MOLECULAR & INTEGRATIVE PHYSIOLOGY, PHD

for the degree of Doctor of Philosophy in Molecular & Integrative Physiology

The doctoral program uses a flexible approach to curriculum requirements. Students are required to take two core courses, three laboratory rotations (five weeks each), and electives. The students in consultation with a faculty advisory committee choose additional courses in chemistry, biochemistry, immunology, molecular biology, mathematics, and cell biology. Students are encouraged to begin research as soon as they identify an area of research interest. The department has a particularly strong focus in cell physiology, comparative physiology, computational biology, neurophysiology, and endocrinology. Courses and lab research are supplemented by a weekly seminar series. Toward the end of the second year, students must submit a report describing their initial research and pass an oral qualifying examination in order to continue in the PhD program. One year after their qualifying examinations, and no later than the end of their eighth semester in the program, students are expected to take their preliminary examinations in which they present their thesis topic and preliminary research to a faculty committee. Finally, a thesis, which is based on original work in one area of physiology and which demonstrates a thorough knowledge of underlying theories and experimental approaches, must be defended at the final examination. Most students complete their PhD training in four to five years.

Graduate Degree Program in Molecular & Integrative Physiology

Molecular & Integrative Physiology, PhD (p. 1)

The PhD program in Molecular and Integrative Physiology (MIP) is designed to provide individualized training in preparation for research and teaching careers in molecular, cellular, and integrative physiology. The objective of the training is to produce scientists who are technically competent and broadly educated. Students interested in the MIP PhD program must apply directly to the School of Molecular and Cellular Biology (http://mcb.illinois.edu/). During the first semester, students perform three laboratory rotations, choosing from any laboratory in the School. Students select a laboratory for their thesis research in December and formally join the appropriate graduate program at that time.

Admission

Applicants interested in the Molecular & Integrative Physiology PhD program will need to apply directly to the School of Molecular and Cellular Biology (MCB) PhD program (https://mcb.illinois.edu/graduate/gradprospect/). The MCB PhD program is an umbrella program that requires admitted students to spend their first semester rotating among three different labs to explore their interests before joining one of our four departments.

MCB Admission requirements include a bachelor’s degree in biological or physical sciences, a grade point average of a 3.0 or higher (A = 4.0), prior research experience, and three letters of recommendation from individuals who can attest to the applicant’s academic and research background. The Graduate Record Examination (GRE) is not required. Applicants interested in pursuing a PhD in Molecular & Integrative Physiology should have a strong background in biology, chemistry, and mathematics. In addition to these requirements, non-native English speaking applicants must attain a minimum Test of English as a Foreign Language (TOEFL) overall score of 96, with at least a score of 22 on the speaking section. MCB does not accept the International English Language Testing System (IELTS) to show English proficiency. Graduate College requirements also apply.

Graduate Teaching Experience

Experience in teaching is considered a vital part of the graduate program and is required as part of the academic work of all PhD candidates in this program. Minimum teaching requirement is 50% for one semester. However, it is strongly recommended that students gain experience equivalent to 50% for at least two semesters.

Financial Aid

Financial support is guaranteed for all students who remain in good academic standing.

for the degree of Doctor of Philosophy in Molecular & Integrative Physiology

The doctoral program uses a flexible approach to curriculum requirements. Students are required to take two core courses, three laboratory rotations (five weeks each), and electives. The students in consultation with a faculty advisory committee choose additional courses in chemistry, biochemistry, immunology, molecular biology, mathematics, and cell biology. Students are encouraged to begin research as soon as they identify an area of research interest. The department has a particularly strong focus in cell physiology, comparative physiology, computational biology, neurophysiology, and endocrinology. Courses and lab research are supplemented by a weekly seminar series. Toward the end of the second year, students must submit a report describing their initial research and pass an oral qualifying examination in order to continue in the Ph.D. program. One year after their qualifying examinations, and no later than the end of their eighth semester in the program, students are expected to take their preliminary examinations in which they present their thesis topic and preliminary research to a faculty committee. Finally, a thesis, which is based on original work in one area of physiology and which demonstrates a thorough knowledge of underlying theories and experimental approaches, must be defended at the final examination. Most students complete their Ph.D. training in four to five years.

For additional details and requirements refer to the Department’s Student Guide (http://mcb.illinois.edu/departments/mip/gradstudentguide.html) and the Graduate College Handbook (http://www.grad.illinois.edu/gradhandbook/).

Entering with approved M.S. degree

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCB 401</td>
<td>Cellular Physiology and Sys &amp; Integrative Physiology</td>
<td>6</td>
</tr>
<tr>
<td>&amp; MCB 402</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MCB 501</td>
<td>Advanced Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>MCB 502</td>
<td>Advanced Molecular and Cell Biology</td>
<td>4</td>
</tr>
<tr>
<td>MCB 509</td>
<td>Curr Topics Mol &amp; Int Physiol</td>
<td>2</td>
</tr>
<tr>
<td>MCB 580</td>
<td>Res Ethics &amp; Responsibilities</td>
<td>1</td>
</tr>
<tr>
<td>MCB 581</td>
<td>Laboratory Rotation I</td>
<td></td>
</tr>
<tr>
<td>&amp; MCB 582</td>
<td>and Laboratory Rotation II</td>
<td>9</td>
</tr>
<tr>
<td>&amp; MCB 583</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Six credit hours taken from the department’s Course Menu. See course list tab.

Required registration in MIP 590 each semester until passing the qualifying exam

Thesis Hours Required (0 min applied toward degree) 0

Total Hours 64

Other Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other requirements may overlap</td>
<td></td>
</tr>
<tr>
<td>All graduate students in the Program are required to teach during their graduate training. The minimum teaching requirement is 50% for one semester.</td>
<td></td>
</tr>
<tr>
<td>Successful completion of 96 hours of study (including the Core Courses with a grade A or B).</td>
<td></td>
</tr>
</tbody>
</table>

Qualifying Exam Required Yes
Preliminary Exam Required Yes
Final Exam/Dissertation Defense Required
Dissertation Deposit Required Yes
Minimum GPA: 2.75

for the degree of Doctor of Philosophy in Molecular & Integrative Physiology

Department Course Menu

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCB 400</td>
<td>Cancer Cell Biology</td>
<td>3</td>
</tr>
<tr>
<td>MCB 408</td>
<td>Immunology</td>
<td>3</td>
</tr>
<tr>
<td>MCB 410</td>
<td>Developmental Biology, Stem Cells and Regenerative Medicine</td>
<td>3</td>
</tr>
<tr>
<td>MCB 413</td>
<td>Endocrinology</td>
<td>3</td>
</tr>
<tr>
<td>MCB 419</td>
<td>Brain, Behavior &amp; Info Process</td>
<td>3</td>
</tr>
<tr>
<td>MCB 429</td>
<td>Cellular Microbiology &amp; Disease</td>
<td>3</td>
</tr>
<tr>
<td>MCB 431</td>
<td>Microbial Physiology</td>
<td>3</td>
</tr>
<tr>
<td>MCB 432</td>
<td>Computing in Molecular Biology</td>
<td>3</td>
</tr>
<tr>
<td>MCB 442</td>
<td>Comparative Immunobiology</td>
<td>4</td>
</tr>
<tr>
<td>MCB 461</td>
<td>Cell &amp; Molecular Neuroscience</td>
<td>3</td>
</tr>
<tr>
<td>MCB 462</td>
<td>Integrative Neuroscience</td>
<td>3</td>
</tr>
<tr>
<td>MCB 467</td>
<td>Bioinformatics</td>
<td>4</td>
</tr>
<tr>
<td>MCB 480</td>
<td>Eukaryotic Cell Signaling</td>
<td>2</td>
</tr>
<tr>
<td>MCB 493</td>
<td>Special Topics Mol Cell Biol (Human Metabolic Disease)</td>
<td>1 to 4</td>
</tr>
<tr>
<td>ECE 480</td>
<td>Magnetic Resonance Imaging</td>
<td>3 or 4</td>
</tr>
<tr>
<td>ANSC 445</td>
<td>Statistical Methods</td>
<td>4</td>
</tr>
<tr>
<td>ANSC 542SOC 476</td>
<td>Applied Bioinformatics</td>
<td>4</td>
</tr>
<tr>
<td>ANSC 542SOC 478</td>
<td>Immunological Methods</td>
<td>3</td>
</tr>
<tr>
<td>MCB 530</td>
<td>Reproductive Physiol Seminar</td>
<td>1</td>
</tr>
<tr>
<td>ECE 415</td>
<td>Biomedical Instrumentation Lab</td>
<td>2</td>
</tr>
</tbody>
</table>

These courses need to be approved to count:

- MCB 493 Special Topics Mol Cell Biol
- MCB 529 Special Topics in Cell and Developmental Biology
- NEUR 520 Advanced Topics in Neuroscience
- MIP Seminars in Physiology

for the degree of Doctor of Philosophy in Molecular & Integrative Physiology

1. Acquire in-depth, leading-edge knowledge of physiological function at multiple levels of biological organization spanning molecular, cellular, tissue and organismal levels.

Information listed in this catalog is current as of 10/2023
2. Learn the skills and methodologies of scientific inquiry necessary to conduct original, independent research in physiology that expands the frontiers of knowledge in the field.

3. Develop the professional skills for responsible conduct of research and embody the ethical principles necessary to behave with honesty, integrity, objectivity, and respect in all professional interactions.

4. To develop effective scientific literacy skills necessary to read, write, critique, and analyze a wide range of written materials, including primary scientific literature, review articles, grant proposals, and teaching materials.

5. To become an effective oral communicator of scientific information in multiple settings, including individual and small group discussions, seminars, classroom instruction, and public engagement.

for the degree of Doctor of Philosophy in Molecular & Integrative Physiology

Department of Molecular & Integrative Physiology
Head of Department: Claudio Grosman
Director of Graduate Studies: Lori Raetzman
Molecular & Integrative Physiology Department website (https://mcb.illinois.edu/departments/mip/)
524 Burrill Hall, 407 South Goodwin Avenue, Urbana, IL 61801
(217) 333-1735
Molecular & Cellular Biology Graduate Admissions email (mcb-grad@illinois.edu)

College of Liberal Arts & Sciences
College of Liberal Arts & Sciences website (https://las.illinois.edu/)

School of Molecular & Cellular Biology
School of Molecular & Cellular Biology website (http://mcb.illinois.edu)

Admissions
Overview of MCB Admissions Requirements (https://mcb.illinois.edu/graduate/gradprospect/)
Graduate College Admissions & Requirements (https://grad.illinois.edu/admissions/apply/)

Information listed in this catalog is current as of 10/2023