



Plant & Microbial Biosciences, PhD

Degree Requirements

Plant & Microbial Biosciences

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

The Plant and Microbial Biosciences (PMB) Program trains PhD students to have a strong background in modern biology, as well as research training specific to vascular plants, mosses, algae, plant-associated microbes, photosynthetic prokaryotes, and other microbes as experimental organisms to address both fundamental and applied biological questions. Formal coursework requirements, teaching assistantship, and qualifying exam are usually satisfied in the first two years. Research training is accomplished by a combination of required research rotations in the first year followed by a significant thesis research project. Seminars and journal clubs help members of the program stay current with the latest scientific advances. DBBS also provides a wide variety of “beyond the bench” opportunities for students, including internships, career workshops, and science outreach opportunities to ensure that PMB graduates are well prepared for future careers in academia, industry, entrepreneurship, policy, science communication, and beyond.

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, students 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 5703 Experimental Design and Analysis in Biological Research
- BBS 5702 Current Approaches in Plant and Microbial Research
- One of the following:
 - BBS 5480 Nucleic Acids & Protein Biosynthesis
 - BBS 5068 Fundamentals of Molecular Cell Biology

6 Credits of Advanced Electives

Common electives include the following:

- BBS 5491 Advanced Genetics
- BBS 5068 Fundamentals of Molecular Cell Biology
- BBS 5352 Developmental Biology
- BBS 5392 Molecular Microbiology & Pathogenesis
- BBS 5495 Computational Molecular Biology
- BBS 5488 Genomics
- BBS 5014 Biotech Industry Innovators
- BBS 5053 How Plants Work: Physiology, Growth, and Metabolism
- BBS 5523 Laboratory in Protein Analysis, Proteomics, and Protein Structure
- BBS 5910 Nano Topics in Biology and Biomedical Sciences

Two Semesters of Journal Clubs

PMB students are required to take BBS 5723 Seminar in Plant and Microbial Bioscience. Other common journal clubs include the following:



- BBS 5820 Ethnobiology Journal Club
- BBS 5235 Genetics Journal Club Genetics Journal Club
- BBS 5148 Metabolism Journal Club Metabolism Journal Club
- BBS 5121 Development, Regeneration & Stem Cell Biology Journal Club

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.