

Molecular Cell Biology, PhD

Degree Requirements

Molecular Cell Biology

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

The overarching mission of the Molecular Cell Biology program is to provide rigorous training in elucidating the molecular mechanisms that underlie fundamental cellular processes in normal and disease contexts. These include autonomous and cooperative processes such as cell motility and adhesion, cell cycle regulation, transcription, translation, molecular trafficking, signal transduction, and metabolism. A unifying theme across these areas is a commitment to achieving a comprehensive molecular understanding of how cells function and adapt to internal and external pressures. By advancing mechanistic insights into these essential processes, our work enriches fundamental biological knowledge while establishing the molecular foundations for translational discovery. Ultimately, we aim to bridge mechanistic cell biology with patient-centered research — transforming molecular insights into actionable strategies for diagnosis, prevention, and therapy to improve human health worldwide.

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 5480 Nucleic Acids & Protein Biosynthesis
- BBS 5068 Fundamentals of Molecular Cell Biology

One Advanced Elective

MCB students are required to complete one three-credit advanced elective that has a grant writing component. Please consult with Program Directors for course recommendations.

Two Semesters of Journal Clubs

- BBS 5123 Experimental Hematopoiesis Journal Club
- BBS 5128 Cell Biology of Extracellular Matrix
- BBS 5137 Ion Channels
- BBS 5148 Metabolism Journal Club
- BBS 5152 Rad Journal Club (Regeneration, Aging, and Development)
- BBS 5192 Cancer Biology Journal Club
- BBS 5235 Genetics Journal Club
- BBS 5255 Experimental Skeletal Biology Journal Club
- BBS 5393 Molecular Virology Journal Club
- BBS 5412 Tropical and Molecular Parasitology
- BBS 5417 Hematology Division Journal Club: Current Topics in Cellular, Molecular, and Stem Cell Biology
- BBS 5445 DNA Metabolism Journal Club
- BBS 5484 Genetics and Development of C. Elegans Journal Club
- BBS 5496 Seminar in Computational Molecular Biology



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.