Pharmaceutical and Pharmacological Sciences, Ph.D.

Degree Offered

- Doctor of Philosophy

The Pharmaceutical and Pharmacological Sciences Graduate Program is housed in the School of Pharmacy and associated with the Department of Pharmaceutical Sciences. The program is one of the Ph.D. degree-granting programs in Biomedical Sciences at the WVU Health Sciences Center (HSC).

The Pharmaceutical and Pharmacological Sciences Graduate Program at West Virginia University is an interdisciplinary program that prepares students for a future in a variety of employment settings, ranging from academic research and industry to federal positions. Our students have a unique and rich training environment, which gives them a basis in such pharmaceutical sciences disciplines as drug development and discovery, pharmaceutics, pharmacology, toxicology, therapeutic development and regulatory affairs. Students can take additional graduate courses in drug delivery systems, drug metabolism, molecular modeling, bench to bedside and biotechnology.

The core areas of Ph.D. training in Pharmaceutical and Pharmacological Sciences are:

1. pharmacology and therapeutic development,
2. drug delivery, and,
3. drug discovery and biotechnology.

The students are mentored by experts with an international reputation and publish in prestigious journals. They also have opportunities to present their research at national and international scientific meetings and to enroll in internships with pharmaceutical or biotech companies.

Upon completion of the second year of study, students must submit a formal plan of study and a research plan that is approved by their Ph.D. committee. Progress is expected to continue with guidance from the student's research committee. Final admission to candidacy requires satisfactory performance on written and oral qualifying examinations, including a dissertation proposal defense. Subsequent to admission to candidacy, a substantial part of the program is devoted to an original research project which culminates in a first-authored publication and dissertation. To be recommended for a Ph.D., the dissertation must be satisfactorily completed and defended at an oral examination. Typically, four to five years are needed to graduate.

Academic Standards

No credits are acceptable toward a graduate degree with a grade lower than a C. A graduate student is expected to have a cumulative grade point average of at least 3.0 in all graduate courses to continue in the program and to qualify for a Ph.D. degree.

Introduction

The WVU School of Pharmacy offers graduate programs in the pharmaceutical and pharmacological sciences for the Ph.D. degree. The school is advantageously located in the Health Sciences Center complex which also houses all departments of the Schools of Medicine, Nursing, and Dentistry, as well as a comprehensive medical library, audio-visual and computer-based learning center, research core facilities, and laboratory animal quarters. State-of-the-art research laboratories are located throughout the Health Sciences Center complex to facilitate interactions with the Mary Babb Randolph Cancer Center, Center for Neuroscience, and Center for Cardiovascular and Respiratory Sciences. In addition, the Health Sciences Center has easy access to the Evansdale and Downtown campuses of WVU through a personal rapid transit (PRT) system. The scientific community, which is especially well-developed, draws on area scientists throughout WVU, the Centers of Disease Control/National Institute on Occupational Safety and Health (CDC/NIOSH), Federal Bureau of Investigation (FBI), and a variety of research centers supported by the National Institutes of Health (NIH), National Science Foundation (NSF), and the Department of Energy (DOE). A CDC/NIOSH research facility is two blocks away, and Mylan Pharmaceuticals, a leading generic drug producer in the world, is located across the street from the Health Sciences Center. In addition, the school has long-standing collaborations with several state agencies and multinational pharmaceutical companies.

ADMINISTRATION

CHAIR

- Paul Lockman - PhD

GRADUATE PROGRAM DIRECTORS

- Werner Geldenhuys - PhD
- Ahmad Hanif - Ph.D.

Admissions for 2026-2027

Applicants for admission into the graduate program must satisfy the WVU and Health Sciences Center general requirements for admission as a graduate student. Applicants interested in this program must apply through a common admissions portal. Choice of this graduate program occurs during the first year of graduate study after selection of an advisor for your dissertation research. Applications include a personal statement, unofficial transcripts from all Colleges or Universities attended, and 3 letters of recommendation. Admitted applicants must arrange to have official copies of transcripts sent directly to the WVU Office of Graduate Admissions and Recruitment. Competitive applicants have a STEM GPA of 3.5 or higher and possess a baccalaureate degree that provides sufficient scientific background the basic sciences. Note that the graduate record exam (GRE) is not required and will not be considered in evaluating applications. International applicants must satisfy English Language Proficiency requirements as established by WVU International Admissions (https://graduateadmissions.wvu.edu/information-for/international-students/).

To review the application process, please visit: https://health.wvu.edu/research-and-graduate-education/graduate-education/phd-programs/biomedical-sciences/admissions/

To obtain specific information related to the school's graduate programs, graduate faculty research interests, and availability of graduate assistantships or fellowships, applicants may contact program directors.

Graduate Directors:
Werner J. Geldenhuys, B.Pharm., Ph.D.
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Major Code: 8975

Doctor of Philosophy

The School of Pharmacy offers a doctor of philosophy (Ph.D.) degree in pharmaceutical and pharmacological sciences aimed at training competent researchers and educators.

MAJOR REQUIREMENTS

Code	Title	Hours
BMS 700	Scientific Integrity	1
BMS 701	Scientific Rigor and Ethics	1
BMS 702	Biomedical Lab Experience	2
BMS 706	Biomedical Research Methods	1
BMS 707	Experiential Learning for Biomedical Trainees	2
BMS 720	Scientific Writing	2
BMS 747	Foundations for Contemporary Biomedical Research I	4
BMS 777	Foundations for Contemporary Biomedical Research 2	4
PHAR 779	Drug Discovery	3
PHAR 706	Biopharmaceutics	2
PHAR 805	Drug Chemistry	2
PHAR 809	Principles of Drug Action	2
PHAR 816	Pharmacokinetics	2
Graduate Seminar		7
PHAR 796	Graduate Seminar	
Research		42-44
PHAR 797	Research	
Journal Clubs (Select from the following)		7
PHAR 773	Recent Research Advancement in Cardiology Journal Club	
PHAR 782	Tumors of the Central Nervous System Journal Club	
PHAR 784	Pharmacology Journal Club	
PHAR 787	Drug Discovery and Development	
Advanced Courses/Electives*		4-8

PHAR 780	Introduction to Molecular Modeling
PHAR 781	Drug Metabolism
PHAR 793	Special Topics
PHAR 803	Physical Pharmacy
PHAR 804	Drug Delivery Systems
PHAR 806	Pharmaceutical Biotechnology
PHAR 808	Pharmacogenomics
Qualifying Exams	
Dissertation Proposal Defense	
Dissertation Defense	
*Note: Other graduate courses at WVU may be taken as an elective with the permission of the student's advisory committee.	
Total Hours	90-92

PHARMACEUTICAL AND PHARMACOLOGICAL SCIENCES PATHWAY SUGGESTED PLAN OF STUDY

First Year

Fall	Hours	Spring	Hours	Summer	Hours
BMS 700	1	BMS 701	1	PHAR 797	3
BMS 706	1	PHAR 797	1		
BMS 702	2	PHAR 796	1		
BMS 747	4	Journal Club (select from the following)	1		
BMS 777		PHAR 773			
		PHAR 782			
		PHAR 784			
		PHAR 787			
		PHAR 706	2		
		PHAR 805	2		
		PHAR 809	2		
		PHAR 816	2		
	12		12		3

Second Year

Fall	Hours	Spring	Hours	Summer	Hours
PHAR 779	3	Advanced Courses/ Elective Modules (select from list)	2-3	PHAR 797	1
Advanced Courses/ Elective Modules (Select from the list)	2-5	PHAR 796	1	BMS 720	2
PHAR 796	1	Journal Club (Select from the following)	1		
Journal Club (Select from the following)	1	PHAR 773			
PHAR 773		PHAR 782			
PHAR 782		PHAR 784			
PHAR 784		PHAR 787			
PHAR 787		PHAR 797	4-5		
PHAR 797	1-2	Take Qualifying Exams			
* Students must sign up for a minimum of 9 credit hours.		* Students must sign up for a minimum of 9 credit hours.			
	9-11		9		3

Third Year

Fall	Hours	Spring	Hours	Summer	Hours	
PHAR 796		1 PHAR 796		1 PHAR 797		1
Journal Club (Select from the following)		1 Journal Club (Select from the following)		1 BMS 707		2
PHAR 773		PHAR 773				
PHAR 782		PHAR 782				
PHAR 784		PHAR 784				
PHAR 787		PHAR 787				
PHAR 797		7 PHAR 797		7		
Proposal Defense		*Students must sign up for a minimum of 9 hours				
*Students must sign up for a minimum of 9 hours						
		9		9		3

Fourth Year

Fall	Hours	Spring	Hours	Summer	Hours	
PHAR 797		7 PHAR 797		7 PHAR 797		3
PHAR 796		1 PHAR 796		1		
Journal Club (Select from the following)		1 Journal Club (Select from the following)		1		
PHAR 773		PHAR 773				
PHAR 782		PHAR 782				
PHAR 784		PHAR 784				
PHAR 787		PHAR 787				
*Students must sign up for a minimum of 9 hours.		*Students must sign up for a minimum of 9 hours				
		9		9		3

Total credit hours: 90-92

Major Learning Outcomes

DOCTOR OF PHILOSOPHY (PHD)

Student Learning Outcomes of the Pharmaceutical & Pharmacological Sciences graduate education program are focused on preparing students to become independent researchers. To be successful in our program pathways, students will need to develop competencies in the scientific research process through didactic studies in an area of emphasis and then conceptualizing, designing, conducting, and reporting original research.

Student Learning Outcomes

1. Demonstrate competency in the 6 content areas of pharmaceutical and pharmacological sciences:
   a. Drug Chemistry
   b. Pharmacokinetics
   c. Principles of Drug Action
   d. Approaches to Drug Discovery
   e. Biopharmaceutics
   f. Pharmacology
2. Independently design experimental protocols that include the principles of rigor and reproducibility, conduct the experiments, analyze the results, and defend the experimental approach to other scientists.
3. Develop and plan the test of hypotheses regarding significant problems in the student’s chosen area of specialization
4. Demonstrate critical thinking/problem solving ability by effectively criticizing the relevant literature and by asking relevant questions in seminars.
5. Ability to effectively reference the relevant literature in support of the student's research project. Ability to identify significant gaps in knowledge on this scientific topic.

6. Effectively communicate scientific information in written abstracts for research presentations, manuscripts for publication, research grant proposals, and the dissertation.
7. Effectively communicate scientific information in both formal and informal oral presentations.