

MOLECULAR PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS (MPET) – PH.D. DEGREE

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Admission

Appointment Requirements

To be considered for admission to the Ph.D. program, applicants must:

1. Hold a bachelor's degree from an accredited college or university with a minimum 3.0 grade point average based on a 4.0 scale and supply the official transcript.
 - a. It is strongly recommended that candidates have completed at least one year of coursework, with demonstrated competence (B average or above), in the following undergraduate courses: biology, calculus, chemistry and physics.
 - b. In addition, foundation courses in biochemistry, molecular biology, cell biology and physiology are highly recommended. Biomedical Engineering and Physiology students are encouraged to have courses in quantitative science and engineering (e.g., signal processing, computer science, instrumentation).
2. Foreign applicants must demonstrate proof of English language proficiency to be considered for an appointment. This can be satisfied via the Test of English as a Foreign Language (TOEFL), or via other method as described on the English Language Proficiency Attestation.
3. Each track may establish additional requirements.
4. Applications will only be considered for review if they are submitted within the application submission window of September 1 – December 1 each year, for appointment in the following academic year.

Authority to make appointments rests with the Mayo Clinic Graduate School of Biomedical Sciences Education Committee. Falsifying or omitting information on or accompanying the application may disqualify an applicant from admission or subject a student to dismissal. The application and supporting documents become the property of MCGSBS upon receipt. The average number of years to degree is 5.2.

Inquiries regarding admission to the MCGSBS Ph.D. Program should be sent to this inquiry form (<https://college.mayo.edu/academics/biomedical-research-training/contact/>).

Admissions/Financial Support

- PhD students are fully supported through a guaranteed internal fellowship for five years, eliminating the need to identify a faculty member to provide financial support. The annual base stipend for PhD students funded by Mayo Clinic for the 2024-2025 academic year is \$40,000, deposited electronically bi-monthly in the student's bank of choice. The annual tuition fee is waived in full (\$27,000).
- Appointment and funding are conditional on remaining actively enrolled in the program, continuously meeting the qualifications, standards and requirements of the program and track.

- Funding may consist of graduate school, external fellowships and/or internal scholarships.
- Students are appointed for five years with designated program start and end dates.
- If required training exceeds the appointment length, a request for extension may be made for consideration. All extension requests require graduate school approval and funding to cover all student costs during the extension period are typically paid by the student's mentor.
- Training must be completed within a maximum of seven years, regardless of funding availability.
- Students who enter MCGSBS with pre-awarded Mayo department/division funding will continue under the terms of any such arrangements throughout the duration of their PhD training.

Transfer Credits

A total of 21 credits may be transferred into the Ph.D. Program. For more details, see the Credit Transfer and Waiver Policy on the MCGSBS Policies and Procedures intranet site.

Course Work

The curriculum for the Predoctoral degree consists of **68 credits**, which can include a maximum of 24 Research credits. (Matriculants prior to 2020 have 42 credit requirement, not counting Research credit.)

Code	Title	Hours
MGS		
MGS 5000	Foundational Skills (required for 2021 matriculants and forward)	1
MGS 5010	Rigor, Reproducibility, and Experimental Design	1
MGS 5020	Statistics for Biomedical Research	1
MGS 5030	Core Concepts in Genome Dynamics, Biochemistry, and Cellular Biology ¹	3
MGS 6000	Responsible Conduct of Research	1
MGS 5050	Critical Thinking and Scientific Writing ¹	2
MGS 5051	Critical Thinking and Scientific Writing, Part II	1
Lab Rotations²		
6 credits maximum, a minimum of 3 rotations		
MGS 5102	Ph.D. Laboratory Rotation	2
MGS 5107	Ph.D. Laboratory Rotation	2
MGS 5108	Ph.D. Laboratory Rotation	2
Track Requirements		
MPET 5808	Introduction to Molecular Pharmacology ²	4
MPET 5900	Molecular Pharmacology and Receptor Signaling	3
MPET 6800	Research Seminars in Pharmacology (1 cr./yr.)	4
MPET 6805	Drug Metabolism and Pharmacogenomics	2
Advanced Coursework		
Select 15 credits ³		15
Research		
MGS 6890	Predoctoral Research (3 cr./qtr x minimum 8 terms) ⁴	24
Total Hours		68

¹ M.D.-Ph.D. students may exclude these in accordance with M.D.-Ph.D. requirements.

² M.D.-Ph.D. students satisfy this requirement with three one-month full-time rotations.

³ Any courses approved for graduate credit; select in consultation with your thesis mentor.

⁴ Must enroll every quarter once a thesis laboratory is selected for remainder of program. Directed research projects under the supervision of a faculty mentor.

Qualifying Exams and Thesis Research

Written Qualifying Exam (WQE)

MPET learners from all degree programs can take WQE in July during their 1st or 2nd year.

At a minimum, the following courses should be completed before attempting the Written Qualifying Exam:

- MGS 5010 Rigor, Reproducibility, and Experimental Design
- MGS 5020 Statistics for Biomedical Research
- MGS 5030 Core Concepts in Genome Dynamics, Biochemistry, and Cellular Biology
- MPET 5900 Molecular Pharmacology and Receptor Signaling
- MPET 5808 Introduction to Molecular Pharmacology

In addition, at least one of the following courses is strongly recommended. (These courses are only offered every other year):

- MPET 6805 Drug Metabolism and Pharmacogenomics
- MPET 6655 Mechanisms of Cell Growth and Death
- MPET 6450 Applied Data Science and Artificial Intelligence in Pharmacology
- MPET 6814 Cellular Pharmacology of Agents that Target Cancer

WQE Format

The Written Qualifying Exam consists of demonstrating critical evaluation and understanding of 1 to 2 published papers. Six to 8 papers reflecting the key areas of emphasis of the track will be available 3 days prior to the exam. On exam day, learners are provided a set of questions for each of the papers, and the learner will select any paper for which to answer the questions on exam day. Concepts stemming from core coursework will also be investigated as relevant to the research articles. The exam is prepared and graded by the faculty and a grade of 70% is required for successful completion of the exam.

Oral Qualifying Exam

Please review the prior oral qualifying exam information noted on PhD Program page.

Thesis Proposal

A written thesis proposal in the format of an NIH F31 grant must be presented to your

Thesis Advisory Committee

Within two months of completing the oral qualifying exam. See also the Fellowship Application and Award Policy on the MCGSBS Policies and Procedures intranet site.

This is a suggested sequence based on a summer term start. Individual course plans may vary depending on true start date, program, and research interests. Be sure to confirm you have met your requirements using your

degree planning tool. Course offerings may vary slightly. Current course offerings are posted in the course catalog.

Code	Title	Hours
Fifth Year - Spring Term		
MGS 6890	Predocutorial Research	3
MPET 6800	Research Seminars in Pharmacology	1

Code	Title	Hours
First Year - Fall Term		
MGS 5107	Ph.D. Laboratory Rotation	2
MGS 5108	Ph.D. Laboratory Rotation	2
MPET 6800	Research Seminars in Pharmacology	1
MPET 5808	Introduction to Molecular Pharmacology	4

Code	Title	Hours
First Year - Winter Term		
MPET 6805	Drug Metabolism and Pharmacogenomics	2
MGS 6890	Predocutorial Research	3
Electives		

Code	Title	Hours
First Year - Spring Term		
MGS 6890	Predocutorial Research	3
MPET 5900	Molecular Pharmacology and Receptor Signaling	3
Electives		

Code	Title	Hours
Second Year - Summer Term		
MGS 6890	Predocutorial Research	3
MGS 5050	Critical Thinking and Scientific Writing	2
Electives		

Code	Title	Hours
Second Year - Fall Term		
MGS 6890	Predocutorial Research	3
MGS 5051	Critical Thinking and Scientific Writing, Part II	1
MPET 6800	Research Seminars in Pharmacology	1
Electives		

Code	Title	Hours
Second Year - Winter Term		
MGS 6890	Predocutorial Research	3
MPET 6800	Research Seminars in Pharmacology	1
Electives		

Code	Title	Hours
Second Year - Spring Term		
MGS 6890	Predocutorial Research	3
MPET 6800	Research Seminars in Pharmacology	1
Electives		

Code	Title	Hours
Third Year - Summer Term		
MGS 6890	Predocutorial Research	3

MPET 6800	Research Seminars in Pharmacology	1
Electives		

Code	Title	Hours
Fifth Year - Spring Term		

MGS 6890	Predoctoral Research	3
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MPET 6800	Research Seminars in Pharmacology	1
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Code	Title	Hours
Fifth Year - Spring Term		

MGS 6890	Predoctoral Research	3
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MPET 6800	Research Seminars in Pharmacology	1
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Fifth Year - Spring Term		

MGS 6890	Predoctoral Research	3
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