MOLECULAR AND CELLULAR PHARMACOLOGY, PH.D.

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

The Graduate School sets minimum requirements for admissions (https://grad.wisc.edu/admissions/requirements). Academic program admission requirements are often more rigorous than those set by the Graduate School. Please check the MCP Program website (https://molpharm.wisc.edu/admissions-how-to-apply) for details.

GRADUATE SCHOOL ADMISSIONS

Graduate admissions is a two-step process between academic degree programs and the Graduate School. Applicants must meet requirements of both the program(s) and the Graduate School. Once you have researched the graduate program(s) you are interested in, apply online (https://grad.wisc.edu/admissions).

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.

PROGRAM RESOURCES

ANNUAL STIPEND AND BENEFITS

All students receive competitive stipends to cover living expenses. The benefits package also includes tuition remission and a choice of comprehensive health insurance plans which include medical, dental, and vision at a minimal cost. It is the same coverage offered to faculty and staff.

TRAINING GRANTS

Many of our graduate students are supported by NIH training grants. Prospective students must be nominated by the MCP Admissions Committee or by faculty mentors to receive training grant support from the MCP NIH T32 GM008688. Opportunities may also be available during the first semester of study, and students are encouraged to contact the MCP program for assistance with the nomination process.

FELLOWSHIPS

Some students are supported by University fellowships administered by the University’s Office of Fellowships at the Graduate School. Prospective students must be nominated by the program, and awardees are chosen by the UW Fellowships Committee. Other extramural funding sources include NIH, NSF, DOD, DOE, AHA, PhRMA, and more. Students can receive application assistance from the program and the university.

Prospective students should check the MCP Program website (https://molpharm.wisc.edu/funding-available-to-mcp-students) for the most updated funding information.

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 Credit Requirement</th>
<th>51 credits</th>
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**Minimum Residence Credit Requirement**

<table>
<thead>
<tr>
<th>Credit Requirement</th>
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</thead>
<tbody>
<tr>
<td>32 credits</td>
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</table>

**Minimum Graduate Coursework Requirement**

<table>
<thead>
<tr>
<th>Requirement</th>
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<tbody>
<tr>
<td>Half of degree coursework (26 credits out of 51 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="http://my.wisc.edu/CourseGuideRedirect/BrowseByTitle">http://my.wisc.edu/CourseGuideRedirect/BrowseByTitle</a>).</td>
</tr>
</tbody>
</table>

**Overall Graduate GPA Requirement**

<table>
<thead>
<tr>
<th>Requirement</th>
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<tbody>
<tr>
<td>3.00 GPA required.</td>
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</table>

**Other Grade Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

**Assessments and Examinations**

<table>
<thead>
<tr>
<th>Requirement</th>
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<tbody>
<tr>
<td>Doctoral students are required to take a comprehensive preliminary/oral examination after they have cleared their record of all Incomplete and Progress grades (other than research and thesis). Deposit of the doctoral dissertation in the Graduate School is required.</td>
</tr>
</tbody>
</table>

**Language Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
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<tbody>
<tr>
<td>Contact the program for information on any language requirements.</td>
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</tbody>
</table>

**Doctoral Minor/Breadth Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
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<tbody>
<tr>
<td>Doctoral students are not required to complete a minor, but may do so if they wish.</td>
</tr>
</tbody>
</table>

### 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>
</tbody>
</table>

**PHMCOL-M/ M&ENVTOX/ MEDICINE/ ONCOLOGY/ PHM SCI/ POP HLTH 625**

<table>
<thead>
<tr>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicology I</td>
<td>3</td>
</tr>
</tbody>
</table>

**PHMCOL-M/ BIOCHEM/ ZOOLOGY 630**

<table>
<thead>
<tr>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellular Signal Transduction Mechanisms</td>
<td>3</td>
</tr>
</tbody>
</table>

**OBS&GYN 955**

<table>
<thead>
<tr>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsible Conduct of Research for Biomedical Graduate Students</td>
<td>2</td>
</tr>
</tbody>
</table>

**Research & Seminar**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHMCOL-M 901</td>
<td>Seminar and Journal Club¹</td>
<td>1</td>
</tr>
<tr>
<td>PHMCOL-M 990</td>
<td>Research²</td>
<td>2</td>
</tr>
</tbody>
</table>

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) 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 ten years or more prior to admission to a doctoral 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 ten years or more prior to admission to a doctoral degree 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.

Minimum requirements for graduate committees are as follows:

- The chair or co-chair of the committee must be graduate faculty from the student's major program.
- The co-advisor/co-chair will be designated on dissertation documentation.
- Doctoral committees (Ph.D.) must have at least four members, three of whom must be MCP graduate faculty or former graduate faculty up to one year after resignation or retirement. At least one of the members must be from outside of the student's major field.
- At least three committee members of all doctoral/final oral examination committees must be designated as readers.
- Doctoral degree recipients must acknowledge in the dissertation contributions received from other individuals, including co-authors of published work that appears in the document, such as in designing the research, executing the research, analyzing the data, interpreting the data/research, or writing, proofing, or copyediting the manuscript.

**CREDITS PER TERM ALLOWED**

15 credits

**TIME CONSTRAINTS**

Doctoral degree students who have been absent for ten 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.

A candidate for a doctoral degree who fails to take the final oral examination and deposit the dissertation within five years after passing the preliminary examination may require to take another preliminary examination and to be admitted to candidacy a second time.

**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