathways and Regulation
- Bioinformatics
- Primary Source Readings and Analysis
- Organ Physiology
- Graduate Pharmacology I & II
- Essential Grantsmanship: Writing the Research Proposal

Students must also take two advanced elective courses selected from those offered by this or other departments.

During their first year of study, students will complete ~10-week research rotations in addition to their coursework. They will initiate dissertation research by the end of their first year and complete elective courses relevant to their developing interests in subsequent years of training.

During the second year of study, students will be required to pass a qualifying examination conducted as prescribed by the Doctor of Philosophy Board of the University. This examination will probe the depth and breadth of the student's knowledge of the biomedical subjects taught in the core courses.

The candidate is required to present a written dissertation based on original research undertaken while in residence as a graduate student and to present a departmental seminar describing the thesis research.

## Combined M.D.-Ph.D. Degrees

Students seeking admission to or who are already participating in the M.D. program in the School of Medicine may participate in a program leading to both the M.D. and the Ph.D. degrees.