

# PhD in Medical Pharmacology and Physiology

## Degree Requirements

The PhD requires satisfactory completion of at least 72 credit hours of coursework and defense of dissertation. This includes at least two years of basic and advanced courses in physiology and/or pharmacology, as well as courses in cell and molecular biology. Included in course requirements is a minimum of 15 hours of 8000-9000 level courses, not including research courses (8090 or 9090). Students will also be trained in conducting physiological and pharmacological research in the laboratory of individual faculty members during the first year, including three 4-week laboratory rotations before the end of the first semester. The student will choose a dissertation mentor at or before the end of the first year and decide whether they wish to pursue the doctoral program in Pharmacology or Physiology. PhD students must serve as a teaching assistant for at least two semesters. Students are also required to present at the annual departmental student research update day each year that they are enrolled in the program. The doctoral program normally requires four to five years beyond the baccalaureate degree.

### Required Courses

STAT 7070	Statistical Methods for Research	3
or STAT 7530	Analysis of Variance	
or STAT 7510	Applied Statistical Models I	
MPP 7422	Medical Physiology	4
MPP 7424	Medical Pharmacology	4
MPP 8412	Seminar in Medical Pharmacology and Physiology (every semester)	1
MPP 8415	Responsible Conduct of Research thru Engagement, Enactment and Empowerment NIH and other Federal Age	2
MPP 8420	Skills in Biomedical Research	2
MPP 9422	Medical Pharmacology and Physiology Journal Club (every semester)	1
MPP 9426	Transmembrane Signaling	4
BIOCHM 7270	Biochemistry	3
BIOCHM 7272	Biochemistry	3

### Electives (must choose at least two)

MPP 9437	Neural Control of the Circulation	3
MPP 9430	Cardiovascular Physiology	3
MPP 9431	Control of Energy Metabolism	3
MPP 9432	Mammalian Membrane Physiology	1-3
MPP 9434	Microvascular Circulatory Function	4
MPP 9435	Molecular Exercise Biology	1-3
V_BSCI 8420	Veterinary Physiology	5
V_BSCI 5100	Veterinary Neuroscience	2

## Qualifying Examination Policy

The department does not require a formal qualifying examination. Successful completion of the core curriculum and satisfactory

performance in conducting scientific research and teaching will qualify students for continuation in the PhD program.

## Comprehensive Examination

All PhD program students must pass a comprehensive examination before the end of the first semester of the third year of enrollment. The usual format of the comprehensive exam includes the writing and oral defense of a research proposal outside of the student's dissertation research area.

## Dissertation

Each student must then carry out a dissertation research project, original in nature, which is expected to contribute significant new knowledge to the area of study. To facilitate this process, each student submits a dissertation research proposal within six months of passing the comprehensive examination.

## Oral Defense

Finally, all PhD candidates must pass an oral defense of the dissertation and comply with all university and departmental regulations governing the PhD degree.

## Admissions

### Application Deadlines

Fall deadline: December 15

### Admission Criteria

- Minimum GPA: 3.0 in the last 60 hours
- Bachelor's degree from an accredited college
- Background in biology and chemistry and an understanding of mathematics and physics
- Course work in biochemistry and physiology is highly recommended
- Previous lab or research experience preferred
- Minimum English proficiency scores, one of the following (International applicants only):
  - TOEFL Test Of English as Foreign Language (internet based) = 80
  - IELTS International English Language Testing System (overall academic score) = 6.5
  - PTE Pearson Test of English = 59
  - C1A Cambridge C1Advanced = 180
  - Duolingo English Test = 105

Students are usually admitted to begin their program in the Fall semester. Women and minorities are encouraged to apply.

Students with an appropriate educational background are encouraged to apply for entrance into the PhD program. A master's degree is not a prerequisite for admission to the doctoral program. Deficiencies in course work may be remedied during the first years of the graduate program.

An application submitted through the University of Missouri Graduate School. The application will include the following:

1. Copies or official copies of transcripts from all colleges and universities attended.
2. Three letters of recommendation - written by individuals with knowledge of the student's academic capability

3. Statement of Purpose - Provide in 400 words or less a brief description of research experience (abstract and paper citations preferred) and a statement of how the (M.S./Ph.D.) program will facilitate your career goals.
4. International students must submit copies or official copies of English proficiency test scores from either the TOEFL, IELTS, PTE, Cambridge C1 Advanced, or Duolingo examinations. MU's minimum test scores are:
  - TOEFL 80 (internet-based)
  - IELTS 6.5 (academic)
  - PTE 59
  - Cambridge C1 Advanced 180
  - Duolingo 105

**Admission Contact Information**

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