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Pharmacology and Physiology Graduate Student Handbook

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1. Preface

This handbook summarizes the policies of the graduate program in the Department of Pharmacology and Physiology. The general policies for graduate study at the University of Rochester are contained in the *Official Bulletin of Graduate Studies,* [http://www.rochester.edu/GradBulletin](http://www.rochester.edu/GradBulletin), and in the *Student Handbook of the School of Medicine and Dentistry,* [http://www.urmc.rochester.edu/education/graduate/trainee-handbook/](http://www.urmc.rochester.edu/education/graduate/trainee-handbook/). Since policies continually evolve to respond to changing needs of the graduate program and our students, and it is imperative that students and faculty advisors verify important decisions with the Director of Graduate Studies.

2. Program Objective

The objective of the graduate programs in pharmacology and physiology at the University of Rochester is to provide a state-of-the-art learning environment in which students explore the molecular and cellular mechanisms that enable organisms to detect and respond to signaling molecules and pharmacologic agents. Each student will acquire the range of technical, analytical, and critical skills required to successfully pursue a research career in academia or in the biotechnology/pharmaceutical industry. The program offers Ph.D. degrees in both Pharmacology and Physiology. The Ph.D. degree is awarded upon completion of scholarly work and research described in a publishable dissertation. Our Program websites are listed below. [http://www.urmc.rochester.edu/pharmacology-physiology/index.cfm](http://www.urmc.rochester.edu/pharmacology-physiology/index.cfm) [http://www.urmc.rochester.edu/education/graduate/phd/pharmacology-and-physiology/](http://www.urmc.rochester.edu/education/graduate/phd/pharmacology-and-physiology/)

3. Program Administration

The graduate program in pharmacology and physiology is administered by the Director of Graduate Studies, the Graduate Studies Committee, and the faculty of the Department of Pharmacology and Physiology. The day-to-day activities of the program are managed largely by the Director of Graduate Studies. The review and acceptance of applicants into the program and the review of students enrolled in the program is the responsibility of the Graduate Studies
Committee. The Pharmacology and Physiology faculty will participate in major policy decisions concerning the graduate program.

4. Doctoral Programs in Pharmacology and Physiology

A. Enrollment: Students formally enter the graduate studies program of the Department of Pharmacology and Physiology following completion of their first-year of study in one of the first-year program areas. The objective of the Graduate Program in Pharmacology and Physiology at the University of Rochester is to train scientists in molecular and integrative pharmacology and physiology and prepare them for successful careers in independent research and teaching. The program offers Ph.D. degrees in both pharmacology and physiology and includes courses in basic and advanced biomedical sciences, pharmacology, and physiology; original laboratory research; and the preparation and defense of a doctoral thesis. After successful completion of their first year of study, students choosing to enter into the Graduate Program in Pharmacology and Physiology must designate a thesis advisor and Ph.D. track (Pharmacology or Physiology). The selection of a thesis advisor requires approval by the Director of Graduate Studies and the Graduate Studies Committee. A faculty member may not be able to accept a student for some of the following reasons: (1) insufficient laboratory space or facilities; (2) lack of funds to support research; (3) commitments that prevent the faculty member from devoting sufficient time to the student’s training and education; and (4) plans for a sabbatical leave. Students wishing to make a change in their selection of thesis advisor must petition the Director of Graduate Studies and provide the Graduate Studies Committee with the rationale for electing a different advisor.

B. Laboratory Rotations: All first-year students must successfully complete at least three laboratory rotations before formally entering the program in Pharmacology or Physiology. Under most cases, these rotations will have been completed during the student’s first year of study as a member of one of the graduate research programs in the biomedical and health sciences program. These laboratory rotations provide an opportunity to gain a broader perspective of the sciences of pharmacology and physiology and, at the same time, allow the student to become familiar with the diverse investigative activities being pursued within the
University of Rochester Medical Center. Typically, faculty who are interested in having students rotate in their laboratory present brief overviews of their research projects at the beginning of the semester to highlight ongoing studies. However, students are encouraged to contact faculty directly to determine whether the faculty member is accepting students. The duration of each rotation is 10 weeks, and students are expected to spend at least 10-12 hours per week in the lab.

The Program Director will meet with students at the beginning of their first academic year to discuss faculty expectations of student performance during the rotation period. To obtain a satisfactory grade for a rotation, a student must participate in the activities of the lab (such as journal clubs and lab meetings), complete experimental activities agreed upon, and be able to demonstrate proper documentation, analysis, and presentation of acquired data. At the end of each rotation, an evaluation written by the mentor will be discussed with the student. The student will also write an evaluation of their laboratory rotation and both evaluations will be submitted to the Senior Associate Dean, Edith M. Lord (edith_lord@urmc.rochester.edu), SMDGradEval@urmc.rochester.edu, the CMPP Program Director (gregory_tall@urmc.rochester.edu), the program coordinator (sandra_morgan@urmc.rochester.edu), and the student.

http://www.urmc.rochester.edu/education/graduate/home/forms.cfm

Rotation Talks

Towards the middle of the spring semester, students will present a 15-minute talk summarizing a research project performed during one of their laboratory rotations. First-year students and members of the Graduate Studies Committee attend these research presentations. Students receive verbal feedback at the end of the sessions. First-year students will also present a 30 minute talk at the end of the semester as part of the student colloquium.
C. **Coursework:** The following courses, or acceptable equivalents as determined by the Graduate Studies Committee, are required of all Ph. D. candidates:

**Required courses (26 credit hour, total):**

- IND 408 Adv. Biochemistry (5 credit hours)
- IND 409 Cell Biology (4 credit hours)
- IND 410 Molecular Biology (4 credit hours)
- IND 501 Ethics in Research (1 credit hours)
- PHP 403 Human Cell Physiology (4 credit hours)
- PHP 502 Seminar (4 credit hours)
- PHP 404 Principles of Pharmacology (4 credit hours)

**Elective courses (6 credit hours, total):**

- IND 447/PHP447 Signal Transduction (4 credit hours)
- PHP 440 Topics in Vascular Biology (2 credit hours)
- PHP 550 Ion Channels and Disease (2 credit hours)
- MBI 473 Immunology (3 credit hours)
- NSC 525 Biology of Neurological Diseases (3 credit hours)
- BST 463 Introduction to Biostatistics (4 credit hours)
- PTH 507 Cancer Biology (3 credit hours)
- PTH 509 Pathways to Human Disease I (4 credit hours)
- PTH 510 Pathways to Human Disease II (4 credit hours)
- PTH 571 Molecular Basis of Disease (3 credit hours)
- CVS 401 Cardiovascular Biology and Disease (3 credit hours)

Selection of appropriate elective courses that complement the student’s research area should be done in conjunction with the student’s thesis advisor in consultation with the Director of Graduate Studies. Students are expected to complete PHP 403 and PHP 404 during their first year of study. Requests to take elective courses that are not on the recommended list, or to take PHP 403/404 after their first year, require approval of the Graduate Studies Committee. Requests for approval should be made prior to the semester in which the course is held.
**Writing Training**

Beginning with the class matriculating in 2013, we now require that each first-year student write two-page reports, due at the end of their 1st and 2nd laboratory rotations describing the research problem encountered during the rotation. The reports will include the following subsections: background, significance/rationale, approach, future directions, and references (references not included in page limit). The reports will be evaluated by the rotation advisors and the results of the evaluations will be reported to the CMPP graduate studies committee. Then, with a due date of July 31, 2015 (and each subsequent July 31 for future first-year classes), students will write a five-page report on any one of the three rotations of their choosing (most likely from the lab that has been joined). This report will follow the same format as the two-page interim reports, but it will be evaluated by two members of the CMPP Committee. The overall evaluation of these three writing exercises will be considered one part of each student’s end of first year evaluation. Students selected to take the first-year exam will be exempt from writing the five-page report.

D. **Grades and Progress Evaluation:** All required courses, with the exception of PHP 502, PHP 595, and IND 501 must be taken on the A/E system; PHP 502, PHP 595, and IND 501 are taken on the S/E system. Minimum passing grades for courses and research carrying credit are C or S, although C is considered a failure for any student on probation. Students who receive a grade of C in any two courses will be terminated from the program.

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Faculty Review of Student Performance

At the conclusion of the academic year, the Graduate Studies Committee meets to discuss the academic performance of first-year students. Coursework grades and laboratory rotation evaluations are used to assess student performance. Students are expected to have an overall GPA of at least 3.0, and rotation evaluations of “meets expectations” or “exceeds expectations” (scale = Exceeds Expectations/Meets Expectations/Needs Improvement/Unacceptable) for lab rotation performance. Those students with a GPA less than 3.0 and/or those who have received a grade of ‘C’ in any course may be dropped from the program. Alternatively, the student may be permitted to undergo a first-year examination (discussed in detail below). Students must receive a grade of “Pass” on this exam to remain in the program. At the conclusion of the first academic year, a summary of student performance and recommendations of the Graduate Studies Committee are presented to the Department Faculty by the Director of Graduate Studies. Students who have successfully completed their first year of studies receive a letter from the Director of Graduate Studies indicating admittance into the Doctoral Program in Pharmacology and Physiology. The Director of Graduate Studies meets individually with those students who did not meet the performance criteria in order to convey performance deficiencies and concerns of the faculty and discuss remediation.

First-year Examination

Students receiving a "C" in a course and/or having an overall grade point average of less than 3.0 after the first year are required to take the first-year exam. The purpose of the exam is to evaluate a student’s critical thinking skills in both written and oral formats, in order to identify those students who appear capable of completing all requirements for the doctoral program. The subject of the first-year exam is a recent article from the literature. Faculty members from the Department of Pharmacology and Physiology submit recent articles to the Director of Graduate Studies. A group of papers that align with the background and interests of the student is assembled by the Graduate Studies Committee. Students taking this exam meet with the Director of Graduate Studies, who reviews the instructions for completing the exam and explains the expectations for passing the exam to the student(s). Written instructions and expectations are provided to those students and faculty participating in the exam. Students are
not allowed to retake this exam. Failure results in termination from the program. Students who pass the examination receive verbal feedback on their performance immediately after the exam.

Annual Assessments

Following successful completion of the Qualifying Examination, students are expected to meet with their thesis advisory committee at least once yearly. During these meetings, the committee will discuss the student’s progress and clarify research problems. A written report of the student’s progress must be approved by the committee and then submitted to the Director of Graduate Studies and Senior Associate Dean for Graduate Studies. The form for this report can be found on the Graduate forms website: [http://www.urmc.rochester.edu/education/graduate/home/forms.cfm](http://www.urmc.rochester.edu/education/graduate/home/forms.cfm) (Evaluation-Annual). The annual committee meeting is typically done in conjunction with the student’s seminar. Prior to the committee meeting, students will work with their research advisor(s) to fill out the annual progress report and then distribute the report to committee members. Students who receive an overall performance evaluation of ‘good’, ‘fair’, or ‘poor’ (scale = poor/fair/good/very good/excellent/outstanding) will be asked to schedule bi-annual committee meetings to provide more feedback to the student. The Director of Graduate Studies will meet with students who receive a grade of ‘fair’ or ‘poor’ and their advisor to discuss potential ways to improve performance.

E. Departmental Seminars and Lectures: Attendance at all Department of Pharmacology and Physiology seminars and lectures is required until the requirements for the Ph.D. are completed. Each student is also required to formally enroll in PHP 502 each semester through their years of graduate study; however, a total of 4 credits are required. The student must present a seminar in this series at least 4 times prior to graduation. Seminar topics may consist of research areas in pharmacology and physiology, and dissertation progress reports. Topics will be chosen by the course director or by the student with approval of the course director. Students are encouraged to attend research seminars of local and visiting scientists
hosted by other departments. In addition, students are strongly encouraged to join one of several journal clubs run by faculty within the department.

Second-year students will present two seminars during the year – one in the fall and one in the spring. In the fall semester, second-year students will present a literature review of his/her choice. During the spring semester, students will present a research/literature seminar designed to incorporate some of their preliminary laboratory research in conjunction with relevant recent literature. During the third year of graduate work, a seminar is delivered in conjunction with the Qualifying Examination and is the only seminar required for the year. During years following the Qualifying Examination, an open oral research seminar (i.e. progress report) will be delivered in conjunction with the required yearly Thesis Advisory Committee meetings.

F. Advising and Committees:

Department Graduate Studies Committee

The Graduate Committee of the Department of Pharmacology and Physiology consists of the Director of Graduate Studies and typically four to five other faculty members who hold either primary or secondary appointments in the Department of Pharmacology and Physiology. This committee is responsible for administering the PhD programs, setting program requirements and policies, and monitoring student progress. The Graduate Committee reviews and approves students’ thesis advisory committees. The committee also considers petitions for graduate course transfers, graduate course selection, and exemptions to requirements and policies.

Thesis Advisor

Faculty members at the University holding primary or secondary appointments in Pharmacology and Physiology, as well as faculty members of the Aab Cardiovascular Research Institute may serve as a Ph.D. thesis advisor to graduate students in the Pharmacology and Physiology programs. A thesis advisor should be selected by June 1 of the first academic year. Selection of the Thesis Advisor requires approval by the Director of Graduate Studies in
Pharmacology and Physiology. Expectations of graduate students and of thesis advisors can be found at: http://www.urmc.rochester.edu/education/graduate/home/forms.cfm.

*Thesis Advisory Committee*

The thesis advisory committee performs several functions during the student’s time at the University. It serves as the basis for the qualifying examination committee, reviews the student’s progress on an annual basis, provides advice during the development and progression of the research project, and serves (along with an appointed Chair) as the examination committee for the thesis defense. The Thesis Advisory Committee should be consulted during conception of the thesis problem, execution of the thesis research, and the writing of the thesis. A faculty member does not need to be performing similar scientific research to be a valuable committee member. Often, those with peripheral knowledge of the student’s research area can see important avenues of study because of their different perspectives.

Students are expected to assemble their thesis advisory committee by the end of their second academic year. Students, after consultation with their faculty advisor, should submit the list of prospective committee members to the Director of Graduate Studies in Pharmacology and Physiology for approval. The Department of Pharmacology and Physiology requires that the thesis advisory committee be composed of three faculty members in addition to the student’s thesis advisor, for a total of four committee members. The University requires that the final thesis committee be composed of at least three faculty members (including the student’s advisor) - two faculty members with primary appointments in Pharmacology and Physiology and one faculty member with a primary appointment in another department. Therefore, to satisfy both requirements...

... if the student’s thesis advisor holds a primary appointment in Pharmacology or Physiology, the student should chose one more primary faculty for the committee to satisfy the requirements of the Dean’s office. The third member should hold a primary appointment in another department. The fourth committee member can hold either a primary or secondary appointment in Pharmacology and Physiology.
...if the student’s thesis advisor does not have a primary appointment in Pharmacology and Physiology, the student should select two committee members with primary appointments in this department. The fourth committee member should have a primary appointment in another department.

Committee Meetings

Students are strongly encouraged to meet with their thesis advisory committee prior to scheduling their Qualifying Exam. During this meeting, the student and committee members should discuss the student’s emerging research proposal. Once the student has successfully completed the Qualifying Examination, the Thesis Advisory Committee must convene at least once yearly during the remainder of the student’s tenure. During these meetings, the committee will discuss the student’s progress and clarify research problems. A written report of the student’s progress must be submitted to the Senior Associate Dean for Graduate Studies, after approval by the committee and Director of Graduate Studies, by June 1 of each academic year. If the annual progress report is not submitted by this deadline, stipend funding may be terminated. Students can obtain the “Evaluation-Annual” Progress Form at: http://urmc.rochester.edu/education/graduate/home/forms.cfm. At any time, the student and his/her thesis advisor may petition the Director of Graduate Studies and the Graduate Studies Committee to alter the composition of the Thesis Advisory Committee in order to reflect changing needs of the student’s research project.

G. Qualifying Examination: The Director of Graduate Studies meets with second-year students to provide students with the rules and expectations of the qualifying examination. A written summary of rules and expectations will be provided at the meeting. The Qualifying Examination may be scheduled as early as the spring of the second year of study, but must be completed no later than October 1st of the third academic year. An examination grade of “Fail” is recorded for those students who have not taken the exam by the deadline. Whether the student is permitted to take the exam at a later date is left to the discretion of the Graduate Studies Committee. A second failing grade results in termination from the program.
The Qualifying Examination is administered by members of the student’s Thesis Advisory Committee, plus two additional faculty members appointed by the Director of Graduate Studies. The appointed faculty members serve for the Qualifying Examination only, and are not permanent members of the student’s Thesis Advisory Committee. Students must schedule the exam at least one month prior to the actual date of the exam and inform both the Director of Graduate Studies and the Graduate Studies Coordinator of the date, time, and location of the exam. The exam consists of an "open" seminar, followed by a "closed" session, during which time the student is questioned by committee members. The closed portion of the exam typically lasts between two and three hours. The thesis advisor is not present during the closed examination.

The student will submit the research proposal (ten-page maximum) in the NIH grant-proposal format to all members of the Qualifying Examination committee at least ten full workdays prior to the examination. Failure to distribute the written document by the deadline, without prior approval from the Graduate Studies Committee, will result in cancellation of both the examination and seminar, and the exam will be recorded as ‘Fail’. The student will be given an opportunity to retake the exam once. Details of the format of the written portion of the exam are listed below. Failure to follow the formatting guidelines will result in the proposal being returned to the student and may result in a recorded grade of “Fail” for the exam.

**Format Specifications**

Students must use a standard NIH-style format for their proposal consisting of 1) Specific Aims; 2) Research Strategy (Significance, Innovation, and Approach) and 3) References. References are not included in the 10-page limit.

**Font:**

- Use an Arial or Helvetica typeface and a font size of 11 points or larger. A symbol font may be used to insert Greek letters or special characters; the font size requirement still applies.
- Type density, including characters and spaces must be no more than 15 characters per inch.
- Type may be no more than 6 lines per inch
- Print (including figure axes and legends) must be clear and legible.
Page Size and Margins

- Use standard size (8 ½” x 11”) sheets of paper
- Use at least one-half inch margins (top, bottom, left, and right) for all pages.
- Use single column format
- The proposal must be single-sided and single-spaced.
- Number pages consecutively. Do not use suffixes (e.g. 5a, 5b, etc). Do not include unnumbered pages.

The aim of the research proposal/qualifying examination is to assess the student’s general knowledge of the broad aspects of pharmacology and physiology and to test the student’s ability to apply this knowledge to the solution of research problems. Students are expected to propose a logical series of experiments designed to test a stated hypothesis and to defend their proposed ideas and approaches. The examination is not intended to be an abridged thesis defense, and therefore, limited preliminary data is required. Students must deliver a ~45 minute open proposal seminar prior to the closed examination. During this seminar, students should clearly state the hypothesis to be tested by the specific aims of the proposed project, provide justification for the research through consideration of published literature and/or preliminary data, and clearly outline the proposed line of experiments and anticipated results. Students should make every attempt to schedule their open seminar during the Student Colloquium Series (PHP 502). However, in some instances scheduling constraints may require the open seminar and exam to be scheduled at an alternate time. During the closed examination, students will be evaluated by their ability to satisfactorily answer questions raised by committee members that focus primarily on the following issues:

- Does the proposed research project address a valid and important scientific question?
- Has a central hypothesis been clearly stated? Is the hypothesis supported by published literature and/or preliminary data?
- Does the student have a broad and firmly based knowledge of the literature related to the area of research?
- Do the proposed methods appropriately address the hypothesis? Are the questions likely to be answered by the proposed approach?
• Are the proposed methods feasible? Does the student understand the limitations of the proposed techniques and possible technical obstacles? Does the student have alternate approaches in mind?
• Can the student clearly describe the predicted results and competently interpret the multiple possible outcomes of the experiments?
• Is it likely that the project could be completed within the requisite time frame?
• Is the scientific significance/importance of the question clearly stated? Is the relevance of this information to human health/disease clearly expressed?

If a student fails the examination, he/she may be given an opportunity to retake the exam once. However, students failing to complete the Qualifying Examination prior to Dec. 1st of their third year of study may jeopardize their opportunity to retake the exam. Given scheduling constraints, students should allow plenty of time to arrange with their Qualifying Examination Committee the date, time, and location of the Qualifying Examination. In addition, the student must submit two forms (available from the Departmental graduate coordinator) along with an Abstract and Title Page to the Senior Associate Dean for Graduate studies requesting that the examination be scheduled. This form must be sent no later than ten working days before the scheduled examination.

H. The Remaining Years: The remaining years of graduate study are spent on full-time research developing the research project that will be described in the Ph. D. thesis. The research advisor and thesis advisory committee play key roles during these years. The Senior Associate Dean for Graduate Studies and the Department of Pharmacology and Physiology require an annual meeting of the thesis advisory committee to discuss research progress. In conjunction with the yearly thesis advisory committee meetings, an open oral research seminar is expected. Typically, students schedule the annual meeting of their advisory committee to follow their research seminar. The completed annual progress report (signed by all committee members) should be submitted after this meeting. Students are encouraged to work closely with their thesis advisor to submit a predoctoral grant application in year 3 or 4. Students are expected to submit at least one first author peer-reviewed manuscript for publication before their doctoral defense.
I. Teaching: Students will have the opportunity to assist in Departmental organized laboratory exercises and problem-based learning sessions conducted as part of the Medical Education curriculum.

5. Thesis Preparation and Defense

A. Thesis Format: After the student's Thesis Advisory Committee and advisor have approved the completion of the thesis research, the appropriate form should be signed and delivered to the Departmental graduate coordinator. When the student is ready to write the thesis, he or she should go to the following website to print out a copy of the booklet “The Preparation of Doctoral Theses, A Manual for Graduate Students” - [http://www.rochester.edu/theses](http://www.rochester.edu/theses). This booklet outlines the University's requirements for format, documentation, and the physical form of the thesis. The student must prepare the thesis to meet the requirements set forth in this booklet. A copy of the Thesis Defense Timetable, which outlines University deadlines for registering a doctoral thesis, is included in the appendix of this Graduate Student Handbook.

Students should consult with their advisor prior to writing the thesis to reach an agreement about the format and content of the thesis. The advisor has the ultimate responsibility and authority to determine the format of the student’s thesis.

B. Registration of the Ph.D. Thesis and Final Oral Examination:

1. Arrange with the Dissertation Advisory Committee for the date, time, and place of the thesis defense. Notify the Departmental graduate coordinator of the date of the defense at least six weeks in advance.

2. The Departmental graduate coordinator will certify to the Senior Associate Dean for Graduate Studies that all requirements have been fulfilled (i.e., that an official undergraduate transcript is on file, that any name changes are on record (a copy of a marriage certificate, if it effects a change in name, may be needed, etc.).
3. **At least 28 full working days prior to the defense**, students must provide the Departmental graduate coordinator the following information for the forms below, which the graduate coordinator will complete:

a) *Ph.D. Advisor Form:* signed by the thesis advisor that states approval to register the thesis.

b) *Program Statement on Completion of Ph.D. requirements:* signed by the program director, that certifies that the student has completed all departmental requirements for the Ph.D. degree.

c) *Appointment Form for PhD Final Oral Examination:* to request assignment of an examination date by the Senior Associate Dean for Graduate Studies, signed by the department Chair.

d) *Program of Study for the Degree of Doctor of Philosophy in the Biomedical Sciences:* signed by the thesis advisor and department Chair, that lists all of the courses that the student has taken.

e) *Ph.D. Defense Committee E-mail Addresses*

(f) A copy of the thesis abstract.

(g) A copy of the title page.

Once your paperwork is submitted, you will receive an e-mail from the Registrar, Linda Lipani, to arrange an appointment with you to register your thesis. At least 18 full working days must elapse between the registration date and the actual date of defense. You will meet with the Registrar for approximately 5-10 minutes and, thereafter, you will leave your thesis for the Dean’s review. Once the Dean’s review is complete (generally 1-2 days), the Registrar will contact you to pick up the thesis for delivery to the Office of the University Dean for Graduate Studies, at Simon Hall on River Campus.

Once your thesis is registered, the student must deliver copies of the dissertation to the Thesis Advisory Committee no later than **two weeks before the defense date**. (*Student must contact the Departmental graduate coordinator before making copies of your theses so that copy charges are made to the correct account.*)

C. **Final Oral Examination:** The Final Oral Examination will be taken after completion of all other requirements for the degree, but not earlier than six months after passing the
cumulative and oral qualifying examinations. The examination consists of two parts: the first part is a public seminar that describes the work presented in the dissertation. The second part of the examination takes place immediately after the seminar and after all questions have been satisfactorily answered. The student will then meet privately with the Dissertation Advisory Committee to defend the dissertation.

After a successful defense, the student must make the corrections requested by the Examining Committee. A final signed form from the student’s advisor indicating that all of the changes have been made will be submitted to the Graduate Dean.

Once all corrections/revisions are completed, all PhD students must attach a pdf of their final abstract (350 words or less) and attach a pdf of their final dissertation to the UR ProQuest site (http://www.etdadmin.com/rochester). You will receive instructions for the ProQuest publishing process from the Chair of your defense.

After your final thesis is submitted to ProQuest, you can make three additional copies (again, students must contact the Departmental graduate coordinator before making copies of your theses so that copy charges are made to the correct account.) and give to the program graduate coordinator who will have hard cover bound copies made - one for the student, one for your advisor, and one for our archives. This is a courtesy paid for by the Department of Pharmacology and Physiology.

Note: Please be sure that the departmental graduate coordinator receives a copy of any correspondence between your advisor and the Senior Associate Dean for Graduate Studies Office that concerns your qualifying examinations and thesis registration. It is important that accurate records be kept within the department on the status of each student.

6. General Policies

A. Advisor's Responsibilities: Advisors are expected to meet regularly with trainees to assess their academic and research progress. The advisor should set reasonable expectations for performance in the laboratory, should assist the student in gaining access to needed
equipment and facilities, and should discuss potential or actual problems with the
Departmental Graduate Studies Committee. A more detailed description of the advisor’s
responsibilities can be found at the University’s Graduate Education website in a document
entitled “Expectations of Research Advisors.”
(http://www.urmc.rochester.edu/education/graduate/trainee-handbook/policies-
benefits/documents/expectations-research-advisors.pdf)

B. **Student's Responsibilities:** Students are expected to comply with departmental and
graduate school regulations concerning deadlines and the convening of dissertation advisory
committee meetings, to meet the academic performance expectations of the University, to
attend all departmental seminars, and to pursue their thesis research vigorously. All research
laboratories require that students maintain up-to-date records of their experimental work. The
research notebooks are the property of the student’s advisor. A more detailed description of
the student’s responsibilities can be found at the University’s Graduate Education website in a
document entitled “Expectations of Graduate Students.”
(http://www.urmc.rochester.edu/education/graduate/trainee-handbook/policies-
benefits/documents/expectations-graduate-students.pdf)

In addition, the document, *"Regulations and University Policies Concerning Graduate
Studies"*, contains more detailed information than is provided in this handbook, and students
are expected to be thoroughly familiar with these regulations. This Bulletin is available from
the Departmental graduate coordinator and is also available on the Graduate Education
website. (http://www.cc.rochester.edu/GradBulletin/PDFbulletin/Regulations10-12.pdf)

C. **Right of Petition:** Students have the right to petition the Departmental Graduate
Studies Committee to make changes in their program or to deviate from the guidelines
contained in this handbook.

D. **Vacations/Holidays:** Graduate students are expected to engage in full-time study
and research. NIH guidelines and official University of Rochester policy provides graduate
students with 2 weeks (10 business days) of vacation per year, as well as fixed University holidays. Students are not permitted to take more than two weeks of vacation at any one time. Any student requesting an exception to this policy must submit a written request to both the Director of Graduate Studies and the Senior Associate Dean for Graduate Studies. In all cases, the student's advisor or the Director of Graduate Studies (for students whose advisor is unavailable) should be consulted about planned vacations. Students are also entitled to official University holidays and a reasonable amount of sick days.

E. **Supplies and Photocopying:** In general, students will use research supplies available in the advisor's laboratory. All purchases must be approved by the research advisor. Photocopying is charged to the laboratory's copy card. If the student does not have access to a card or if the student is required to copy course material, a copy card is available in the Pharmacology and Physiology Department Office.

G. **Telephones:** The University does not allow personal long-distance phone calls to be made from the office or the laboratory. There is no mechanism for an individual to be charged for the calls or to reimburse accounts.

7. **Program for Masters Degree in Pharmacology or Physiology**

A. **General:**
   (1) All “required courses” as outlined for the Ph.D. program in Section 4C.
   (2) Four credits of seminar (PHP 502).
   (3) A minimum of 30 hours of graduate credit.

B. **Plan A:**
   (1) 6 additional credit hours of research credit.
   (2) Preparation of a dissertation based in part on original material that displays thorough acquaintance with a limited subject.
(3) Successful completion of a final oral examination that focuses on the thesis defense, but may include examination of general competency in pharmacology or physiology.

C. **Plan B:**
   (1) 6 additional credit hours of elective A/E course credit from the list outlined for the Ph.D. program in Section 4C.
   (2) Completion of the written examination requirement, which will be satisfied by the preparation of the Master's Essay that presents a critical review of a topic of current pharmacologic or physiologic relevance. Maximum length of 5 pages excluding references.
   (3) Successful completion of a comprehensive oral examination in pharmacology and physiology. The Ph.D. oral qualifying examination will also fulfill this requirement.

8. **M.D./Ph.D. Combined Degree Program**

   During their second year of study, M.D./Ph.D. students should discuss entry into the Ph.D. program with the Director of Graduate Studies of the Department of Pharmacology and Physiology. The Ph.D. portion of their combined degree program will begin after successful completion of the first two years of the Double-Helix Curriculum. M.D./Ph.D. students should expect to successfully complete 2-3 laboratory research rotations, at least one with a primary faculty member in the Department of Pharmacology and Physiology, during the first two years of the Double-Helix Curriculum.

   The Ph.D. portion of the M.D./Ph.D. program will build on previous background acquired in the Medical School curriculum. Because of this, certain course requirements of the traditional Ph.D. track outlined above will be waived and advanced courses may be substituted to provide depth in an area of specialization. M.D. / Ph.D. students are granted 30 credits toward the 96 credit requirement for the Ph.D. on the basis of their basic science courses in the medical curriculum. Students who consider that their background may permit exemption from
other core curriculum courses in Pharmacology and Physiology should request such an exemption. Each M.D./Ph.D. student must complete at least one of the following three Core Courses:

1) IND 408 Biochemistry (5 CR)
2) IND 409 Cell Biology (4 CR), or
3) IND 410 Molecular Biology (4 CR).

M.D. / Ph.D. students must also complete each of the following additional courses:

1) IND/PHP 447 Signal Transduction (4 CR),
2) PHP 502 Seminar (4 semesters) (1 CR), and
3) IND 501 Ethics and Professional Integrity (1 CR).

Finally, M.D./Ph.D. students must complete an additional 4 CR of upper-level A/E credit selected from the recommended courses listed in Section 4C above.

M.D. / Ph.D. students must also successfully complete the Departmental Qualifying Examination by October 1 of their 4th year of study in the M.D./Ph.D. program (as described in Section 4F above) and then meet annually with their Thesis Advisory Committee thereafter. During these meetings, the committee will discuss the student’s progress, clarify research problems, and outline priorities of future research directions. Thesis preparation and defense requirements are the same as those listed in Section 5 above.

9. **Ph.D. Degree Program for Post-M.D. Students in the Training Anesthesiologists as Physician Scientists Program (TAPS)**

It is possible to obtain Ph.D. training after obtaining the M.D. degree. The Department of Anesthesiology coordinates and supports a graduate research training program that leads to a Ph.D. degree in a basic science, and the Department of Pharmacology and Physiology participates in this program. Anesthesiology residents or fellows in the TAPS program can use credits obtained during medical school towards the course requirements of the Ph.D. degree as defined above. The program for training is individualized for the student depending on their
background and previous experience. Thus the specific course requirements are defined during the application process. Once accepted, students usually rotate through 3 laboratories before selecting an advisor.

Participants will be allowed to complete the requirements for residency or fellowship while working on the Ph.D. degree and would also be permitted to work one day per week clinically once they have finished their clinical training.