

BIOLOGICAL CHEMISTRY, PHD

Program Overview

The Graduate Program in Biological Chemistry (GPBC) is no longer accepting new students, effective Summer 2025.

The Graduate Program in Biological Chemistry (GPBC) is designed to train the next generation of independent research scientists, while simultaneously supporting the professional development and career choices of all our students. The core of our Ph.D.-granting program is learning through research, augmented by an advanced curriculum, supportive mentorship, professional development, and career training. GPBC's focus on discovery-based education is consistent with the founding of Johns Hopkins as the country's first research university and its current position as one of the world's preeminent research universities. The Department of Biological Chemistry is dedicated not only to the advancement of science, but also to the health, well-being, and dignity of its diverse members and the diverse community within which it resides. We recruit, retain and inspire the next generation of diverse trainees, faculty and staff members at our school of medicine and in our health system.

Admissions

The Graduate Program in Biological Chemistry (GPBC) is no longer accepting new students, effective Summer 2025.

Program Requirements

The Graduate Program in Biological Chemistry trains students through a diverse curriculum that emphasizes discovery-driven education. While the focus is on laboratory research, students also benefit from outstanding courses, immersive scientific activities, strong mentorship, professional development, and a commitment to publishing.

Research is the primary activity of GPBC students. Research starts immediately upon matriculation with a series of research rotations, and thereafter continues in their thesis studies.

Courses: Required and elective courses ensure that GPBC students acquire a solid foundation in biomedical research.

Immersive Scientific Activities: Students receive additional training by attending and participating in seminars, journal clubs, symposia, colloquia, and retreats within the Department of Biological Chemistry as well as those offered by other Departments, Centers, Institutes and Schools across the University

Mentorship: GPBC provides multidimensional mentorship from the moment students arrive on campus through and beyond their graduation, with direct support from the student's research advisor(s), co-mentor, Thesis Committee, and GPBC Director.

Professional Development: The GPBC supports the long-term career success of its graduates by providing:

- Outstanding, mechanistically-oriented research training
- OPTIONS career training curriculum
- Full access to all services of the School's Professional Development Office (PDO)

Publishing: Students complete their research requirement by publishing their dissertation, peer-reviewed articles, reviews, etc.

Courses:

The first year required courses are as follows:

- ME.100.716 Analysis of Macromolecules
- ME.330.709 Organic Mechanisms in Biology
- ME.260.709 Molecular Biology and Genomics
- ME.110.733 Principles of Genetics
- ME.110.728 Cell Structure and Dynamics
- ME.360.728 Pathways and Regulation
- ME.340.702 Rigor, Reproducibility & Experimental Design in Biological Chemistry
- ME.800.811 Introduction to Responsible Conduct of Research
- 4th Quarter Elective I
- 4th Quarter Elective II

Required courses beyond the first year:

ME.340.702 Rigor, Reproducibility & Experimental Design in Biological Chemistry
Four additional electives

GPBC Activities, By Year

Year 1

Student orientation day (day 1)
Biological Chemistry Bootcamp (week 1)
Participate in research rotations (3-4 rotations of 2 months-long duration each)
Participate in immersive scientific activities (seminars, journal clubs, colloquia, interest groups, etc.), both required and elective
Select thesis advisor/home laboratory & initiate thesis research

Year 2

Thesis research
Participate in immersive scientific activities
Write a thesis proposal
Take and pass the Doctoral Board Orals exam
Take and pass the required second-year class:
Rigor, Reproducibility & Experimental Design in Biological Chemistry, Yr. 2
Participate in OPTIONS career development curriculum
Form a thesis committee and identify a co-mentor
With the thesis advisor, draft and sign an individual development plan (IDP)
Participate in Thesis Committee meeting & GPBC Director meeting

Years 3, 4, & 5

Thesis research
Publish papers
Participate in immersive scientific activities
Take and pass any remaining elective classes
Annually: IDP, Thesis Committee meeting, and GPBC Director meeting
Work with mentors to develop/implement a career plan

Year 5+

Thesis research, with an emphasis on prompt graduation
Publish the dissertation and peer-reviewed articles
Participate in immersive scientific activities
Hold Thesis Committee meetings & GPBC Director meetings every 6 months

Implement the student's career plan