



# **PATHWAYS OF HUMAN DISEASE GRADUATE PROGRAM and Ph.D. in Pathology**

University of Rochester School of  
Medicine and Dentistry

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## PREFACE

This handbook is intended to outline the major features and policies of the Pathways of Human Disease Graduate Program and Ph.D. in Pathology. 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/> and in the *Student Handbook of the School of Medicine and Dentistry*. Copies can be obtained in the Offices for Graduate Studies of the School of Medicine and Dentistry. Policies continue to evolve in response to the changing needs of the graduate programs and the student body. It may be necessary to verify any important decisions or policies with the Co-Directors of the Pathways of Human Disease Graduate Program, Dr. Robert Mooney and Dr. Therese Wiedmer.

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## **I. PROGRAM PHILOSOPHY**

The Pathways of Human Disease Graduate Program (PWD) and Ph.D. in Pathology is a flexible, diverse program with multi-departmental character. It is designed for the student who is interested in applying the latest advances in cell biology, biochemistry and molecular biology to the understanding of human disease mechanisms. Students entering the Pathways of Human Disease Graduate Program will be prepared for successful, independent careers in research and teaching. Through coursework, seminars, and research experiences, the student is well-prepared to address the complex but rewarding problems in human disease in an academic, industrial or governmental setting.

The first year curriculum is designed to give trainees a strong foundation in biochemistry, cell biology, molecular biology/genetics and in fundamentals of pathobiology. The course requirements are common to most degree programs in the first year, however, and afford the student maximum flexibility, allowing transfer to another Ph.D. program within the Graduate School of the University of Rochester Medical Center. It is appreciated that some students would like to explore the many research areas available to them during the first year before making a final decision about the research area in which to pursue their thesis work.

## **II. PROGRAM ORGANIZATION**

The Pathways of Human Disease Graduate Program and Ph.D. in Pathology is a multidisciplinary program which is administered and supported by the Department of Pathology. However, the faculty of the PWD Program

represent at least 16 departments within the University of Rochester Medical Center, including Orthopaedics, Ophthalmology, Biomedical Genetics, Neuroscience, Medicine and Pediatrics to name a few. A primary or secondary faculty appointment in the Department of Pathology is not necessary to be an active PWD Graduate Program faculty member. Currently, 70% of faculty in the PWD Graduate Program do not have academic appointments in the Department of Pathology. This illustrates the diversity and multi-departmental character of this program. Faculty are accepted as Graduate Program faculty if they have the desire, experience, and time to train graduate students; have funding to support students; and have an active research lab that investigates human disease in its broadest sense.

### **III. CURRICULUM**

#### **A. Enrollment**

After successful completion of the first year of study, PWD students will follow a disease-oriented curriculum in elective studies and in advanced coursework during the second year. For those students who transfer into the PWD Program after the first year, they will enroll in PTH 509/510 and any other required Pathology courses in their second year. All students are also required to designate a thesis advisor after successful completion of three lab rotations, or June of the first year. The thesis advisor need not be a member of the PWD Graduate Program faculty, but must provide a strong training and educational environment. Admission will also be dependent on successful completion of coursework and a desire to pursue thesis research that has a relationship to human health and disease.

## B. Courses

**The following courses are required for a PhD degree in Pathology:**

		<u>Credits</u>
PTH 509	Pathways of Human Disease I	4
PTH 510	Pathways of Human Disease II	4
PTH 504	Current Topics in Experimental Pathology (Required every semester, except when writing thesis*)	1
IND 501	Ethics in Research	1
IND 408	Biochemistry	5
IND 409	Cell Biology	4
IND 410	Molecular Biology and Genetics	4
		<i>23 credits</i>

***ELECTIVES (two elective courses are required: one PTH, one non-PTH)***

### Recommended Elective Courses

PTH 507	Cancer Biology	4
PTH 593	Molecular Basis of Disease	3
IND 447	Signal Transduction	4
MBI 473	Immunology	3
STT 463	Introduction to Biostatistics	4

***Total Credits 29-31***

While two electives are required, students may take additional electives depending on the student's background, areas of demonstrated competence, and research interests. One of the two electives must be a PTH course and one must be a non-PTH course, unless waived by the Program Co-Directors.

## C. Student Seminar Series

Attendance at the Student Seminar Series (PTH 504, Wednesdays at 3:00) is mandatory for all students. \*Only students writing their thesis and defending are exempt from PTH 504 during that semester.

#### **D. Minimum Course Performance**

Any student who receives a “C” or an “E” for a course or research is considered to be on probation. If the student receives a second “C” or “E”, this grade is considered a failure. This unsatisfactory record will be reviewed by the Pathology Graduate Program Steering Committee. After review, the student may be dismissed from the program. Students encountering difficulties in coursework should seek advice from the Program Director and/or their thesis advisor as early as possible.

#### **E. Course Waivers & Transfers**

A student may request a waiver from taking one of the core courses in the curriculum based on prior coursework. An official form can be obtained from the Offices for Graduate Education for this request: *Petition for Course Waiver*. Critical requirements for approval are 1) course must be parallel to UR course and therefore a syllabus describing the course content must be provided by the student, 2) course must have been taken within 5 years of date of matriculation, and 3) grade of “B” or higher must have been earned. An interview with and approval signature of the director of the course being waived is required. Note that course credit is not transferred. Student must earn the full credit requirements for a degree. The student is expected to substitute either an advanced course in the same field or a graduate level course in another area of study.

Under very special conditions, a student may request a transfer of credit for a course taken at the University of Rochester before matriculation or in another graduate program. The course must be an integral part of the proposed program of study. An official *Petition for Transfer* form can be

obtained from the Offices for Graduate Education to request a course transfer. These transferred credits will appear on the student's transcript.

#### **F. Pathology Research Day**

Pathology Research Day takes place each year in early June and begins with a departmental Research Poster Session where all Pathology Graduate Students are required to present a poster. Competition for the five \$1000 Pathology Graduate Student Travel Awards (see below) takes place during this poster session. The day continues with a lecture by a distinguished scientist, and concludes with a celebratory end-of-year Awards Dinner.

#### **G. Pathology Graduate Student Awards**

The Awards presented to Pathology Graduate Students at this dinner are: Five Department of Pathology Graduate Student Travel Awards, Outstanding Academic Achievement by a First Year Student, Outstanding Contribution to the PhD Program by a Graduate Student, and Outstanding (first author) Publication within the past academic year.

#### **Department of Pathology Graduate Student Travel Awards**

##### Rules and Eligibility

The Department of Pathology has established five (5) \$1000 travel awards for graduate students. These will be awarded yearly. Awardees will be chosen from all current Pathways of Human Disease Graduate Program and Ph.D. in Pathology students who present a poster at the Pathology Research Day poster session. A committee of program faculty, chosen by the directors, will judge the posters and select the winners.

All graduate students are eligible for travel awards with the following limitations:

- 1) Travel awards must be used for scientific meetings in which the student presents a poster or oral presentation as first author.
- 2) A student is ineligible in the year following the awarding of a travel award.
- 3) No student can win more than twice.
- 4) A student is ineligible if a previously awarded travel award has not yet been used.
- 5) Travel awards must be used while the student is a member of the graduate program.
- 6) If a student completes the program before using the travel award, a small token of recognition from the medical center bookstore will be substituted (not to exceed \$75).

#### **IV. CHOICE OF RESEARCH ADVISOR**

Each student will complete a minimum of three laboratory rotations during the first year. These rotations provide the student the opportunity to work with a range of scientists in several research laboratories. The research scientist chosen for each rotation must be a tenure track faculty member with experience in training graduate students. The faculty member chosen as the thesis advisor must have sufficient funds to support the student and the student's thesis research. The faculty member must also have the time and commitment to the student's training and education. Exceptions can be made using the guidelines provided by the Offices for Graduate Education for mentor eligibility. (A non-tenure track faculty member can be an advisor only with approval of the Program Co-Directors and the faculty member's chairperson, along with the appointment of a co-advisor).

## V. ORAL QUALIFYING EXAMINATION PROCEDURES

### A. General Procedures

Upon completion of the coursework required by the PhD in Pathology (at least 30 credit hours of coursework and research rotations that include the required core courses, PTH 509/510 and the two electives), the student is eligible to take the Oral Qualifying Exam. The exam evaluates the student's understanding of basic principles, critical thinking, and his or her ability to synthesize and develop testable hypotheses. The student's principle objective is to propose and defend the components of the thesis that he/she intends to pursue as the PhD dissertation. The student will be responsible, however, for all material relevant to the graduate curriculum. Most students should plan to take this exam at the end of their second year, which provides at least one year of experience in their chosen lab and an opportunity to generate sufficient preliminary data to propose and defend a thesis proposal. All students **must** take their qualifying exam before the end of the first semester of the third year.

Paperwork for the Qualifying Exam must be turned in by the Program Coordinator to the Offices for Graduate Education at least 10 working days before the exam date. *The student should notify the Program Coordinator as soon as he/she begins to plan for the Qualifying Exam so that paperwork, including the proposal's title page and abstract, and room reservation are completed within deadline.*

### B. Written Proposal

In preparation for the Oral Qualifying Exam, the student writes a hypothesis-based research proposal in NIH grant format. Preliminary data and

experimental approaches are based on the student's progress to date in his or her chosen laboratory. There are no precise page requirements, but **25 pages is the upper limit**. However, the Specific Aims, Background and Significance, Preliminary Data, and Experimental Procedures cannot, in most cases, be adequately covered in less than 15 pages. *Copies of this document must be presented to each member of the Qualifying Exam Committee 2 weeks before the exam.* While the submitted proposal provides a valuable example of the student's comprehension of the scientific method and can be the basis for examination questions, the qualifying exam tests the full scope of the student's knowledge and reasoning skills.

### **C. The Oral Qualifying Exam Committee**

The Qualifying Exam Committee is composed of faculty chosen by the student with the assistance of their thesis advisor. A preliminary list of committee members must be approved by the Program Co-Directors *before* any faculty members are invited to participate on the committee. Once assembled, the committee must be formally approved by the Pathways of Human Disease Graduate Program Directors and the Offices for Graduate Education. The Qualifying Exam Committee must be composed of at least two faculty from within the Pathology Graduate Program and one faculty member from outside of the program, in addition to the thesis advisor. If an extra-departmental committee member from an institution other than the University of Rochester is desired, approval from the Senior Associate Dean for Graduate Education is required. The Committee membership must collectively provide both extensive experience with graduate student education and research expertise that complements an aspect of the thesis work. The committee must have more than one faculty member at the rank

of Associate Professor or higher. If a clinical faculty member (with no graduate student mentoring experience) is included to provide a clinical perspective on the project, that faculty member should not be counted as one of the required three committee members. Faculty who have frequent contact with the student's work and input into his or her progress are not an appropriate choice for this committee. The Qualifying Exam Committee provides an independent assessment of the student's performance and of the adequacy of the thesis proposal. The Qualifying Exam Committee subsequently becomes the student's official Thesis Committee that acts as an independent advisory committee for the student. The thesis advisor is required to attend the Qualifying Exam as an active participant. The Program Coordinator will work with the student when scheduling the exam and submitting the composition of the committee to the Offices for Graduate Education. Paperwork must be filed at least 10 full working days before the exam.

*It is important for the student to check the Academic Calendar (<http://www.urmc.rochester.edu/education/graduate/academic-calendar.cfm>) for any Qualifying Exams block-out dates before attempting to schedule an exam date with their committee*

#### **D. The Oral Qualifying Exam**

The exam will begin with a closed meeting of the Qualifying Exam Committee, without the student in the room, to review the student's academic record, research performance, and written proposal. The committee will also decide on the format of oral questioning of the student. The committee must agree that the student has the appropriate academic

preparation and the written proposal meets the departmental requirements before proceeding.

The student will then join the committee in the closed session. The student will present a 20-30 minute summary of his or her proposal using appropriate media. A public student seminar can substitute for this oral summary. The committee may question the student during the presentation or hold questions until the presentation is complete. This is predetermined by the committee. The committee will question the student to determine his or her breadth and depth of knowledge related to the research proposal. While the proposal serves as a focus for the oral exam, questions in other areas may be raised and the student should be prepared to answer questions of a more general scientific nature related to the proposal.

Following the oral exam, the Qualifying Exam Committee will request the student wait outside the room while they evaluate the student's performance. The committee will vote on the following options: 1) the student passes; 2) the student fails; 3) the student may pass contingent on meeting some further requirements set by the committee (e.g., rewriting a portion of the proposal and submitting it to the committee for approval; retake the oral exam; or take further coursework to correct a deficiency).

The Qualifying Exam Committee will notify the Offices for Graduate Education and the Pathology Graduate Program Office in writing of the outcome of the exam. If the student has passed, the Senior Associate Dean for Graduate Education will advance the student to the official status of Candidate for the PhD degree. In most cases, the student will also be

awarded a Master's Degree under Plan B on the way to earning the PhD. In the case of a contingent requirement, a second letter from the committee must be submitted when the student has accomplished the necessary requirements. For a student who has failed the exam, a second opportunity to sit for the Oral Qualifying Exam may be offered. This will be decided by the Pathways of Human Disease Graduate Program and Ph.D. in Pathology Steering Committee after reviewing the student's performance. If approved, this can be scheduled within 4 months, but no later than 9 months. A third opportunity can only be scheduled with the approval of the Senior Associate Dean for Graduate Education.

## **VI. THESIS ADVISORY COMMITTEE**

Once the Oral Qualifying Exam is passed, the Oral Qualifying Exam Committee assumes the role of Thesis Advisory Committee. In this capacity, the committee annually monitors the progress of the student relative to the research goals and specific aims detailed in the written thesis proposal or in subsequent revisions to the research goals that are presented to the committee.

### **A. Yearly Student Evaluations**

A yearly *Annual Evaluation of Graduate Student's Progress* form is required from each student in all Years except Year 1. Year 1 students must have written evaluations from each of their three rotation advisors using the *Lab Rotation Evaluation* form. These Progress Reports will cover the time period from July 1<sup>st</sup> to June 30<sup>th</sup>. All reports must be submitted to the Program Coordinator by June 30<sup>th</sup>. Students who have not yet formed a thesis committee must have the *Advisor Only Progress Report* form

completed by their thesis advisor. **All other students must have a yearly thesis committee meeting which is the basis for the written Progress Report.** Students completing their Qualifying Exam can have this Progress Report completed at the time of the exam to avoid a second committee meeting in that year.

It is the responsibility of the student to convene his or her Thesis Advisory Committee at least once per year. *The Program Coordinator should be notified of the committee meeting date prior to the meeting.*

The *Annual Evaluation of Graduate Student's Progress* form states that the committee has met, reviewed the student's progress, set future goals and directions, and agreed that the progress was acceptable. Any reservations or recommendations must also be included in this written evaluation. The form, signed by the student and each of the committee members, including the student's advisor, must be submitted to the Program Coordinator. If the thesis committee deems it necessary, it can meet with the student more frequently than once per year to monitor the student's progress and provide additional guidance to the student.

The Office of Graduate Education requires a copy of each student's yearly Progress Report. If a student does not submit a signed yearly Progress Report during the July 1<sup>st</sup> to June 30<sup>th</sup> period, a letter of explanation, signed by the thesis advisor and student, must be provided to the Senior Associate Dean for Graduate Education and to our PWD Graduate Program Co-Directors explaining the reason for the delay and providing a date for the committee meeting.

All University of Rochester School of Medicine and Dentistry graduate programs are strictly enforcing this student requirement. Some programs stop stipend payments on July 1<sup>st</sup> to any students who have not completed their yearly committee meeting and Progress Report. Everyone should take this requirement seriously.

## **VII. THESIS PREPARATION AND DEFENSE**

### **A. Preparation**

When the student's Thesis Advisory Committee and advisor have approved the completion of the thesis research, the student should inform the PWD Graduate Program Coordinator and obtain a copy of the booklet, *The Preparation of Doctoral Theses* (pdf at [www.rochester.edu/theses/](http://www.rochester.edu/theses/)). This booklet provides detailed instructions for preparation of the written thesis. The student must work with the thesis advisor to determine the content of the thesis. The advisor has the ultimate responsibility and authority to determine the content and format of the thesis. *Note: Verbatim substitution of multi-contributor manuscripts into the thesis in lieu of chapters is not acceptable. Each chapter must be written by the student and contain only data generated by the student unless clearly acknowledged in the affected figure or table.*

### **B. Registration of the Thesis**

At least 25 working days prior to the final examination, the paperwork relevant to the registration and scheduling of the thesis must be submitted to the Offices for Graduate Education. The PWD Program Coordinator will work with the student to complete this paperwork and to schedule the thesis defense. An Abstract and Title Page from the written thesis are needed at

this time. Note: the University does not allow a thesis registered later than 6 weeks before the end of the Spring semester to be defended until June. Once the paperwork has been submitted to OGE by the coordinator, the student schedules an appointment with the Registrar, Linda Lipani, in the Offices for Graduate Education. At this meeting, the student will officially register the thesis with *both* the Senior Associate Dean for Graduate Education and the University Dean for Graduate Studies. This official registration must be accomplished at least 18 working days before the date of the thesis examination. These deadline rules are different during the summer months. Therefore, check the Academic Calendar for Summer Thesis Examination registration instructions.

*It is important for the student to check the Academic Calendar (<http://www.urmc.rochester.edu/education/graduate/academic-calendar.cfm>) for any Final Thesis Examination block-out dates before attempting to schedule an exam date with their committee.*

### **C. Thesis Defense**

The Thesis Committee and the Chair, who is appointed by the Dean of Graduate Studies, must be given final copies of the written thesis 3 weeks before the thesis examination. The thesis examination consists of two parts: the first is a 1 hour public lecture that describes the work presented in the dissertation. After all questions from the lecture audience have been satisfactorily answered, the second part of the examination, a closed session, follows immediately. The student will meet with the Thesis Committee to officially defend the thesis.

## VIII. GENERAL POLICIES & INFORMATION

### A. Student Vacation Policy

Following the University's holiday schedule and NIH regulations, students will receive 2 weeks of vacation per year (July 1 to June 30). Many students are funded through NIH training grants or through their mentor's NIH grants. Having any other vacation policy would be in violation of NIH rules. The University of Rochester School of Medicine and Dentistry graduate students commit to 12 months of study and research per year, which means they do not follow the standard University break schedule.

To arrange vacation time, all students must receive permission from their advisor. *Students need to contact the Program Coordinator if they will be on vacation for 14 day or longer.* It is the student's obligation to **notify the Offices for Graduate Education to obtain the necessary approval for those vacations of 14 days or longer.** Any student who takes an unauthorized leave risks having his/her stipend terminated.

Program approval of vacation less than 14 days is automatic as long as the advisor has given permission. Therefore, vacations of less than 14 days need not be brought to the Program Coordinator's attention. It is understood that the judgment and flexibility of the advisor can be exercised. Circumstances such as family death, illness, or other emergency should be taken into consideration on a case-by-case basis.

## **B. Parental Leave**

Students may receive stipends for up to 30 calendar days of parental leave per year for the adoption or the birth of a child. Either parent is eligible for parental leave. The use of parental leave requires approval by the advisor.

## **C. Leave of Absence**

A student who has not completed all course and credit requirements for a degree may request a leave of absence from the program. Approval must be obtained from both the PWD Graduate program Co-Directors and the Offices for Graduate Education. The leave will ordinarily be limited to one year. Students must register for PTH 985--Leave of Absence--each semester and pay a small fee. Note that leave of absence does not count toward the degree time limit.

## **D. International Students**

The International Services Office (ISO), 209 Morey Hall (585-275-2866) provides information and services for all international students. Advisors are available to answer questions. This should be the first place to contact if there are any questions about immigration regulations and available resources for international students. All international students on any type of visa are urged to subscribe to the ISO Newsletter <http://www.iso.rochester.edu/news.htm> for updates on Immigration and Naturalization Service (INS) procedures.

### **E. Stipends**

All PhD students receive full tuition benefits and a stipend. For the 2009-2010 academic year, the stipend has been set at \$25,500 by the Offices for Graduate Education. Adjustment to the stipend level is considered on a yearly basis to allow for inflation and maintain University of Rochester program competitiveness. The Offices for Graduate Education funds student stipends for the first 15 months of a student's enrollment. At the end of this period, the student has chosen a PhD thesis research lab and the stipend is the responsibility of the mentor through extramural research funding or training grants.

### **F. Health Insurance**

Along with the stipend, full funding is provided for an individual health insurance policy that is administered through University Health Services (UHS). This insurance contribution can be applied to a family policy, though the student is responsible for the difference in premiums.