### MOLECULAR AND CELLULAR PHARMACOLOGY, M.S.

The Molecular and Cellular Pharmacology (MCP) program, in cooperation with the Center for Training in Pharmacology and Drug Development (CTPDD), offers interdisciplinary graduate training in the field of molecular and cellular pharmacology. The primary emphasis is doctoral training in molecular biology, biochemistry, genetics, and cell biology with a focus on integrating these methodologies with modern pharmacology. Other related degree programs under the direction of program faculty are cellular and molecular biology, environmental toxicology, neuroscience, biomolecular chemistry, and genetics.

Pharmacology is the knowledge of the biochemical and physiological actions of drugs, which act on cellular signaling pathways. The molecular basis of cellular signaling and its control by various drugs is a major aspect of modern pharmacology and this aspect is emphasized in the Molecular and Cellular Pharmacology Training Program. The majority of signal transduction pathways still await discovery or at least a thorough molecular characterization. Members of our program employ the whole spectrum of modern biochemical, cell and molecular biological, physiological, and pharmacological methods in a basic research-oriented scientific environment to unravel the many unsolved mysteries underlying cellular regulation and signaling. Certain research initiatives have a translational component, with the goal of applying basic discoveries to developing new therapeutic modalities. Our program brings together an outstanding group of dedicated trainers with a focus on cellular signal transduction.

Graduates of the program will be well prepared for a career in basic biomedical sciences in academia, industry, and more. We provide a unique training experience for young scientists who want to elucidate basic principles of cellular signal pathways. Detailed knowledge of these pathways is the most important prerequisite for the discovery of new drugs and the treatment of diseases. The members of the Molecular and Cellular Pharmacology Training Program invite you to examine the educational and research opportunities described at this site, and to consider joining this unique and exciting graduate program.

### ADMISSIONS

This master’s program is offered for work leading to the Ph.D. Students may not apply directly for the master’s, and should instead see the admissions information for the Ph.D (http://guide.wisc.edu/graduate/medicine-public-health-school-wide/molecular-cellular-pharmacology-phd).

### FUNDING

**GRADUATE SCHOOL RESOURCES**

Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid. Further funding information (https://grad.wisc.edu/funding) is available from the Graduate School. Be sure to check with your program for individual policies and processes related to funding.

### REQUIREMENTS

#### MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/#policiesandrequirementstext), in addition to the program requirements listed below.

#### MAJOR REQUIREMENTS

**MODE OF INSTRUCTION**

<table>
<thead>
<tr>
<th>Face to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

**Mode of Instruction Definitions**

- **Evening/Weekend:** These programs are offered in an evening and/or weekend format to accommodate working schedules. Enjoy the advantages of on-campus courses and personal connections, while keeping your day job. For more information about the meeting schedule of a specific program, contact the program.
- **Online:** These programs are offered primarily online. Many available online programs can be completed almost entirely online with all online programs offering at least 50 percent or more of the program work online. Some online programs have an on-campus component that is often designed to accommodate working schedules. Take advantage of the convenience of online learning while participating in a rich, interactive learning environment. For more information about the online nature of a specific program, contact the program.
- **Hybrid:** These programs have innovative curricula that combine on-campus and online formats. Most hybrid programs are completed on-campus with a partial or completely online semester. For more information about the hybrid schedule of a specific program, contact the program.
- **Accelerated:** These on-campus programs are offered in an accelerated format that allows you to complete your program in a condensed time-frame. Enjoy the advantages of on-campus courses with minimal disruption to your career. For more information about the accelerated nature of a specific program, contact the program.

#### CURRICULAR REQUIREMENTS

<table>
<thead>
<tr>
<th>Minimum Requirement</th>
<th>30 credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit Requirement</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minimum Residence Credit Requirement</th>
<th>16 credits</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Minimum Graduate Coursework Requirement</th>
<th>Half of degree coursework (15 credits out of 30 total credits) must be completed graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university’s Course Guide (<a href="https://registrar.wisc.edu/course-guide/">https://registrar.wisc.edu/course-guide/</a>).</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Overall Graduate GPA Requirement</th>
<th>3.00 GPA required.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Thesis Option</th>
<th>9 credits</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Comprehensive Examination</th>
<th>4 credits</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Oral Defense</th>
<th>3 credits</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Dissertation</th>
<th>6 credits</th>
</tr>
</thead>
</table>
The Graduate School requires an average grade of B or better in all coursework (300 or above, not including research credits) taken as a graduate student unless conditions for probationary status require higher grades. Grades of Incomplete are considered to be unsatisfactory if they are not removed during the next enrolled semester.

Assessments and Examinations
Contact the program for information on required assessments and examinations.

Language
Contact the program for information on any language requirements.

### REQUIRED COURSES

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHMCOL-M 781</td>
<td>Molecular and Cellular Principles in Pharmacology</td>
<td>4</td>
</tr>
<tr>
<td>PHM/M/ENVTOX/MEDICINE/ONCOLOGY/PHM SCI/POP HLTH 625</td>
<td>Toxicology I</td>
<td>3</td>
</tr>
<tr>
<td>PHM/M/BIOCHEM/ZOOLOGY 630</td>
<td>Cellular Signal Transduction Mechanisms</td>
<td>3</td>
</tr>
<tr>
<td>OBS&amp;GYN 955</td>
<td>Responsible Conduct of Research for Biomedical Graduate Students</td>
<td>2</td>
</tr>
</tbody>
</table>
| Research & Seminar
| PHM/M 901       | Seminar and Journal Club                      | 1       |
| PHM/M 990       | Research                                      | 2       |

1 Students are required to take 1 credit of seminar each fall and spring semester during enrollment as a graduate student in the program.

2 Students must take research credits every semester. Credits will vary.

### POLICIES

#### GRADUATE SCHOOL POLICIES

The Graduate School's Academic Policies and Procedures ([https://grad.wisc.edu/acadpolicy](https://grad.wisc.edu/acadpolicy)) provide essential information regarding general university policies. Program authority to set degree policies beyond the minimum required by the Graduate School lies with the degree program faculty. Policies set by the academic degree program can be found below.

#### MAJOR-SPECIFIC POLICIES

**GRADUATE PROGRAM HANDBOOK**


#### PRIOR COURSEWORK

**Graduate Work from Other Institutions**

With program approval, students are allowed to count no more than 7 credits of graduate coursework from other institutions.

Coursework earned five or more years prior to admission to a master's degree is not allowed to satisfy requirements.

**UW–Madison Undergraduate**

No credits from a UW–Madison undergraduate degree are allowed to count toward the degree.

**UW–Madison University Special**

With program approval, students are allowed to count no more than 15 credits of coursework numbered 300 or above taken as a UW–Madison Special student. Coursework earned five or more years prior to admission to a master's is not allowed to satisfy requirements.

#### PROBATION

The Graduate School regularly reviews the record of any student who earned grades of BC, C, D, F, or Incomplete in a graduate course (300 or above), or grade of U in research credits. This review could result in academic probation with a hold on future enrollment or in being suspended from the Graduate School.

#### ADVISOR / COMMITTEE

Every graduate student is required to have an advisor and committee. The advisor serves a dual role: first, to assist the student in acquiring the highest level of knowledge and competence in the field that is possible; and second, to chair the committee that will determine whether the student has performed acceptably at each of his/her degree milestones. The chair or co-chair of the committee must be Graduate Faculty from the student's program. Advisors may assist in tracking the student's progress toward degree completion, assisting with course selection and academic planning, and helping students identify possible research mentors, committee members, and opportunities.

Master's thesis committees must have at least three members; two must be Graduate Faculty or former Graduate Faculty up to one year after resignation or retirement.

#### CREDITS PER TERM ALLOWED

15 credits

#### TIME CONSTRAINTS

Master's degree students who have been absent for five or more consecutive years lose all credits that they have earned before their absence. Individual programs may count the coursework students completed prior to their absence for meeting program requirements; that coursework may not count toward Graduate School credit requirements.

#### OTHER

All students in the Graduate Program in Molecular and Cellular Pharmacology receive competitive stipends to cover living expenses, tuition and fees from Graduate School Fellowships, NIH Training Grants, or research assistantships funded through the Graduate Program. Health insurance costs are partially covered by the university and provide the same coverage as for faculty and staff.
PROFESSIONAL DEVELOPMENT

GRADUATE SCHOOL RESOURCES
Take advantage of the Graduate School’s professional development resources (https://grad.wisc.edu/pd) to build skills, thrive academically, and launch your career.

PROGRAM RESOURCES
The MCP Program and UW–Madison offer a wealth of resources intended to enrich graduate student studies and enhance professional skills. It is expected that students will take full advantage of the resources that best fit their needs and support their career goals. Since MCP alumni thrive in academia, industry, corporate, government, and non-profit arenas, we strive to be holistic and innovative in our approach to meeting the diverse professional development needs of our students. By actively participating in these professional development opportunities, students will build the skills needed to succeed academically at UW–Madison and to thrive professionally in their chosen career. For the most updated information, please visit: MCP Program Professional Development (https://molpharm.wisc.edu/career-development)

LEARNING OUTCOMES

1. Gain a broad understanding of the pharmacological principles that underlie all biological processes.

2. Become aware of the current limitations of the state of understanding of this discipline and the strategies that are required to advance the field of pharmacology.

3. Creates new approaches in research, scholarship, or performance that makes a substantive contribution.

4. Conduct independent research using a breadth of pharmacological processes.

5. Think critically to address research challenges using a broad range of the theories, research methods, and approaches to scientific inquiry.

6. Collaborate with investigators within the program, university, and beyond since current and future advances in pharmacological sciences demand interdisciplinary skills.

7. Fosters ethical and professional conduct in the sciences, including but not limited to: exposition of the scientific method; ethical design of experimental protocols; reproducibility in science; professional behavior in industrial, government, and academic settings; documentation of scientific results; communication to other scientists and the public; peer review; and confidentiality.

8. Communicates complex ideas in a clear and understandable manner.

9. Explore career development opportunities in industry, government, and academia to realize professional goals and paths.

10. Develop teaching and mentoring skills in both lecture and laboratory settings.

PEOPLE