PHYSIOLOGY AND BIOPHYSICS, PHD

Degree: Doctor of Philosophy (PhD)
Field of Study: Physiology and Biophysics

Admissions

Students are admitted to this PhD program through the Biomedical Sciences Training Program (BSTP) or the Medical Scientist Training Program (MSTP).

Biomedical Sciences Training Program (BSTP)

The BSTP offers a common entry point to most of the School of Medicine's biomedical PhD programs. BSTP students can choose among research mentors in many different PhD programs in the School of Medicine.

Medical Scientist Training Program (MSTP)

Students in the MSTP earn the dual MD/PhD degree. MSTP students also have the choice of mentors in many different PhD programs. The admission requirements of those programs can be viewed on their pages in the Bulletin. Program requirements for the dual can be found on the Medical Scientist Training Program, PhD/Medicine, MD program page.

PhD Policies

For PhD policies and procedures, please review the School of Graduate Studies section of the General Bulletin.

Program Requirements

To earn a PhD in Physiology and Biophysics, a student must complete rotations in at least three laboratories followed by selection of a research advisor, and complete Core and Elective coursework including responsible conduct of research as described in the course of study, below. Students who previously completed relevant coursework, for example with an MS, may petition to complete alternative courses. Each graduate program follows the overall regulations established and described in CWRU Graduate Studies and documented to the Regents of the State of Ohio. Completion of the PhD degree will require 36 hours of coursework (24 hours of which are graded) and 18 hours of PHOL 701.

In addition, each student must successfully complete a qualifier examination for advancement to candidacy in the form of a short grant proposal with oral defense. The qualifier is generally completed in the summer after year two. During the dissertation period, students are expected to meet twice a year with the thesis committee, present seminars in the department, and fulfill journal publication requirements. At the completion of the program, successful defense of a doctoral dissertation is required. Throughout the doctoral training, students are expected to be enthusiastic participants in seminars, journal clubs, and research meetings in the lab and program.

Biomedical Sciences Training Program (BSTP) Requirements

Coursework

Students take integrated courses in Cell and Molecular Biology (IBMS 453, IBMS 455). They also complete a course in biostatistics (IBMS 450) and a literature based reading course (IBMS 456A). These four courses, offered in the fall semester, emphasize the molecular approaches that form the basis of modern biology. We also seek students with strong quantitative training who may have majored in physics or math, and offer alternative courses for these students to acquire foundations in biology. Qualified students also may take more specialized elective courses. All students take IBMS 500 On Being a Professional Scientist: The Responsible Conduct of Research.

Research Rotations

The research rotations allow students to explore research areas and become familiar with faculty members and their laboratories. The main purpose of these rotations is to aid students in selecting a laboratory for their thesis work. Students are encouraged to begin their rotations in July. Doing so gives them the opportunity to complete rotations during the summer before classes begin at the end of August. Students must complete at least three rotations.

Choosing a Thesis Advisor

During the first year, students select an advisor for their dissertation research. Each student also joins the PhD program with which their advisor is affiliated. Once students choose a PhD program, the requirements of that program are followed to obtain the PhD. The emphasis of the PhD work is on research, culminating in the completion of an original, independent research thesis and publishing the results in the scientific literature. PhD programs also focus on educating students to work as professional scientists.

Sample Plan of Study

First Year

Fall		**Hours**
IBMS 453	Cell Biology I	3
IBMS 455	Molecular Biology I	3
Select one of the following:		1
IBMS 456A	Since You Were Born: Nobel Prize Biomedical Research in the Last 21 Years- Section A	
IBMS 456B	Since You Were Born: Nobel Prize Biomedical Research in the Last 21 Years- Section B	
IBMS 456C	Since You Were Born: Nobel Prize Biomedical Research in the Last 21 Years- Section C	
IBMS 456D	Since You Were Born: Nobel Prize Biomedical Research in the Last 21 Years- Section D	
Select one of the following:		0-9
BSTP 400	Research Rotation in Biomedical Sciences Training Program	
MSTP 400	Research Rotation in Medical Scientist Training Program	
PHOL 505	Laboratory Research Rotation	

IBMS 450	Fundamental Biostatistics to Enhance Research Rigor & Reproducibility	1
Elective 1		
	Hours	**8-17**
Spring		
IBMS 500	On Being a Professional Scientist: The Responsible Conduct of Research	1
PHOL 601	Research	1 - 18
PHOL 498B	Physiology Seminar B (Spring Semester)	1
PHOL 401A	Physiology and Biophysics of Molecules and Cells	2
PHOL 401B	Physiology and Biophysics of Molecules and Cells	2
Elective 2		
Elective 3		
	Hours	**7-24**
Second Year		
Fall		
PHOL 498A	Physiology and Biophysics Departmental Seminar	1
PHOL 601	Research	1 - 9
PHOL 401C	Human Physiology: A Molecular Understanding of Organ System Function	2
Elective 4		
Elective 5		
	Hours	**4-12**
Spring		
PHOL 498B	Physiology Seminar B (Spring Semester)	1
PHOL 601	Research	1 - 9
	Hours	**2-10**
Third Year		
Fall		
PHOL 701	Dissertation Ph.D.	1 - 9
PHOL 498A	Physiology and Biophysics Departmental Seminar	1
	Hours	**2-10**
Spring		
PHOL 701	Dissertation Ph.D.	1 - 9
PHOL 498B	Physiology Seminar B (Spring Semester)	1
	Hours	**2-10**
	Total Hours	**25-83**

* After passing qualifying exam - full-time thesis research (701) - 18 total credit hours total
* IBMS 501 is offered every spring semester (beginning 2020). The SOM requires that PhD students who are 4 years beyond their initial RCR training in IBMS 500, register for IBMS 501.