



**COLLEGE OF PHARMACY  
PHARMACEUTICAL SCIENCES**

UNIVERSITY OF MICHIGAN

---

**Graduate Student Handbook for  
the Interdepartmental Graduate  
Program in Pharmaceutical Sciences**

**Message from the Chair**

Dear Incoming Students:

Congratulations on joining our Michigan PharmSci family!

It is my sincere hope that your time with us will become a rich and memorable one in your life as you work to receive your Ph.D. in the Pharmaceutical Sciences at the University of Michigan. Our goal for you as future Ph.D. graduates is to become strong independent scientists with a solid pharmaceutical background that future employers have come to know and expect of our graduates. In pursuing your degree with us, you have become part of an exceptionally large and diverse network of pharmaceutical scientists across the globe who share common scientific goals and values. Graduate education can be a transformational experience and a time in your life where you are likely to experience exceptional personal and professional growth. The University of Michigan is a tremendous environment with rich resources both inside and out of our department. During your time with us, I urge you to seek out and discover the University, as you become a part of it. We are here to support you and please reach out to us if you are in need. On behalf of the department and the college, I am so happy to welcome you and wish you the best of luck in your studies here.

Best wishes,



Anna Schwendeman  
Chair, Pharmaceutical Sciences

## **Program Overview**

Welcome to the Pharmaceutical Sciences Department! This handbook is designed to give new and existing PharmSci PhD students a brief history and overview of the department at the University of Michigan with important guidelines and resources for successfully completing the Pharmaceutical Sciences PhD program.

Pharmaceutical Sciences is a dynamic and interdisciplinary field that aims to integrate fundamental principles of chemistry, engineering, biochemistry, and biology to understand how to optimize delivery of drugs to the body and translate this integrated understanding into new and improved therapies for human disease. At the University of Michigan College of Pharmacy, our internationally recognized PharmSci faculty contribute to the field through inquiry into the underlying mechanisms of drug interactions with the human body and development of advanced synthetic or biologically derived materials that can modulate these interactions in pursuit of better and safer therapies and drug products.

Students in our department learn the common language of Pharmaceutical Sciences through the rigorous core coursework in pharmaceutics, materials chemistry, drug transport, pharmacokinetics & pharmacodynamics and drug delivery systems. In addition, we support individualized student development by tailoring elective courses in the curriculum to specific student interests in cell and molecular biology, synthetic and macromolecular chemistry, chemical and biomedical engineering, materials science, physiology and pharmacology. Armed with a strong, interest-tailored foundation in basic and applied sciences, our students are well positioned to become an integral part of our explorations and our discoveries.

A variety of sub-specializations may be chosen during the pursuit of a Ph.D. in Pharmaceutical Sciences. For example:

- Chemical and physical integrity of drugs and dosage forms;
- Pharmacokinetics and pharmacodynamics of drugs;
- Mechanisms of how drugs cross membranes and barriers; and controlled release of drugs
- Quantitative relationships between chemical (e.g., stability) and physical (e.g., solubility) behaviors of drugs and their chemical structures.
- Nanotechnology and materials-drug biointerfaces
- Pulmonary delivery
- Antibody engineering and antibody-drug conjugates
- Delivery of biologics and immunologic approaches
- Regulatory science

The Department of Pharmaceutical Sciences provides:

- World-Class facilities and faculty
- A strong research environment and outstanding scientific atmosphere
- Research opportunities at the forefront of modern Pharmaceutical Sciences
- Excellent balance between the biomolecular and chemical sciences
- Competitive graduate student stipends
- Excellent career opportunities and advancement
- Major pharmaceutical and biotechnology industries, academic institutions and government agencies highly and consistently recruit our graduate students.

**Program Administration**

Department Chair	Anna Schwendeman	<a href="mailto:annaschw@umich.edu">annaschw@umich.edu</a>
Department Grad Chair	Julian Zhu	<a href="mailto:guizhiz@umich.edu">guizhiz@umich.edu</a>
Executive Secretary	Ambreen Mooraj	<a href="mailto:amooraj@umich.edu">amooraj@umich.edu</a>
College:		
Associate Dean	Karen Farris	<a href="mailto:kfarris@umich.edu">kfarris@umich.edu</a>
Rackham Resolution Officer	Assistant Dean Mark Nelson	<a href="mailto:mnelson@umich.edu">mnelson@umich.edu</a>
Student Affairs Program Managers:		
Professional Development	Antoinette Hopper	<a href="mailto:acast@umich.edu">acast@umich.edu</a>
Student Affairs and Admissions	Sneha Strodel	<a href="mailto:snehar@umich.edu">snehar@umich.edu</a>
Student Financial Support	Eileen Brussolo	<a href="mailto:efc@umich.edu">efc@umich.edu</a>

**Pharmaceutical Sciences Program Faculty****Ashlee Brunaugh, Pharm.D./Ph.D.**

Inhaled therapeutics

Mycobacterial diseases/Inflammation/lung microbiome

**Kyung-Dall Lee, Ph.D.**

Intracellular delivery Vaccine delivery (Master's only)

**Brandon Bordeau, Ph.D.**

Developing and evaluating antibody-based therapies

**Gergely Lautner, Ph.D.**

Bioanalytical chemistry Nitric oxide delivery

**Wei Cheng, Ph.D.**

Vaccines, B-cell immunology, single-particle and single-molecule analytical techniques

**James Moon, Ph.D.**

Nanomedicine

Vaccine and immunotherapy



**Gus Rosania, Ph.D.**  
Microscopic transport properties



**Pete Tessier, Ph.D.**  
Biologics delivery Antibody engineering



**Anna Schwendeman, Ph.D.**  
Nanomedicine  
Biosimilars



**Connie Wu, Ph.D.**  
Nanotechnology Advanced protein detection (Life Sciences Institute)



**Steven Schwendeman, Ph.D.**  
Biomacromolecule delivery Long-acting  
injectable depots



**Julian Zhu, Ph.D.**  
Nucleic acid therapeutics  
Drug / vaccine delivery



**Duxin Sun, Ph.D.**  
Pharmacokinetics Nanomedicine/cancer stem  
cells

## **Funding**

Throughout the first 5 years of the Ph.D., students will be supported by the College of Pharmacy and their Ph.D. mentor through a combination of fellowships, teaching, staff, or research assistantships, and/or training grants. Support includes payment of full tuition for fall and winter terms, an annual stipend, and health insurance which includes medical and dental coverage. Students who have their own external funding, or who receive funding from an external source during their time in the program, are required to share the details of their support package with the College of Pharmacy. To ensure that all graduate students receive no less than the College's current support package, the College will supplement a student's external award to cover any funding gaps between the external award and the College's current support package. If the external award provides full support, equivalent to the current graduate student support package, no additional College support will be provided. All external awards are reviewed on a case-by-case basis.

Students will be supported through completion of the Ph.D. program requirements provided they are making satisfactory progress towards the completion of the degree. Satisfactory progress includes passing core courses with a grade of B or better, maintaining at least a B average in coursework, a commitment to performing research year-round (12 months), advancing to candidacy within two years in the program, satisfactory performance during annual research updates during candidacy, and graduation before/early in your 5th year in the program.

For students whose Ph.D. studies extend beyond the 5th year, their Ph.D. mentor must contact the Department Chair describing their support plan for the student and completion plan for meeting all Ph.D. degree requirements. The Associate Dean for Graduate Studies must also approve any College funding beyond the 7th year.

If you have questions regarding your financial support, contact Eileen Brussolo at [efc@med.umich.edu](mailto:efc@med.umich.edu) or call (734) 615-3259.

## **First-Year Graduate Students**

**First Year Advising.** New graduate students are assigned an academic advisor for their first year in the program. Typically, the first-year advisor is the Graduate Chair. The role of the first-year advisor is to help students with course selection and other aspects of the first year.

**Student Support.** One of the most important areas is providing accommodations in the classroom and the lab for students with physical and mental disabilities. To assist any graduate students with disabilities, Pharmaceutical Sciences and the College of Pharmacy will partner with U-M Services for Students with Disabilities (<https://ssd.umich.edu>) and Rackham Graduate School (<https://rackham.umich.edu/rackham-life/students-with-disabilities/>) to implement disability accommodations and services. Students may contact the Student Affairs Program Manager for Student Affairs and Admissions for information about campus resources and to request an accommodation. Examples of reasonable accommodations include, but are not limited to note taking services, captioning, interpreter services, and adjusting time limits on exams.

**Responsible Conduct of Research.** The Rackham Graduate School requires training in the responsible conduct of research and scholarship to achieve candidacy. As such, enrollment in and completion of Med Chem 660 is required for all first-year graduate students entering the College of Pharmacy (Pharmaceutical Sciences, Medicinal Chemistry, and Clinical Pharmacy and Translational Sciences). The course was designed to satisfy the requirements of government and national funding agencies for a standard course in the responsible conduct of research and scholarship in the biomedical sciences. The course has also been designed to bring a cross-section of the entire research community of the College of Pharmacy together to foster a better understanding of the contribution of each discipline in the overall bench-to-bedside efforts of drug discovery and patient care. This course meets once a month in the early evening for the entire school year (8 classes); dinner and drinks will be provided. Details about the requirements and procedures for this course can be found in the course syllabus.

## **Guide to Graduate Student requirements, grades, credits, and academic standing**

This document provides a summary of the requirements that must be fulfilled to earn the Ph.D. degree in Pharmaceutical Sciences and the timeline for meeting these requirements.

The major PharmSci milestones that all students must complete are:

Coursework (see Curriculum Guide below)

(Minimum cumulative GPA of at least “B” in all required courses.)

Research rotations, selection of PhD advisor

Preliminary examination (dissertation proposal examination) and advancement to candidacy

Dissemination of your research at department seminar and scientific conferences

Journal Publications

PhD Thesis Dissertations (written) and Defense (oral)

## **Individual Development Plan and Mentoring Agreement**

The College of Pharmacy requires the use of Individual Development Plans between Ph.D. students and their faculty mentors. Individual Development Plans facilitate the process of defining, recording, and tracking progress made in satisfying program requirements; completing near-term research and dissertation projects; and achieving longer-term education, research, and career goals. The College of Pharmacy also requires the use of Mentoring Agreements between Ph.D. students and their faculty mentors to ensure that mentoring relationships are set up for success. More information can be found from Rackham’s Faculty Committee on Mentoring (MORE) (<https://rackham.umich.edu/faculty-and-staff/resources-for-directors/mentoring/>).

Students are required to complete their Individual Development Plan and Mentoring Agreement online each year by April 30 via the Ph.D. Student Individual Development Plan Interface (<https://pharmacy.umich.edu/mycop/idp>). Faculty will then review the student’s past work and achievements and mentoring agreement in May to provide feedback to the student and finalize their annual mentoring agreement with the student.

**All Students.** The COP IDP online electronic documentation system will be used to document your academic and professional progress throughout the program. During your first Term (CP1 Fall for PhD, P2 Fall for PharmD/PhD) you will participate in the COP Graduate Program Professional Development Program, during which you will complete your professional goals assessment and create a professional CV. Thereafter, the IDP online program will be used to align expectations and evaluations of students, and maintain your current CV. You are expected to upload your CV every April. These expectations will include your mentored research as well as generation of scientific products and professional development. Setting goals with timelines will help to ensure your progress in the program, and you are expected to meet the timelines agreed upon by you and your advisor or committee. The IDP has two main components, a Mentor Agreement for the upcoming year and a Mentor Evaluation of the previous year.

**Mentor Agreement.** When the student selects their advisor (CP1 Winter for PhD or P2 Fall for PharmD/PhD), and every April afterward, the student will draft a Mentor Agreement. The Mentor Agreement describes the student’s and advisor’s expectations for the coming year in regard to scientific (e.g., abstracts, conferences, publications, grants) and professional (e.g., workshops, teaching, internships) development, and student-advisor communication (e.g., meetings, emails). The advisor will review, edit, and sign the Mentor Agreement in May of each year. Students and PhD advisors should discuss and resolve any differences by the end of this process.

**Mentor Evaluation.** During April of each year, the student will complete a reflection of their progress and accomplishments during the preceding year, including whether they completed all programmatic requirements and achieved the goals described in the Mentor Agreement. During May of each year, concurrent with completing their annual evaluation (FED), the advisor will review the student’s evaluation and provide their own evaluation.

**Department Evaluation.** Each summer the PharmSci faculty will review each student’s progress, including their Mentor Evaluation and completion of all programmatic requirements. The DGP will complete a program evaluation and provide written feedback regarding student’s progress within the IDP system. The information in your IDP and

your current CV will be reviewed by the Director of Grad Program (DPG) and faculty each summer to ensure records are clear and expectations are being met. A written evaluation of each student's progress will be documented in the IDP by the DGP and provided to each student. Concerns that arise about the quality of performance and/or the time course of activities will be addressed proactively, in collaboration with you, your advisor, selected dissertation committee members and the DGP.

### **Internships**

Students are allowed to participate in internships during their PhD candidacy years ONLY if approved by their PhD advisor. Internships may delay the student's PhD progress, which may affect student funding and time to graduation. Students on unpaid internships will receive their usual stipend and health benefits from COP. Students on paid internships will receive supplemental support from the COP such that their total payment is equal to their typical stipend and includes benefits. Students on paid internships that exceed their stipend will receive only the internship payment in full.

### **PhD Curriculum Guide**

The PhD curriculum in Pharmaceutical Sciences is designed to provide a comprehensive education in the field, emphasizing drug development, delivery, and analysis. The program is divided into four main components: Required Intradepartmental Courses (10 credits), Required Ethics/Seminar (5 credits), Required Intradepartmental Elective (at least 6 credits), Core/Prerequisite Courses (16 credits – some could be waived, expectation of ~ 9 credits), and Extradepartmental Courses (9 credits – could be reduced if large pre-requisite load). **A total of 39 credit hours course is required to complete curriculum.**

#### **Intradepartmental Courses – Required to complete (10 credit hours):**

Pharmacokinetics - PharmSci 700 (2 cr) | Fall (Even years) – Dr. B. Bordeau  
 Equilibria & Dosage Forms - PharmSci 701 (2 cr) | Fall (Odd years) – Dr. J. Zhu  
 Biopharmaceutics - PharmSci 702 (2 cr) | Fall (Even years) – Dr. A. Brunaugh  
 Mass Transport & Chemical Kinetics - PharmSci 703 (2 cr) | Fall (Odd years) – Dr. S. Schwendeman  
 Analytical Methods in Drug Delivery - PharmSci 704 (2 cr) | Fall (Odd years) – Dr. W. Cheng

#### **Ethics and Seminar – Required to complete (5 credit hours):**

Students are also required to take MedChem 660 (0.5 cr) for their first two semesters  
 PharmSci 838 (1 cr) for their first four semesters.

#### **Intradepartmental Electives – Required to complete (at least 6 credit hours):**

Nanotechnology - PharmSci 705 (2 cr) | Winter\* (Odd years) – Dr. J. Moon  
 Biologics - PharmSci 706 (2 cr) | Fall (Even years) – Dr. A. Schwendeman  
 Cellular Drug Transport - PharmSci 710 (2 cr) | Winter (Even years) – Dr. G. Rosania  
 Pharmaceutical Engineering - PharmSci 717 (3 cr) | Winter – Dr. P. Tessier  
 Advanced Pharmacokinetics - PharmSci 760 (3 cr) | Winter (Odd years) – Dr. D. Sun

\* PharmSci 705 will not be offered in Winter 2025

#### **Core/pre-requisite Courses (~9 credits) (may petition waiver if these courses have been taken in your previous studies):**

Courses may be waived for students who have completed equivalent coursework in their previous studies. If prerequisite/core courses are taken during the graduate study and exceed 9 credit hours, the extradepartmental course requirement will be reduced accordingly (e.g., if 12 credits taken in the courses below during graduate study the extradepartmental requirement would be decreased by 3 credits resulting in a 6 credit extradepartmental requirement, see below).

#### **Core Biosciences. Complete at least two of the following (6 -7 credit hours):**

Quantitative Principles of Pharmacology - Pharmacol 601† (3 cr) | Fall



Systems and Integrative Physiology - Physiol 510 (4 cr) | Winter  
Cell Biology - CDB 530 (3 cr) | Fall  
Molecular Genetics - Humgen 541 (3 cr) | Fall

Statistics. Complete one of the following (3 credits):

Appl Biostatistics BIOSTAT 521 | Fall (3 cr) | Fall  
Introduction to Probability & Statistics - Stats 412 (3 cr) | Fall, Winter

Differential Equations. Complete the following (4 credits):

Mathematical Principles - PharmSci 580 (4 cr) | Fall

Physical Chemistry. Complete one of the following (3 credits):

Biophysical Chemistry I - Chem 453 (3 cr) | Fall  
Chem 461- Physical Chemistry I - Chem 461 (3 cr) | Fall

**Extrdepartmental Electives (~9 credits). Complete of the following (to reach 39 credits):**

Medicinal chemistry 534 (3 cr)  
Medicinal chemistry 532 (3 cr)  
Medicinal chemistry 533 ((3 cr)  
Pharm 604 (1 cr)  
Pharmacology 502 (2 cr)  
Physiology 601 (3 cr)  
Biochemistry 550 (3 cr)  
Cancer biology 553(3 cr)  
Cancer biology 554 (3 cr)  
Microbiology 640 (3 cr)  
Other classes that would augment student PhD training in Chemistry, Engineering, Biological Sciences graduate coursework.

**Additional Degree Requirements**

Medicinal Chemistry 660: Responsible Conduct of Research and Scholarship in Pharmaceutical Sciences (RCRS). This course is REQUIRED for ALL graduate students entering the College of Pharmacy (this includes Medicinal Chemistry, Pharmaceutical Sciences and Clinical Pharmacy) and is designed to satisfy the requirement of many government and national funding agencies for a standard course in the responsible conduct of research and scholarship in the biomedical sciences. The course is designed to bring the entire research community of the College of Pharmacy together to foster a better understanding of the contribution of each discipline in the overall bench to bedside efforts of drug discovery and patient care. If the student has attended a graduate program where the student completed an equivalent ethics course the student may ask to waive this course requirement.

**Research Rotations and Faculty-Student Matching**

ALL students are expected to complete three research rotations. Rotations are from the following

Rotation 1: Oct 1 – Nov 30  
Rotation 2: Dec 1 – Feb 15  
Rotation 3: Feb 16 – April 15

Students are expected to meet with sufficient faculty members to identify their first rotation lab by Oct 1.

Students ARE REQUIRED to visit with EACH faculty member on the Rotation Handout to meet them and to discuss the faculty members' research by Nov 30 to identify their 2nd and 3rd rotation labs.

Please inform Department Secretary by Oct 1 the first rotation lab, and hand in the Rotation Handout by Nov 30 with

faculty signatures and informing the 2nd and 3rd rotation labs.

When choosing the rotation lab please speak with the faculty member to discuss faculty and student expectations of the rotation.

Firm commitments prior to April 1st of the matching year between advisor and student regarding student- faculty matching is strongly discouraged unless special arrangements are made in consultation with the department.

Student-faculty matching will take place between April 16-April 30. Students normally begin working in their matched PhD advisor's laboratory immediately thereafter.

If you have any questions please speak to Graduate Chair, Department Chair or Department Secretary in the Department office.

### **Pharmaceutical Sciences Seminar**

The Pharmaceutical Sciences seminars are held on Wednesdays, weekly at 4:00pm. As indicated above, students must register and attend PharmSci seminars the first two years. In subsequent years attendance is required.

Third year seminar. Students will present a public seminar on their research project, encompassing background, goals, progress to date, and plans for the future in the third year. The first seminar is 30 min long, but it could be a full 60 min long seminar if the student and advisor wish it. The student's advisor will help guide him/her in the preparation of this presentation.

Final year seminar. Students will present a full seminar in their last year based on their dissertation research. In special cases where delays have arisen in the research this seminar may be delayed to the sixth year. This seminar is 60 min long. The student's advisor will guide him/her in the preparation of this presentation.

#### Seminar cancellation policy

The date for student seminar should be determined at least one month before the semester starts. This date should be agreed upon by both the student and the advisor.

Cancellation of the seminar is allowed for medically emergent situations, in which the presenting student is involved, up to the day and time when the seminar class is scheduled.

For all other cancellations: the student must submit a written request, agreed upon by the advisor, to the department office at least one month before the scheduled seminar time. In this request, please state the reasons for cancellation, which is subject for approval by the department.

### **Outside Activities**

Students are encouraged to make the most of the university during their graduate studies, although developing into independent research is the focus of our graduate program. At times some of these activities, if time-intensive, may significantly distract the student from their research focus. Examples of the latter include additional master's degrees (e.g., in statistics or biomedical engineering), certificate programs, serving as a key AAPS chapter officer, and outside committee work. Some students may also consider additional jobs to augment their stipend. A discussion with advisor is required before student takes on significant commitments.

As described above, in general internships or study at collaborator's labs are also encouraged by the department and many students do go on internships. Students should keep in mind that the college and the PhD advisor have a significant investment graduate studies by providing mentorship time and funding for fellowships, GSIs, lab resources, and GSRA's. Therefore, for significant outside activities, similarly as described above, the student should discuss up front with their PhD advisor (e.g., in the Mentoring Plan) to develop an agreement on time outside the lab before engaging in any significant outside activity.

## **Teaching as Graduate Student Instructor**

Although our program emphasizes research training of our students, we recognize the need to support the teaching mission of the College. Therefore, all students are encouraged to serve as a graduate student instructor (GSI) for at least one term during the course of their graduate training. Typically, students may serve as a GSI one term or more after their first year in the program. Serving as GSI also can be affected the level of research funding of the PhD advisor.

For more formal training on teaching, interested students are encouraged to participate in the UM “Preparing Future Faculty” program. In collaboration with Rackham Graduate School, the UM Center for Research on Learning and Teaching (CRLT) offers seminars and symposia to help graduate students prepare for their first faculty jobs. Topics include preparing for the job market, learning about current issues in higher education, tenure and faculty work life, and effective teaching for a diverse student body. The CRLT also hosts an annual conference on “Preparing Future Faculty”. Topics covered have included: Getting Started with your CV; Negotiating an Academic Job Offer; Developing your Teaching Philosophy; Practicing Interviews; Starting and Running a Research Lab; Dual Career Issues; and Faculty Work-Life Balance. One aspect of this program that a number of our students have taken advantage of is the UM Graduate Teaching Certificate, which provides graduate students with orientation, exposure, mentorship and experience in graduate level teaching in a month-long short course of study and “hands-on” experience.

## **Preliminary Examination and Advancement to Candidacy**

Preliminary committees should have at least three regular members of the Graduate Faculty, including at least two members of the Pharmaceutical Sciences faculty (with the student’s research advisor serving as Chair). While the presence of an outside member is desirable, it is not required.

Preliminary examinations, which consist of a written research proposal and oral presentation, should take place by the end of the second academic year of study in early September. The proposal should contain the specific aims or goals of the research project, appropriate background information to support these objectives, future studies to be performed and methodology used to perform them should be described in sufficient detail to convince the committee that the student is ready to pursue his/her research project. The proposal should be written in NIH R21 format (~ 7 pages). The advisor will guide the student in establishing a hypothesis and specific aims of the research. The research proposal should be distributed to committee members at least 7 days prior to the oral presentation.

The primary objective is to evaluate whether or not the student can critically think and present a well- developed research proposal. The student’s experimental data should be presented at a subsequent time during the “Research Update Meetings”. In most cases students pursue the proposal described in the preliminary examination. However, there is no requirement that this be the case, and sometimes initial research ideas do not work out and students and advisors will need to shift the research goals.

The “Course Work Requirement” form should be completed and distributed to all members of the preliminary committee prior to examination. This form should also be given to Department secretary (2002 Pharmacy) who will submit your information online for your “Recommendation for Candidacy”.

The candidacy meeting will take the form of an oral presentation and defense of the prelim research proposal. The student will prepare slides describing background and rationale and/or hypothesis for the research, specific aims and proposed studies/methodologies to be used (usually a PowerPoint presentation) but will not be expected to rely entirely on visual aids to answer the questions put forth by the committee. The student should prepare an oral presentation of about 45 minutes. Given interruptions for questions and answers, it is expected that the exam will take no more than 2 hours.

Before the meeting the student is asked to leave the room so that the committee can discuss logistics of the preliminary exam and the pre-candidate. Immediately following the meeting, the pre-candidate is asked to leave the room a second time and the committee determines whether or not to recommend advancement to candidacy. The

committee's evaluation will be documented on the Prelim/Research Update Form. The recommendation is then shared with the student directly after the exam and submitted to the PharmSci office on the Prelim Form and is kept in the student's file.

The Candidacy Committee Chair shall be responsible for moderating the pre-candidacy meeting and preparing and submitting the Prelim Form. In the event that the committee deems a student's performance unsatisfactory, the student may be granted a second attempt at the exam. In this case, this attempt must be made during or before the Fall term of the third year.

### **Thesis Committee Formation/Research Update Meetings**

Within roughly SIX months after being admitted to candidacy and passing the preliminary examination, a PhD dissertation committee should be formed.

Research updates, which include an oral presentation and a written report and/or copy of presentation materials, will be held after the preliminary examination normally on a yearly basis unless more frequent as indicated by PhD advisor or dissertation committee. Graduate students may also request more frequent update meetings and should contact their PhD advisor or committee members with this request. Update meetings are required to be held once per year after the students' prelim exam. In special cases, the research update meeting can be delayed upon approval by the PhD advisor and the department office (to be communicated by email). The research update meeting is the time at which the student is evaluated with respect to his/her progress toward completing the research project and dissertation. The committee is usually very helpful to provide suggestions on how to keep the research on track and to prioritize the most significant research questions to focus on. Research update meetings are evaluated by the Dissertation Committee. The hardcopy of report and/or any presentation materials should be distributed to committee members at least 7 days prior to the oral presentation unless permission is granted by the Dissertation Committee members for another arrangement.

A written evaluation (less than one page) and completed PhD outcomes table will be provided to the student by his/her research committee, and a copy placed in the departmental file, within one week of the research update meeting. The written evaluation will also indicate the following consensus opinion of the committee: Pass, Pass w/Conditions, No Pass. Note that in unusual circumstances where the student does not pass the Research Update Meeting, the student may be placed on poor academic standing, and may be asked to leave the program.

### **Research Publications**

The student is required to have at least **ONE first-authored peer-reviewed research article ACCEPTED** by a reputable journal before defending their PhD dissertation. The candidate should also have at least **ONE additional research manuscript SUBMITTED**. Note that in unusual circumstances (because of patent applications or slow responses from PhD advisor, etc.) the publication requirement can be waived at the discretion of the PhD dissertation committee in consultation with the department office.

### **Post-Candidacy – Embedded Master's Degree**

An [Embedded Master's Degree](#) is a master's degree awarded "on-the-way" to a Ph.D. in the exact same program. An embedded master's is NOT required for completion of the Ph.D. degree. The decision to apply for an embedded master's rests with the student and is neither encouraged nor discouraged by the program. Upon advancement to candidacy, students may request to apply for an embedded masters. The student must notify the Pharmaceutical Sciences office that they wish to apply for an embedded master's degree. The office will process the request and then the student will receive notification from the department that they can log onto Wolverine Access Student Business and "Apply for Graduation."

### **PharmD/PhD Dual Degree Program**

This program is designed to streamline the process of working toward both the PharmD and PhD degrees at the University of Michigan. Some degree of overlap exists between the two programs and concurrent enrollment and the

substitution/waiver of select courses can streamline the process of obtaining both degrees. It is anticipated that at least one year can be eliminated from the time for the PhD degree by taking the coursework during the PharmD. More information on the [Dual program](#) is located on the College of Pharmacy website.

The student may apply to both programs concurrently and to the PhD program during their P1 year. If accepted, the student will be dual enrolled and will follow the PharmD/PhD curriculum below. Upon completion of the PharmD degree (e.g., the end of Yr. 4), the student will continue in the Pharmaceutical Sciences PhD program and will be eligible for support (just as any other PhD student).

### **Guidelines for Dissertation Committee**

It is recommended that the membership of the dissertation committee be submitted to the Graduate School for approval at the time of the first research update meeting. Please see the [Dissertation Timeline](#) for more information.

For dissertation committee purposes, "The Graduate Faculty" consists of persons who are tenure or tenure-track instructional faculty holding an "unmodified" (i.e., not visiting, adjunct, etc.) appointment at the University of Michigan as Professor, Associate Professor, or Assistant Professor with an earned Doctorate from an accredited institution. Dissertation committees must have at least four members, three of whom are members of the Graduate Faculty and two of whom are from the doctoral candidate's home program. Furthermore, each committee:

Must have a sole chair or two co-chairs.

Must have a cognate member who is familiar with the standards for doctoral research and holds at least a .50 appointment in a Rackham doctoral program, other than the student's home department/program (except IDP programs.)

May include a university faculty member who is not Graduate Faculty, a university staff member, or a qualified individual outside the University to provide expertise in the candidate's discipline. Please refer to [Guidelines for Dissertation Committee](#) for more information.

### **Post-Candidacy**

Embedded Master's Degree. An "embedded master's" is a Master's degree awarded "on-the-way" to a PhD in the exact same program. An embedded master's is NOT required for completion of the PhD degree. The decision to apply for an embedded master's rests with the student and is neither encouraged nor discouraged by the program. Upon advancement to candidacy, students may request to apply for an embedded Master's degree. The student must notify the Pharmaceutical Sciences office that they wish to apply for an embedded master's degree. The office will process the request and then the student will receive notification from the department that they can log onto Wolverine Access Student Business and "Apply for Graduation" (<http://www.rackham.umich.edu/downloads/oard-embedded-masters-tip-sheet.pdf>).

Establishing a Dissertation Committee. A dissertation committee consistent with Rackham guidelines must be proposed within two months of admission to candidacy and must be approved by the Pharmaceutical Sciences IDP Director. The dissertation committee is chosen by the student and their mentor after candidacy is achieved. (Please note that each faculty member must be asked to be on the student's committee, and they need to accept that role before the student can submit the OARD Dissertation Committee Worksheet to the Rackham Graduate School with the assistance of the department secretary.) The role of the dissertation committee is to help guide the student, keep the student on track towards completion, and provide assistance to the student in achieving their research goals. It is possible to change the composition of the dissertation committee after it has been formed, but this should be done only after very careful consideration and must be approved by the Pharmaceutical Sciences IDP Director. (One example of justification for a change in committee composition would be if the student's research focus has changed such that committee members with different expertise are needed.)

Third-Year Seminar. In each student's third year of studies, they will present a public seminar in the Pharmaceutical Sciences Seminar Program on their research project, encompassing background, goals, progress to date, and future

plans. The student's mentor will guide the student in the preparation of this presentation. The seminars will be held in the Winter term of the student's third year. The student's dissertation committee will meet to give the student feedback as soon as possible after the seminar, so all committee members should be present. The committee evaluation section of the Annual Dissertation Committee Meeting form should be submitted, filled out by the mentor, and reviewed with the student. Both the student and mentor sign the form and submit it to the Pharmaceutical Sciences office. Please see Appendix 4 for Instructions.

**Dissertation Committee Meetings.** Subsequent Dissertation Committee Meetings should be held annually in the fourth and subsequent years. The Dissertation Committee Meeting (DCM) Report Form is filled out in the Ph.D. Student Individual Development Plan Interface by the student and advisor prior to the meeting. After the meeting, the committee summary is added to the form by the student's faculty mentor. The faculty mentor meets with the student and reviews the committee feedback; the form is signed by both student and mentor and submitted to the Pharmaceutical Sciences office to be kept in the student's file.

**Expectations for Completion of Dissertation Research.** Graduate students are responsible for working toward completion of their PhD in a timely fashion. It is expected that graduate students will gain expertise in a particular area of Pharmaceutical Sciences and expand the knowledge of that field by discovering and pursuing a unique topic of scholarly research. As professionals-in-training, graduate students should learn how to impart disciplinary knowledge through appropriate forms of instruction and publication and how to apply that knowledge to particular scientific problems.

It is in the best interests of our students, their mentors, and the Pharmaceutical Sciences program that our students publish multiple, high-quality papers during their dissertation research. However, it is recognized that the appropriate number of publications per student tends to vary widely, largely due to the nature of the work being reported.

It is the expectation of the Pharmaceutical Sciences IDP that each student will have at least one accepted first-author research publication as well as one submitted first-author research publication prior to graduation. A role of the Dissertation Committee is to make the determination that the student has completed and published a sufficient body of research in appropriate journals to merit the PhD. This determination should be made at the student's data meeting. It is also preferred that each student attend at least one national or international conference and give a poster or talk at least once during the dissertation research. The Department of Pharmaceutical Sciences is usually able to provide assistance (see student travel policy) to help any Pharmaceutical Sciences student going to a meeting. It is understood that some students may be limited by finances, childcare, health, or other issues that preclude travel. Funding for student travel to conferences etc. may also be requested from Rackham, training grants (for trainees), and other UM programs (e.g., Women in Science and Engineering). There are also multiple opportunities for local conferences and symposia where our students can present posters and talks.

**Data Meeting.** Four to six months before the final defense, a Dissertation Committee meeting is held to discuss the data generated and to identify any required, final experiments. A Data Meeting Report Form (distinct from the DCM Form) is filled out by the mentor and a copy is submitted to the Pharmaceutical Sciences office and is kept in the student's file.

Note: In all cases above, both the student and the mentor should keep copies of the reports, the PowerPoint presentations, and the evaluation/feedback forms for their records.

**Dissertation Defense.** The defense includes a public seminar presentation, ideally included within the regularly scheduled Pharmaceutical Sciences seminar program. This public presentation is followed by a private session with the Dissertation Committee. The Dissertation Committee members are provided with copies of the dissertation at least 2 weeks prior to the defense. Please see the Rackham Website ([http://www.rackham.umich.edu/dissertation\\_information/](http://www.rackham.umich.edu/dissertation_information/)) for further administrative guidelines regarding the dissertation defense process and dissertation format instructions. The student is required to submit their digital dissertation as per Rackham's instructions. Refer to Rackham for post-defense requirement to complete the doctoral degree. Please see timeline [here](#).

### **Academic Probation and Dismissal Policies and Procedures**

Below are the links to the new Academic Probation and Dismissal Policies and Procedures.

Academic Probation and Dismissal Procedures:

[https://pharmacy.umich.edu/system/files/intranet/policy/Academic\\_Probation\\_and\\_Dismissal\\_Procedures\\_for\\_PhD%20Programs.pdf](https://pharmacy.umich.edu/system/files/intranet/policy/Academic_Probation_and_Dismissal_Procedures_for_PhD%20Programs.pdf)

Academic Probation and Dismissal Policy:

[https://pharmacy.umich.edu/system/files/intranet/policy/Deficiencies\\_for\\_Academic\\_Progress\\_and\\_Unsatisfactory\\_%20Academic\\_Standing%20Policy.pdf](https://pharmacy.umich.edu/system/files/intranet/policy/Deficiencies_for_Academic_Progress_and_Unsatisfactory_%20Academic_Standing%20Policy.pdf)