

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

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Admission

Appointment Requirements

Candidates for the Ph.D. Program must meet the following eligibility requirements:

- Completion of a bachelor's degree, preferably in the biological or physical sciences, from an accredited institution.
- A minimum cumulative undergraduate GPA of 3.0 on a 4.0 scale. GPAs from graduate degrees may also be considered for competitive candidates if improvement of academic record is evident.
- Applications are considered only if submitted within the application submission window of September 1 – December 1 each year, for appointment in the following academic year. See also Admissions and Application Process (<https://college.mayo.edu/academics/biomedical-research-training/phd-program/how-to-apply/>).
- Degree conferral before the program begins (program begins in July)
- The Ph.D. program does consider international applicants who can demonstrate proof of English language proficiency. See also international applicant information (<https://college.mayo.edu/academics/biomedical-research-training/phd-program/how-to-apply/international-applicant-information/>).

Suggested undergraduate coursework:

- Applicants to our Ph.D. program are encouraged to have completed coursework with demonstrated proficiency (B average or above) in their math and science courses. Additionally, advanced courses in biology, chemistry, and physiology are encouraged.
- Applicants interested in applying to the Biomedical Engineering and Physiology Track are advised to take courses in quantitative science and engineering, such as signal processing, computer science, and instrumentation.

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 2025-2026 academic year

is \$41,200, 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 Conversion, Transfer, Waiver, and Substitution 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, Experimental Design, and Data Management	1
MGS 5030	Core Concepts in Genome Dynamics, Biochemistry, Cellular Biology, and Physiology 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
Statistics²		
CTSC 5590	Foundations of Statistics in Clinical and Translational Research	
CTSC 5600	Introduction to Statistics in Clinical and Translational Research	
Lab Rotations³		
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 ³	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 CourseworkSelect 15 credits ⁴ 15**Research**MGS 6890 Predoctoral Research (3 cr./qtr x minimum 8 terms) ⁵ 24**Total Hours** 68¹ M.D.-Ph.D. students may exclude these in accordance with M.D.-Ph.D. requirements.² Choose one of the following options. Students must complete a minimum of 1 credit of statistics courses.³ M.D.-Ph.D. students satisfy this requirement with three one-month full-time rotations.⁴ Any courses approved for graduate credit; select in consultation with your thesis mentor.⁵ 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, Experimental Design, and Data Management
- Statistics Requirement (CTSC 5590 Foundations of Statistics in Clinical and Translational Research or CTSC 5600 Introduction to Statistics in Clinical and Translational Research)
- MGS 5030 Core Concepts in Genome Dynamics, Biochemistry, Cellular Biology, and Physiology
- 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.

Suggested Sequence

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
First Year - Summer Term		
MGS 5000	Foundational Skills	1
MGS 5010	Rigor, Reproducibility, Experimental Design, and Data Management	1
MGS 5030	Core Concepts in Genome Dynamics, Biochemistry, Cellular Biology, and Physiology	3
MGS 6000	Responsible Conduct of Research	1
MGS 5102	Ph.D. Laboratory Rotation	2
CTSC 5590	Foundations of Statistics in Clinical and Translational Research ¹	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	Predoctoral Research	3
CTSC 5600	Introduction to Statistics in Clinical and Translational Research ¹	3
Electives		
Code Title Hours		
First Year - Spring Term		
MGS 6890	Predoctoral Research	3
MPET 5900	Molecular Pharmacology and Receptor Signaling	3
Electives		
Code Title Hours		
Second Year - Summer Term		
MGS 6890	Predoctoral Research	3

MGS 5050	Critical Thinking and Scientific Writing	2
Electives		

Code	Title	Hours
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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
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Second Year - Winter Term

MGS 6890	Predocutorial Research	3
MPET 6800	Research Seminars in Pharmacology	1
Electives		

Code	Title	Hours
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Second Year - Spring Term

MGS 6890	Predocutorial Research	3
MPET 6800	Research Seminars in Pharmacology	1
Electives		

Code	Title	Hours
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Third Year - Summer Term

MGS 6890	Predocutorial Research	3
MPET 6800	Research Seminars in Pharmacology	1
Electives		

Code	Title	Hours
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Third Year - Fall Term

MGS 6890	Predocutorial Research	3
MPET 6800	Research Seminars in Pharmacology	1

Code	Title	Hours
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Third Year - Winter Term

MGS 6890	Predocutorial Research	3
MPET 6800	Research Seminars in Pharmacology	1

Code	Title	Hours
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Third Year - Spring Term

MGS 6890	Predocutorial Research	3
MPET 6800	Research Seminars in Pharmacology	1

Code	Title	Hours
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Fourth Year - Summer Term

MGS 6890	Predocutorial Research	3
MPET 6800	Research Seminars in Pharmacology	1

Code	Title	Hours
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Fourth Year - Fall Term

MGS 6890	Predocutorial Research	3
MPET 6800	Research Seminars in Pharmacology	1

Code	Title	Hours
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Fourth Year - Winter Term

MGS 6890	Predocutorial Research	3
MPET 6800	Research Seminars in Pharmacology	1

Code	Title	Hours
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Fourth Year - Spring Term

MGS 6890	Predocutorial Research	3
MPET 6800	Research Seminars in Pharmacology	1

Code	Title	Hours
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Fifth Year - Summer Term

MGS 6890	Predocutorial Research	3
MPET 6800	Research Seminars in Pharmacology	1

Code	Title	Hours
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Fifth Year - Fall Term

MGS 6890	Predocutorial Research	3
MPET 6800	Research Seminars in Pharmacology	1

Code	Title	Hours
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Fifth Year - Winter Term

MGS 6890	Predocutorial Research	3
MPET 6800	Research Seminars in Pharmacology	1

Code	Title	Hours
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Fifth Year - Spring Term

MGS 6890	Predocutorial Research	3
MPET 6800	Research Seminars in Pharmacology	1

¹ A minimum of 1 credit of statistics courses are required. See program requirements for course options and details.