

# Immunology, PhD

## Degree Requirements

### Immunology

The Immunology program is a graduate training program at WashU, housed under the Roy and Diana Vagelos Division of Biology and Biomedical Sciences (DBBS).

Immunology is the discipline of biology that examines the mechanisms of host defense against pathogenic agents. The study of the immune system offers a unique opportunity to analyze a complex multicomponent system consisting of molecules and cells that have documented physiologic relevance. Immunology has a strong foundation in biochemistry, molecular biology, and cell biology.

We recognized our program as a top program in the nation and we aim to retain that standing, along with our reputation for rigor and high standards. Supporting and promoting student wellness, success, and resilience is at the center of this goal. The primary objective of the program is to provide our students with a solid foundation of skills as a scientist overall and specifically in the conduct of immunology research. The program aims to achieve this by providing formal educational training to our students, while also incorporating our students in semi-formal and informal settings, incorporating them in all that we do as faculty to sharpen our own skills and keep abreast of our fields. We provide opportunities for our students to interact weekly with each other as they present annual progress talks on their research, and we aim for high levels of participation by affiliated faculty at these events. In addition, we provide weekly opportunities to meet with and host outside immunology speakers in our seminar series. We set up these opportunities so that our students regularly interact with other immunologists at a variety of career stages, including postdocs and junior faculty.

Washington University School of Medicine has a large community of investigators who make immunology their primary focus. The research within our program spans a broad spectrum, ranging from studies at the basic structural and molecular levels of host defense all the way to clinical applications directed at significant health problems, such as cancer immunotherapy. The program in Immunology has grown to include more than 100 research laboratories and continues to increase. This unusual concentration of immunologists was the stimulus that led to the founding of the Immunology graduate program in 1986.

To earn a PhD at within the Roy and Diana Vagelos Division of Biology and Biomedical Sciences at Washington University, a student must complete all courses required by their department; maintain satisfactory academic progress; pass the qualifying examination; complete all requirements for doctoral candidacy; create a Research Advisory Committee (RAC); submit a Title, Scope, and Procedure Form; fulfill residence and Mentored Experience Requirements; write, defend, and submit a dissertation; and apply for program completion (graduation) via Workday Student.

## Program Requirements

- **Total Units Required:** 36 units
- **Degree Length:** Seven years
  - Students are expected to maintain satisfactory academic progress in accordance with academic milestones. Students entering their seventh year in the program will receive a warning letter in regards to reaching their stated degree length. Students entering their eighth year in the program will be required to obtain permission from the Associate Dean of Graduate Education. Across DBBS programs, the average time to degree is 5.6 years.
- **Note:** Students must be enrolled in 9 graduate credits each semester to retain full-time status. As students complete their coursework, if enrolled in fewer than 9 graduate credits, they must enroll in a specific Biology & Biomedical Sciences research graduate course to maintain full-time status. Prior to completing 36 credit units, student will enroll in BBS 5900 Research for research credit; after completing 36 credit units, students will enroll in BBS 9000 Full-Time Graduate Research/Study, which will show 0 credit units but fulfills full-time status. Students should follow advising instructions to ensure proper enrollment prior to Add/Drop.
- Continued support is guaranteed for the duration of the student's graduate studies, provided that the student maintains satisfactory progress toward completion of the degree.
- **Grade Requirement:** Required courses generally consist of four to nine courses in areas fundamental to the student's program. Students are expected to maintain a B average in graduate courses.

## Required Courses

### DBBS Required Courses

- BBS 5098 Graduate Research Fundamentals
- BBS 5011 Ethics & Research Science

### Program Required Courses

- BBS 5053 Immunobiology I
- BBS 5272 Advanced Topics in Immunology
- BBS 5054 Immunobiology II

### One 3-Credit Advanced Elective (or equivalent)

Examples of common elective choices include the following:

- BBS 5068 Fundamentals of Molecular Cell Biology
- BBS 5392 Molecular Microbiology & Pathogenesis
- BBS 5312 Macromolecular Interactions
- BBS 5325 Protein Structure and Function



- BBS 5352 Developmental Biology
- BBS 5384 Advanced Cell Biology/Biochemistry of Membranes
- BBS 5480 Nucleic Acids & Protein Biosynthesis
- BBS 5910 Nano Topics in Biology and Biomedical Sciences

## Laboratory Rotations

Selecting a thesis advisor is the most important decision a student makes in graduate school. To help each student make an informed, thoughtful choice, the Division builds in flexibility to explore options. Students usually participate in three lab rotations during their first year. Additional rotations can be arranged, and rotation lengths are flexible. Students usually begin their thesis research by the end of their first year.

## Scientific Scholarship

Keeping abreast of scientific developments is critical for faculty and students alike. The Division offers many ways to stay current. More than 15 weekly biology seminars provide excellent opportunities to meet outstanding scientists from outside Washington University. Several annual symposia bring internationally recognized speakers to campus. Journal clubs meet weekly for students, postdoctoral fellows and faculty to present and discuss current scientific literature. A number of Interdisciplinary Research Pathways allow students to enhance their PhD program. Program retreats allow for informal interaction among students and faculty. The Division also provides funds for each student for professional development.