THE path
toward understanding
the fundamental basis of human disease

GRADUATE STUDENT HANDBOOK
2019–2020

EXPERIMENTAL PATHOLOGY GRADUATE PROGRAM
Department of Pathology
Yale School of Medicine
New Haven, CT
EXPERIMENTAL PATHOLOGY
GRADUATE STUDENT HANDBOOK

updated Fall 2019
Fields of Study
Fields include molecular and cellular basis of diseases, including cancer; biology, biochemistry, genetics, and pathology of molecules, cells, tissues, and organ systems, including plasma membrane dynamics, mitochondrial dysfunction, signal transduction, and response to stimuli of connective tissue; assembly of viruses and their interactions with animal cells; somatic cell genetics and birth defects; biology of endothelial cells; and computational and high-throughput approaches to understanding disease pathology.

Admissions Requirements
A strong background in basic sciences is recommended for program applicants, including biology, chemistry through organic and physical chemistry, mathematics through calculus, biochemistry, genetics, or immunology. GRE General Test or MCAT is optional.

To enter the Experimental Pathology Ph.D. program, students apply to an interest-based track, usually the Molecular Medicine, Pharmacology, and Physiology (MMPP) track within the interdepartmental graduate program of Biological and Biomedical Sciences (BBS).

Requirements for Completing the Ph.D. Program
• Grade of ‘Honors’ in at least two regular term courses by the end of 2nd year
• Completion of required coursework
• Satisfactory performance in the Qualifying Exam, as determined by the student’s Qualifying Committee
• Service as a Teaching Fellow in two courses
• Presentation of an acceptable research prospectus as determined by the student’s thesis committee
• Continuing progress in dissertation research as determined by Thesis Committee meetings which must be held at least once annually (after prospectus)
• Submission of a dissertation judged acceptable by the faculty of the Department.

Required Coursework for the Ph.D. Degree
At the completion of a course, students are normally assigned a grade of Honors, High Pass, Pass or Fail. Seminar and research courses are usually graded Satisfactory or Unsatisfactory. The Graduate School requires that Ph.D. students obtain a minimum of two grades of Honors in regular term courses by the end of the second year of study.
• PATH 620a/PATH622b: Research Rotations in Experimental Pathology
• (Students must do three laboratory rotations before selecting a lab)
• PATH 640a: Developing and Writing a Scientific Research Proposal
• PATH 650b: Cellular and Molecular Biology of Cancer
• PATH 660b: Responsible Conduct of Research
• PATH 679a/680b: Seminar in Molecular Medicine, Pharm., and Phys. (full year)
• PATH 690a: Molecular Mechanisms of Disease
• B&BS 503b: Responsible Conduct Refresher for 4th-year BBS Students (Spring)
• Two additional graduate level, one-term courses: can include courses in Pathology, Pharmacology, or Physiology and others with permission of the DGS. If there is any question if a certain course will be accepted as one of these electives, please consult the Registrar and DGS.

MD/PhD Students:
• PATH 620a/PATH622b: Two laboratory rotations
• PATH 640a: Developing and Writing a Scientific Research Proposal
• PATH 650b: Cellular and Molecular Biology of Cancer
• PATH 679a/680b: Seminar in Molecular Medicine, Pharmacology, & Physiology (full year)
• PATH 690a: Molecular Mechanisms of Disease
• B&BS 503b: Responsible Conduct of Research Refresher for 4th-year BBS Students
• Two additional graduate level, one-term courses: can include courses in biochemistry, genetics, immunology, cell biology, and pathology. These should be chosen in consultation with the Director of Graduate Studies (DGS), according to the student’s background and interest.

Joining a Lab for the Dissertation Research
The single most important decision made by a graduate student is the selection of a dissertation advisor and laboratory. The best way to assess a laboratory and one’s “fit” to it is to carry out a research rotation in that laboratory. Other useful sources of information are advanced students, the Director of Graduate Studies and faculty.

The DGS must approve the selection of a laboratory. The selection of a lab marks the assignment of a student from a track to an academic department. As for all scientists at Yale, students are encouraged to broaden their scientific knowledge and to attend activities that are relevant to their scientific interests.

Qualifying Examination
The qualifying examination takes place during the second year of the PhD program, normally in the Spring and comprises the following components:

Note: During the semester of their qualifying exam, students should sign up for QUAL 999, Preparing for Qualifying Exam.

1. PATH 640a: Developing and Writing a Scientific Research Proposal (Fall, Year 2)
This course is designed to prepare students to write a proposal on the topic of the student’s research. Throughout, students receive critical feedback from peers and professors, and will have a completed research proposal at the end of the course. This proposal serves as the foundation of the written portion of the qualifying exam (in the format of an NIH NRSA Research Strategy). It is important to add any new data between course completion and Qualifying Exam.
2. **Formation of the Qualifying Exam Committee (Fall, Year 2):**
   - Students should form their committees by November or December (before recess).
   - The qualifying committee consists of 3 faculty members. The student will read with 2 of these faculty individually, which forms the ‘reading period’ (#3 below). The reading period is two to three weeks on average.
   - The third faculty member will read the student’s updated proposal and give them feedback on their writing prior to the examination (#4 below).
   - At least one of the committee members must have a primary appointment in the Department of Pathology and serve as the Chair. In special cases, a student can alter the composition of their thesis committee with the approval of the Thesis advisor and the DGS. The thesis adviser is not on the exam committee.
   - Members of the exam committee should have expertise in areas chosen for reading.
   - Submit the names of the proposed thesis committee to the DGS for approval. When committee is confirmed, send email of committee members to Registrar.
   - Notify Registrar of Qualifying Exam date. You may schedule a room with any Administrative Assistant or the Registrar. You are responsible to contact ITS for equipment needs.

3. **Reading periods with two faculty members (Spring of Year 2):**
   - Two of the three committee members are advisors for the reading period and should have expertise on specific topics related to the research proposal.
   - During the reading period, the student and each committee member should together select primary scientific literature papers to read that are related to the grant proposal and topic of faculty expertise.
   - Students will then meet with these faculty individually to discuss the papers during the reading period. The number of papers discussed, and format of the discussion is at the discretion of the readers.

4. **Selection of a ‘writing advisor’ to serve as third qualifying committee member:**
   This faculty member will read the completed proposal and give the student feedback. This can be the same faculty member who gave the student feedback during the PATH 640 course.

5. **Completion of the oral qualifying examination (Spring of Year 2):**
   - The student must submit their written proposal to the Qualifying Exam Committee members at least one week prior to the exam.
   - The oral examination will focus on the student’s ability to present and defend the research proposal. The student should prepare a 30–40-minute presentation of the proposal, with visual aids. The committee can ask questions on topics presented in the proposal, as well as those covered during the reading period and general topics in experimental pathology covered in coursework.
   - Note: The actual presentation will take longer since exam committee faculty will interrupt with questions. Plan to schedule 1.5-2 hours for the exam.
   - Following completion of the examination, the student will be asked to leave the room for the committee to discuss the exam.
   - The examination committee chairperson will complete the [Qualifying Exam Report](#) and discuss with the student and committee upon return to the room. The student is
responsible for bringing this form to the meeting. The form should be submitted to the Registrar following the exam.

- Students can Pass, Conditional Pass, or Fail the Exam.
  
  **Conditional Pass:** The committee has the option of recommending an additional course of reading and/or written work. The DGS has final discretion in approving or modifying the recommendations of the committee.
  
  **Fail:** If the student does not pass the exam, they should schedule a meeting with the DGS and advisor to determine the next course of action.

**Formation of the Thesis Committee and Dissertation Research**

In year three, following successful completion of the qualifying examination, the student will constitute the Thesis Advisory Committee. This is an important body that helps each student navigate the goals of dissertation research. The function of this committee is to periodically review and evaluate progress, provide advice and expertise about the project, and certify when a student has completed sufficient work to begin writing the dissertation.

- The Thesis Committee has a minimum of three faculty members in addition to the thesis advisor.
- At least two members must have primary or secondary appointments in the Department of Pathology. The committee is chaired by a primary Pathology faculty member who is not the Thesis Advisor. In special cases, a student can alter the composition of their thesis committee with the approval of the Thesis advisor and DGS.
- Faculty members with expertise in the area of the dissertation research are particularly helpful and should be sought out as Thesis Committee members.
- Additional members may be added if deemed appropriate (and can be added throughout the course of the dissertation).
- The Thesis committee can be the same as the Qualifying Exam committee, however this is not required.
- The Thesis Committee is assembled by the student in consultation with the Thesis Advisor and approved by the DGS.

**Prospectus**

The First Thesis Committee Meeting consists of presentation and approval of the Thesis Prospectus. The student will prepare the written thesis prospectus:

- This document should be in the format of an **NRSA Research Plan:**
  
  A summary of background information in the field of interest,
  
  The specific questions to be answered
  
  Rationale for choosing those questions
  
  A detailed research plan for addressing those questions.
- The student should send the final prospectus to the thesis committee at least 1 week prior to the committee meeting.
- At the beginning of the meeting, faculty will excuse the student to discuss the proposal. The student will then proceed with a presentation of the prospectus, with visual aids.
- At the conclusion of the presentation, the student will be again excused for the faculty to discuss. The chair of the thesis committee (not the thesis advisor) will complete the
Thesis Committee Form. The student is responsible for bringing this form to the meeting and forwarding to the Registrar after the meeting.

- The student will be brought back in to go over feedback on the form, and the thesis advisor will be excused to give students a chance to privately discuss any additional questions with the committee.
- When the thesis prospectus is approved and student has passed the qualifying exam and all course requirements are completed, the student is automatically advanced to Ph.D. candidacy by the Graduate School, and the Registrar will complete an Admission to Candidacy Form.

Thesis Committee Meetings
Following approval of the prospectus, thesis committee meetings are required at least one once a year, at the discretion of the Committee and noted on the Thesis Committee Form. Students should prepare a brief report and send this to the committee at least one week before the meeting.

1. Once a meeting is scheduled, the student must advise the Registrar of the date.
2. At the committee meeting, the student should give a brief presentation, covering the following:
   - Data acquired since the last committee meeting
   - Plans for the next 12 months
   - The Committee can aid in interpreting the results, prioritizing experiments, and assessing whether the project is on track.
3. If a manuscript is in preparation, the student is encouraged to include an outline in the Annual Report. The outline could include:
   - A summary of the manuscript’s main points
   - A list of subtitled sections
   - A list of figures and tables, with brief descriptions of the data to be included in each.
   - It should be noted which experiments have been completed and which remain to be done.
4. If the student intends to graduate within 12 months, they should bring an outline of the thesis. This should include:
   - A list of chapters with a brief description of the information to be contained in each
   - Publications and/or papers in preparation should be mentioned.
5. Career development should be discussed at every Thesis Committee meeting (see below).
6. At the conclusion of the committee meeting, the student will be excused from the room for the committee to discuss. A Thesis Committee Form must be completed by the Chair of the Committee and returned to the student for submission to the Graduate Registrar. Once the student returns, the advisor will then be excused to give the student an opportunity to discuss their progress privately with the committee.

Career Development Plan
Students are encouraged to think about their career goals, how these goals can be achieved during their PhD, and how they can work with their mentor, DGS and graduate program to align expectations and meet these goals.
• Students should use myIDP to design their professional and career development plan.
• Students are encouraged to discuss their plan with their mentor every 6 months.
• Additional career development resources are available through the Yale Office of Career Strategy

Dissertation Progress Report
Following admission to candidacy, students are required to complete a Dissertation Progress Report annually. Students will receive an email reminding them of the deadline. Following completion of the report by the student, their thesis advisor will complete their portion of the report, and it will be sent to the DGS who will review. These remain on file at the Graduate School.

Teaching
All graduate students are required to teach the equivalent of two courses at the TF-10 level (10 hours per week), or one course at the TF-20 level (20 hours per week). These can be chosen from numerous lecture, laboratory and seminar courses offered at the undergraduate, graduate or medical school levels.

• Students generally teach in the 3rd year after they qualify. Students may not teach in the first year and is not recommended in the second year. If a student wants to teach in year two, they must ask for permission from their PI and have DGS approval.
• If students have a specific course they are interested in teaching, they should contact the course professor well ahead of the course beginning.
• In the early summer, the BBS office will notify all graduate students of the courses in which teaching fellows are needed in the upcoming academic year. Students should indicate their interest in such positions and their preference for specific courses by submitting the BBS teaching survey that is sent at that time.
• MD/PhD students are only required to TA one course (at the TF-10 level).
• Prior to the first semester of teaching, each student must attend Teaching-at-Yale Day: Preparation for all New Teaching Fellows at the beginning of each semester. Students are encouraged to take one or more of the short teaching courses and workshops offered by the Center for Teaching and Learning during the fall semester.
• Students may elect to teach beyond the two-semester requirement. Extra teaching should not take time away from thesis research. Permission must be obtained from both the Thesis Advisor and the DGS.
• Priority for teaching assignments is given to students needing to fulfill their teaching requirement. Students are not allowed to teach 2 full term courses in one semester.

Research-In-Progress (RIP) Talks
Beginning in their third year, students are required to present annually at the Research in Progress (RIP) talks. These are weekly seminars held during the academic year typically consisting of two, 30-minute presentations on the projects of graduate students, post-docs, and research scientists in the Pathology Department. Attendance at these lectures is strongly encouraged.
Preparing and Submitting the Dissertation

1. Students must receive approval from their thesis committee to begin writing the thesis. It may take a couple of months to write the dissertation, or less time for students who have published papers that will form the core of the dissertation.
   • The Experimental Pathology department strongly recommends that each student have at least a primary research manuscript in submission to a journal before the Committee gives permission to the student to write his or her dissertation.

2. The dissertation should describe the scholarly work of the student.
   • Results produced by collaborators should be excluded. If these results provide context for the student’s original work, they can be briefly described in the text (but not shown in Figures unless the student actively participated in producing these results), and the contribution should be properly acknowledged.
   • The student should draw his or her own illustrative diagrams rather than using or modifying published ones.
   • Note that the student must obtain permission from the publishers prior to reproducing published materials (even if it is from the student) in his or her dissertation.

3. Students should follow the following resources for preparing the dissertation:
   • Document formatting
   • Dissertation checklist

4. The student, in consultation with the Thesis Advisor, must identify three readers who will evaluate the dissertation. These readers do not need to be on the thesis committee.
   • At least two of the readers must hold ladder faculty positions at Yale.
   • One of these readers must have a Primary Appointment in Experimental Pathology and cannot be the student’s Thesis Advisor.
   • One of the readers may be from outside of the Yale Community, however, no outside reader is required.
   • The student should complete an Online Notification of Reader’s Form and submit it to the DGS electronically at least 4 weeks prior to the submission deadline.

5. The Graduate School requires one original unbound, printed copy of the thesis document with the dissertation checklist, including the degree petition form.
   • Submit your final paper copy (unbound copy) of your dissertation in addition to the required form listed on the to the GSAS Dissertation Office on or before the deadline. (October for December Graduation; March for May Graduation).
   • Complete the ProQuest Publication Agreement. Students are encouraged to review the entire agreement but are only required by the Graduate School to print and complete Section III (“Author Options & Signature) and the “Dissertation Submission Form.” The “Copyright Registration” and “Copy Order” forms are optional. Any forms you complete must accompany the dissertation manuscript in hard copy at the time of submission.
   • Based on the options you indicate within the publication agreement; your bursar account will be charged as follows. If you are no longer registered, payment may be made by check or money order payable to Yale University at the time of submission.
   • The GSAS Exit Survey and NSF Survey of Earned Doctorates are also required for submission of the dissertation, as indicated on the dissertation checklist.
• All forms and fees must be paid to the Dissertation Office at the time of submission. The Graduate School does not make any deadline exceptions.
• Email your dissertation in the form of a PDF to your departmental registrar either before or on the day you submit the final unbound paper copy and paperwork to the Dissertation Office and Barbara.Withington@yale.edu.
• The file should be saved as a PDF using the "reduced file size PDF" settings.
• The file should be named with your last name, first name, middle initial and your department with space between each. (i.e. Smith, John A Music Dept)

6. At the same time as submitting to the graduate school, the student should send the pdf file of the thesis to the readers, who are asked to judge the acceptability of the dissertation and to provide comments.
• Students (in consultation with their advisor) are expected to incorporate any additional changes required by the readers into the Graduate School's unbound copy.
• The student should be prepared to make any changes required by any of the readers in the final copies. Prior review by the thesis advisor and thesis committee makes revisions in the final, submitted version a rare exception. If necessary, however, revisions must be submitted to the Graduate School.

7. After all reader evaluation forms have been returned to the Graduate School and all requested changes to the dissertation have been made, the DGS, on behalf of the Experimental Pathology Faculty, will sign the form recommending award of the Ph.D. degree. Then the Graduate School Degree Committee and finally the Yale Corporation will vote to approve conferral of the degree.

Thesis Seminar
1. After the thesis committee has approved the writing of the thesis, the student selects a date for the thesis seminar in consultation with the Thesis Committee.
2. The Student is required to e-mail the title of the thesis and date/location of the seminar to the Graduate Registrar.
3. The seminar must be held in person on the Yale campus and open to the public with the entire Thesis Committee present.
4. The defense typically lasts 1 to 2 hours and starts with an introduction of the student by the Thesis Advisor, followed by a 45-55 min seminar by the student.
5. This is followed by a private meeting of the student by the Thesis Committee.

Probationary Status
Satisfactory progress means that the student has met all Graduate School and departmental requirements normally expected for each stage of the student’s program. In addition to satisfying these general Graduate School requirements, students must meet any additional requirements specified by their departments. Students who fail to make satisfactory progress may be placed on a probationary status pending satisfactory completion of requirements. Ph.D. students who have been admitted to candidacy must continue to demonstrate satisfactory progress toward the degree in the annual Dissertation Progress Report (DPR). Students who fail to meet departmental or Graduate School requirements by the designated deadlines, and students who have been admitted to candidacy who fail to submit the annual DPR, will be administratively withdrawn.
Students must register each term until the dissertation is submitted or until six years (twelve terms) of study have been completed.

Dissertation Completion Status
A doctoral student who is not eligible for full-time registration may request to enroll with the status “Dissertation Completion.” This status enables advanced students to maintain an active NetID in order to access electronic library resources and their Yale e-mail accounts while completing their dissertations under the supervision of a member of the Graduate School faculty.

Registration in Absentia
Ph.D. students whose program of study requires full-time dissertation research, full-time fieldwork, or full-time study at another academic institution outside the New Haven area may request to be registered in absentia. Such registration requires recommendation of the director of graduate studies. Forms for requesting registration in absentia may be obtained online at [http://gsas.yale.edu/forms](http://gsas.yale.edu/forms) and should be filed at least one month before the beginning of the term during which the student expects to be studying away from New Haven.

Students who are enrolled in Yale Health and are registering in absentia should consult the [Member Services Department](http://gsas.yale.edu/forms) at Yale Health about the policies governing coverage while they are away from New Haven.

Leave of Absence
Students who wish or need to interrupt their study temporarily may request a leave of absence. All leaves of absence must be approved by the appropriate associate dean on the recommendation of the department. Medical leaves also require the written recommendation of a Yale Health chief physician or their designee, as described below.

Department of Pathology Graduate Courses
*Denotes required coursework

*PATH 620a and 622b: Laboratory Rotations in Experimental Pathology
Themis Kyriakides
Laboratory rotations for first-year graduate students.

PATH 625a: Pathobiology of Neurodegeneration
Vincent Marchesi
This course will cover what we know about the causes of Alzheimer’s disease (AD) and other debilitating mental incapacities, their complications, and the rationale behind the treatments that are now available. Recent studies suggest that the incidence of dementia is declining, testimony to the idea that effective preventive measures could rescue large numbers of vulnerable people. The course explores in depth what these might be. The focus will be on the analysis of primary research data and is geared to the interests of students planning a career in brain-related research in academics or industry.
PATH 630b: Biomaterial-Tissue Interactions  
_Themis Kyriakides_  
The course addresses the interactions between tissues and biomaterials, with an emphasis on the importance of molecular- and cellular-level events in dictating the performance and longevity of clinically relevant devices. In addition, specific areas such as biomaterials for tissue engineering and the importance of stem/progenitor cells, and biomaterial-mediated gene and drug delivery are addressed.

*PATH 640a: Developing and Writing a Scientific Research Proposal  
_Katerina Politi, Jean Ju Chung_  
The course will cover the intricacies of scientific writing and guide students in the development of a scientific research proposal on the topic of their research. All elements of an NIH fellowship application will be covered, and eligible students will submit their applications for funding.

*PATH 650b: Cellular and Molecular Biology of Cancer  
_David Stern, Qin Yan_  
A comprehensive survey of cancer research from the cellular to the clinical level. The relation of cancer to intracellular and intercellular regulation of cell proliferation is emphasized, as are animal models for cancer research. Background in molecular genetics and cell biology is assumed. Open to advanced undergraduates with permission of the organizers.

*PATH 660b/C&MP 650b/PHAR 580b: The Responsible Conduct of Research  
_Barbara Ehrlich_  
Organized to foster discussion, the course is taught by faculty in the Pharmacology, Pathology, and Physiology departments and two or three senior graduate students. Each session is based on case studies from primary literature, reviews, and two texts: Francis Macrina’s _Scientific Integrity_ and Kathy Barker’s _At the Bench_. Each week, students are required to submit a reaction paper discussing the reading assignment. Students take turns leading the class discussion; a final short paper on a hot topic in bioethics is required.

PATH 670b: Pathobiology  
_S. David Hudnall, Jon Morrow, Jeffrey Sklar, Gilbert Moeckel, Anita Huttner_  
An introduction to human biology and disease as a manifestation of reaction to injury. Topics include organ structure and function, cell injury, circulatory and inflammatory responses, disordered physiology, and neoplasia.

*PATH 679a and 680b: Seminar in Molecular Medicine, Pharmacology and Physiology  
_Don Nguyen, Susumu Tomita_  
Readings and discussion on a diverse range of current topics in molecular medicine, pharmacology, and physiology. The class emphasizes analysis of primary research literature and development of presentation and writing skills. Contemporary articles are
assigned on a related topic every week, and a student leads discussion with input from faculty who are experts in the topic area. The overall goal is to cover a specific topic of medical relevance (e.g., cancer, neurodegeneration) from the perspective of three primary disciplines (i.e., physiology: normal function; pathology: abnormal function; and pharmacology: intervention).

**PATH 681a: Advanced Topics in Cancer Research**  
*Kurt Schalper*  
This advanced course focuses on readings and discussion on three or four major topics in cancer biology, such as targeted therapy, tumor immunology, tumor metabolism, and genomic evolution of cancer. For each topic, the class starts with an interactive lecture, followed by critical analysis of primary research literature. Recent research articles are assigned, and a student leads discussion with input from faculty who are experts in the topic area. **Prerequisite:** PATH 650 or permission of the instructor. Open to all Ph.D., M.D./Ph.D., and M.P.H. students and to advanced undergraduates at the discretion of the instructor.

**PATH 682b: Cancer Clinical Translation**  
*Samuel Katz*  
This course builds upon basic cancer biology knowledge to see the impact of scientific knowledge on real-world clinical oncology issues through didactic sessions, working tumor board attendance, and workshop discussions. The first half of the course emphasizes practical issues in moving research ideas into the clinic, design and execution of standard and novel forms of clinical trials, and statistical analysis of clinical trial data. The second half covers the perspectives of clinicians on the most important outstanding biological questions that should be addressed by cancer investigators. Class size is limited, with priority for Cancer Biology Training Program trainees. Advanced undergraduates or graduate students may be admitted with permission of the organizers.

*PATH 690a, Molecular Mechanisms of Disease*  
*Demetrios Braddock, Carlos Fernandez-Hernando*  
This course covers aspects of the fundamental molecular and cellular mechanisms underlying various human diseases. Many of the disorders discussed represent major forms of infectious, degenerative, vascular, neoplastic, and inflammatory disease. Additionally, certain rarer diseases that illustrate good models for investigation and/or application of basic biologic principles are covered in the course. The objective is to highlight advances in experimental and molecular medicine as they relate to understanding the pathogenesis of disease and the formulation of therapies.
## Appendix 1: Timeline of Experimental Pathology Requirements

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<th>Year One</th>
<th>FALL SEMESTER</th>
<th>SPRING SEMESTER</th>
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<td>PATH 620a/PATH622b: Research Rotations</td>
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<td>PATH 679a: Seminar- Molecular Medicine, Pharm., and Phys.</td>
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<td>PATH 690a: Molecular Mechanisms of Disease</td>
<td>PATH 660b: Responsible Conduct of Research</td>
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<td>Two additional graduate level, one-term courses (year one or two)</td>
<td>PATH 680b: Seminar in Molecular Medicine, Pharm., and Phys.</td>
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<td>Year Two</td>
<td>Choose a Qualifying Exam Committee</td>
<td>Qualifying Examination</td>
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<td></td>
<td>PATH 640a: Writing a Scientific Research Proposal</td>
<td>Sign up for QUAL 999: Preparing for Qualifying Exams</td>
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<td>The graduate school requires the completion of 2 Honors by the end of 2nd year.</td>
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<td>Year Three</td>
<td>Sign up for CAND 999: Prep: Admission to Candidacy</td>
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<td>Choose a thesis committee</td>
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<td>First Thesis Committee meeting and presentation of the Prospectus</td>
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<tr>
<td>Year Three &amp; Beyond</td>
<td>Teach for 2 semesters (one for MD/PhD)</td>
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<td>Full-time research</td>
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<td></td>
<td>Sign up for DISR 999: Dissertation Research in Residence each semester after prospectus is completed</td>
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<td>Annual thesis committee meeting</td>
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<td>B&amp;BS 503b: Responsible Conduct of Research in 4th year (Spring)</td>
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<td>Present Research in Progress talk annually</td>
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<td>Final Year</td>
<td>Finish up data collection, complete analysis and write up dissertation</td>
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<td></td>
<td>Hold seminar</td>
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<td></td>
<td>Submit Thesis to Graduate School by October (December Degree) or March (May degree)</td>
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