




**Pathology**

**and**

**Molecular Medicine**

**Graduate Student Handbook**

**2024-2025**



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**Director of Graduate Studies:** Themis Kyriakides  
**Graduate Registrar:** Marrisa DeLise

The Pathology and Molecular Medicine Graduate Program is committed to building and maintaining a supportive community in which students from diverse backgrounds and experiences are supported in their professional development and social and intellectual goals. We strive to create an inviting environment and institutional culture of inclusivity where every individual's unique and diverse characteristics are valued and respected. We hope that you will feel well integrated and at home.

### **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 Requirement**

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. To enter the Pathology and Molecular Medicine Ph.D. program, students apply to an interest-based track, usually the Translational, Molecular Medicine, Pharmacology, and Physiology (TMMPP) track within the interdepartmental graduate program of Biological and Biomedical Sciences (BBS). <https://medicine.yale.edu/bbs>. After successful completion of year one, BBS students will choose a department to join.

### **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.

## Requirements for Completing the Ph.D. Program

- All Requirements of the Graduate School of Arts and Sciences must be met including the Graduate School's two Honors Grade requirement by the end of the fourth term of full-time study.
- Students must maintain an overall High Pass average. Student progress toward these goals is reviewed at the end of the second term.
- Three Laboratory Rotations. (2 for MDPHD).
- Completion of required coursework.
- Satisfactory performance in Qualifying Exam, as determined by the student's Qualifying Committee.
- Serve as a Teaching Fellow in two courses (MDPhD one course) teaching requirement.
- Presentation of 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).
- Annual presentations for the Research in Progress Talks.
- Annual updates to Individual Development Plan.
- 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 assigned a grade of Honors, High Pass, Pass or Fail. Seminar and research courses are usually graded Satisfactory or Unsatisfactory.

- PATH 620/PATH622: Complete 3 Laboratory Rotations
- PATH 640: Developing and Writing a Scientific Research Proposal
- PATH 650: Biology of Cancer
- PATH 660: Responsible Conduct of Research (or equivalent/)
- PATH 679/680: Seminar in Molecular Medicine, Pharmacology & Physiology (Full year)
- PATH 690: Molecular Mechanisms of Disease.
- B&BS 503: Responsible Conduct Refresher for 4th-year BBS Students (Spring)
- Two additional graduate-level electives, which can include courses in biochemistry, genetics, immunology, cell biology, and pathology, to be chosen in consultation with the Director of Graduate Studies based on the student's background and interest. If there is any question if a certain course will be accepted as one of these electives, please consult the Registrar and DGS.

## Required Coursework for MD/PhD Students:

M.D./Ph.D. students must satisfy all the requirements listed above for the Ph.D. with the following modifications: Two laboratory rotations are required. Serve as a Teaching

Fellow for one term.

- Complete two Laboratory Rotations before joining lab
- PATH 640: Developing and Writing a Scientific Research Proposal
- PATH 650: Biology of Cancer (optional)
- PATH 660: Responsible Conduct of Research (equivalent with DGS Permission).
- PATH 690: Molecular Mechanisms of Disease (optional)
- B&BS 503: Responsible Conduct Refresher for 4th-year BBS Students (Spring)
- One or two additional graduate-level electives, which can include courses in biochemistry, genetics, immunology, cell biology, and pathology, to be chosen in consultation with the Director of Graduate Studies based on the student's background and interest. If there is any question if a certain course will be accepted as one of these electives, please consult Registrar and DGS.

See Graduate School Degree Requirements under [Degree Requirements < Yale University](#)

## Timeline of Experimental Pathology Requirements

	FALL SEMESTER	SPRING SEMESTER
Year One	<ul style="list-style-type: none"> <li>• PATH 620: Research Rotations</li> <li>• PATH 679: Seminar, TMMPP</li> </ul>	<ul style="list-style-type: none"> <li>• PATH622: Research Rotations</li> <li>• PATH 660: Responsible Conduct of Research or equivalent (DGS approval)</li> <li>• PATH 680: Seminar, TMMPP</li> </ul>
	<i>Two elective graduate level, single-term courses to be completed by the end of the second year</i>	
Year Two	<ul style="list-style-type: none"> <li>• Choose a Qualifying Exam Committee</li> <li>• PATH 640: Writing a Scientific Research Proposal</li> <li>• PATH 690: Molecular Mechanisms of Disease</li> </ul>	<ul style="list-style-type: none"> <li>• Sign up for QUAL 999: Preparing for Qualifying Exams</li> <li>• Hold Qualifying Exam</li> <li>• PATH 650: Biology of Cancer</li> </ul>
	<i>The Graduate School requires the grade of Honors in 2 courses by the end of the 2<sup>nd</sup> year.</i>	
Year Three	<ul style="list-style-type: none"> <li>• Sign up for CAND 999: Prep: Admission to Candidacy</li> <li>• Choose a Thesis Committee</li> <li>• First Thesis Committee meeting and presentation of the Prospectus</li> </ul>	
Year Four	<ul style="list-style-type: none"> <li>• PhD students serve as Teaching Fellow 2 courses.</li> <li>• MD/PhD students serve as Teaching Fellow for 1 course</li> <li>• Register for DISR 999: Dissertation Research each semester once prospectus is completed.</li> <li>• Annual Thesis committee meeting</li> <li>• B&amp;BS 503: Responsible Conduct of Research</li> <li>• Present Research in Progress talk annually</li> <li>• Complete Dissertation Progress Report Annually</li> </ul>	
Final Year	<ul style="list-style-type: none"> <li>• Register for DISR 999: Dissertation Research</li> <li>• Finish up data collection, complete analysis and write up dissertation.</li> <li>• Hold Thesis Seminar by December 5<sup>th</sup> for December Degree and May 5<sup>th</sup> for May degree</li> <li>• Annual Thesis committee meeting</li> <li>• Present Research in Progress talk annually</li> <li>• Complete Dissertation Progress Report Annually</li> <li>• Submit Thesis to Graduate School by October 1 (December Degree) or March 15 (May degree). Please see Graduate Calendar.</li> </ul>	

## Qualifying Examination

The qualifying examination of the Pathology and Molecular Medicine graduate program comprises of:

(1) enrollment in the BBS/Pathology course Developing and Writing a Scientific Research Proposal (PATH 640) in the fall term of year two and preparation of a proposal on the topic of the student's research; student will receive assistance from a faculty member who will later be part of the qualifying committee; (2) two literature reading periods in the spring term of year two that are specifically related to the grant proposal; and (3) an oral exam in which the student is examined by the qualifying exam committee on the research proposal, the reading periods, and general knowledge of experimental pathology. This exam is taken in the second term of the second year as described below.

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

### PATH 640: Developing and Writing a Scientific Research Proposal (Fall, Year 2)

- a) This course is designed to prepare students to write a proposal on the topic of the student's research. Students will receive critical feedback from peers and professors and will have a completed research proposal at the end of the course.
- b) 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.

### Formation of the Qualifying Exam Committee (Fall, Year 2):

- a) Students should form their committees confirmed by December (before winter recess).
- b) The qualifying committee consists of 3 faculty members who will be chosen to examine the student. The student will read with 2 of these faculty members individually, which forms the 'reading period' (section c below).
- c) At least one two of the committee members must have an appointment in the Department of Pathology (at least one primary required) 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 DGS faculty member who assisted the student during the proposal writing period will serve as the third person on the committee.
- d) At the oral exam itself, one member of the committee will be selected as the chairperson responsible for documenting the results of the exam for submission to the DGS.
- e) The thesis adviser is not on the qualifying exam committee.
- f) Members of the exam committee should have expertise in areas chosen for reading.
- g) Submit the names of the proposed Qualifying Exam committee to the **DGS for approval**. When committee is confirmed, send email of committee members to Registrar.
- h) **The deadline for holding your Qualifying Exam is no later than June 15<sup>th</sup>**, although it is highly recommended you hold the exam earlier due to committee member availability after mid-May.
- i) Notify Registrar of Qualifying Exam date. You are responsible for contacting ITS for equipment needs and for contacting any specific administrators for reserving a classroom, if necessary.

- j) You must fill out MyIDP Career Development Plan: see section below. You will be asked if you have completed at your committee meeting and will receive a Conditional Pass if you have not done this! This can be found at [myidp.sciencecareers.org/](http://myidp.sciencecareers.org/)

**Reading period with two faculty members (Spring of Year 2):**

- a) Two of the three committee members are advisors for the reading period and should have expertise on specific topics related to the research proposal.
- b) 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.
- c) 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 each advisor.
- d) It is expected that the reading period will last 2-4 weeks depending on availability.

**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.

**Completion of the Oral Qualifying Examination (Spring of Year 2):**

- a) The student must submit their written proposal to the Qualifying Exam Committee members at least one week prior to the exam.
- b) 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, those covered during the reading period, general topics in experimental pathology covered in coursework, and fundamental background knowledge related to the subject areas.
- c) 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.
- d) Following completion of the examination, the student will be asked to leave the room for the committee to discuss the exam.
- e) The Exam Committee chairperson will complete [Pathology and Molecular Medicine Qualifying Exam Form](#) 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.
- f) 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.

The deadline date for holding your committee meeting is no later than **June 15<sup>th</sup>**, however,



it is highly recommended you hold the exam earlier due to committee member availability after mid-May as it is possible that the student receives a Conditional Pass or Fail and may necessitate find it difficult to set up additional committee meeting. Schedule the exam before May in case the committee needs to reconvene).

For general information, check the section on [Qualifying Examination](#) in the Programs & Policies handbook on the Graduate School's Policy and Procedures Section.

### **Prospectus and Admit to Candidacy**

Upon successful completion of the qualifying examination, the student will constitute a dissertation committee including at minimum three members in addition to the dissertation/thesis adviser. At least two of the committee members must be Pathology Department faculty, preferably with primary appointments. The membership of the committee must be approved by the DGS. The student will prepare a written thesis prospectus, consisting of a summary of background information in the field of interest, the specific questions to be answered, a rationale for choosing those questions, and a research plan for addressing those questions. Upon completing the course requirement with at least two terms of Honors, passing the qualifying examination, and submitting a thesis prospectus, students will be admitted to candidacy. This should take place by the end of the third year, and preferably in the second year. Students must then submit a written thesis describing the research and present a thesis research seminar.

### **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 (sometimes referred to as TAC or Thesis 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 the student's progress, provide advice and expertise about the project, and certify when a student has completed sufficient work to begin writing the dissertation.

- a) The Thesis Committee has a minimum of three faculty members in addition to the thesis advisor.
- b) One committee member must hold a primary appointment in Pathology faculty member and serve as the committee Chair. This cannot be the Thesis Advisor.
- c) A second member of the committee must have a primary or secondary faculty appointment in the Department of Pathology. This can be the Thesis Advisor.
- d) In special cases, a student can alter the composition of their thesis committee with the approval of the Thesis advisor and DGS.
- e) Faculty members with expertise in area of dissertation research are particularly helpful and should be sought out as Thesis Committee members.
- f) Additional members may be added if deemed appropriate and can be added throughout the course of the dissertation.
- g) The Thesis committee can be the same as the Qualifying Exam committee; however, this is not required.
- h) 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](#) and contain the specific questions (e.g. Aims) to be answered during the student's research project, the rationale for these questions, and the explanation of why/how various experiments will be performed to answer these questions. For reference, the F31 draft generated as part of qualifying exam and PATH 640a generally follows the format of an NRSA Research Plan, but the prospectus should contain more preliminary data and ideally the final outline of the student's thesis project.

The student should send the final prospectus to the thesis committee at least 1 week prior to the committee meeting.

Students must fill out the Career Development Plan before the meeting (MyIDP with a list of objectives). This plan must be updated at least every 6 months from this point forward and is encouraged to be discussed periodically with the thesis advisor. While MyIDP may give you an idea of a career trajectory, it is insufficient in providing a list of actionable next steps and objectives. (IDP section below)

At the beginning of the meeting, faculty will excuse the student to discuss the proposal. The student will then return and proceed with a presentation of the prospectus, with visual aids. The student may meet with the committee before the start of the presentation in the absence of the thesis advisor as well.

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 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.

- a) The thesis advisor will be excused, and the student will privately discuss any additional questions with the committee.
- b) 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.
- c) **The deadline for holding your Prospectus is no later than June 15<sup>th</sup>**

## 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. Students should prepare a brief report and forward to the committee **at least one week** before the meeting.

Students are required to bring the Pathology and Molecular Medicine Thesis Committee Form. [Pathology and Molecular Medicine Thesis Committee Form](#)

Once a meeting is scheduled, the student must advise the Registrar of the date.

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.
- If a manuscript is in preparation, students are 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
  - 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.

Career development should be discussed at every Thesis Committee meeting (see below)

## Teaching Requirements

In accordance with the BBS program, Ph.D. students are expected to participate in two terms (or the equivalent) as a Teaching Fellow. Teaching assignments in fulfillment of the requirement must be approved in advance by the DGS. Pathology Students do not teach in Year 1 & 2 unless special circumstance and approved by the Director of Graduate Studies and the student's PI.

All graduate students are required to serve as teaching fellows 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 lectures, laboratory, and seminar courses offered at the undergraduate, graduate, or medical school levels. Please see the graduate school's website for details on the different positions and types. [Teaching Fellow Program | Yale Graduate School of Arts and Sciences](#)

- a) Students generally fulfill this requirement in the 3rd year after they qualify.
- b) If students have a specific course they are interested in, they should contact the course professor well ahead of the course beginning and TF assignments (see section c below).
- c) 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.
- d) MD/PhD students are only required to TF one course (at the TF-10 level).
- e) Prior to the first semester of teaching, each student must attend *Teaching @ Yale Day (@TYD)*. This session is only held prior to the start 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.
- f) 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. Stipends for additional teaching are determined by the university.
- g) Priority for assignments is given to students needing to fulfill their teaching fellow requirement. Students are not allowed to be a teaching fellow for 2 full term courses in one semester.
- h) If you would like to teach and your requirements are met, you will need permission from both your PI and the DGS. You should not commit to a department until these approvals are given.

### **Bi-Annual Individual Development Plan (IDP)**

The Individual Development Plan (IDP) AAAS/*Science* joined forces with FASEB and experts from several universities to create a unique, web-based career-planning tool tailored to meet the needs of PhD students in the sciences. myIDP provides:

- Exercises to help you examine your skills, interests, and values.
  - A list of 20 scientific career paths with a prediction of which ones best fit your skills and interests.
  - A tool for setting strategic goals for the coming year, with optional reminders to keep you on track.
  - Articles and resources to guide you through the process.
  - Students are to define their career goals and develop a plan on how to achieve them. As part of this, students will define how they can work with their mentor, thesis advisor, DGS, and graduate program to align expectations to meet these goals.
- a) Students are required to fill out the IDP at://myidp.sciencecareers.org/to design their professional and career development trajectory every 6 months. This includes updating a list of career objectives and checkpoints.
  - b) Students may choose to use their thesis advisor as a career mentor, but this is not

necessary. Additional resources and ways to network with potential mentors are included in section f.

- c) Students are required to update their plan to meet career objectives with a set of actions they will take to meet these checkpoints.
- d) Students are encouraged to discuss their plan with their mentor periodically. While career objectives may not change weekly, meetings should occur within a month of large changes or steps, and at least every 6 months regardless of the student's career stage. If the student's thesis advisor is not the career mentor, then the student should meet with the thesis advisor at least every 6 months to discuss current developments and a timeline.
- e) During the 4<sup>th</sup> year of study, the mentor should be discussing with the student specific careers and job opportunities regardless of whether or not the student is projected to graduate within the next year. This is to help align the student's career development progress in a hypothetical construct with the current demands and requirements for entry into the desired field of employment. This may include looking at current job listings while meeting with the student to discuss current strengths and deficits, then discussing how the student can overcome these deficits before graduation to become an excellent job candidate.
- f) Additional career development resources are available through the Yale Office of Career Strategy: <https://ocs.yale.edu/>

### **Master of Science (M.S.)**

Students are not admitted for this degree. On a case-by-case basis and subject to faculty vote, students who are not continuing for the Ph.D. may be considered for an M.S. degree if they have successfully completed the course requirements for the Ph.D. degree listed Graduate School of Arts and Sciences requirements. Students who meet this criterion are eligible to petition for the M.S degree. The M.S. degree is not awarded as an *en route* degree.

### **Master of Philosophy (M. Phil)**

Awarded only to students who are continuing for the Ph.D. Students are not admitted for this degree. Students will be automatically petitioned by the university for a M.Phil. after successful completion of the requirements at the end of the third year. No additional action on the part of the student.

### **Dissertation Progress Report (DPR)**

Following admission to candidacy, students are required to complete a [Dissertation Progress Report](#) annually.

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 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.

### 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

#### Notification Deadlines:

**September 1:** Notify the DGS (cc registrar) of your intent to submit dissertation for December Degree

**February 15:** Notify the DGS (cc registrar) of your intent to submit dissertation for September Degree

#### Dissertation Submission Deadlines:

**October 1 by 5:00 pm** for December degree conferral

**March 15 by 5:00 pm** for May degree conferral

*There are no extensions to the above dates.*

Dissertations submitted after the above deadline will be processed in the following degree date.

- After the thesis committee has approved the writing of the thesis, the student selects a date for the Thesis seminar in consultation with the Committee. This seminar has a public and private component.
- Notify the Registrar of the Date of your seminar, Title, Location (or zoom link) **as soon as** a date is determined in order to give adequate advertising as well as recording purposes.
- The seminar must include entire Thesis Committee present. Plan on scheduling a location for the seminar with enough time for the private defense afterwards.
- The public defense typically lasts 1 to 2 hours and starts with an introduction of the student by the Thesis Advisor, then a 45–55-minute seminar by the student, and then followed by questions from the audience members.
- This public defense is immediately followed by a private meeting of the student by the Thesis Committee in the same location. The length of the meeting is variable and an opportunity for the committee members to ask any questions.
- Private meetings may last as little as 15 minutes or go longer than an hour.

The dissertation should demonstrate the student's mastery of relevant resources and



methods and should make an original contribution to knowledge in the field. Normally, it is expected that a dissertation will have a single topic, however broadly defined, and that all parts of the dissertation will be interrelated but can constitute essentially discrete units. Beyond this principle, the faculty will apply the prevailing intellectual standards and scholarly practices within their fields in advising students regarding the suitable scope, length, and structure of the dissertation, including what constitutes an original contribution to that field.

In accord with the traditional scholarly ideal that the candidate for a doctorate must contribute to knowledge, all dissertations that have been accepted by the Graduate School are published electronically through ProQuest and are deposited in the collection of the Sterling Memorial Library. As such, classified or restricted research is not acceptable as part of the dissertation.

Exceptions must be approved in advance by the Degree Committee.

1. 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.
2. 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. Treat a dissertation the same as a journal submission in regard to copyright and plagiarism rules. Please ask your thesis advisory and collaborators for permission if your dissertation contains sensitive information.
3. 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.
4. 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. Treat a dissertation the same as a journal submission regarding copyright and plagiarism rules. Please ask your thesis advisory and collaborators for permission if your dissertation contains sensitive information.
5. Please note, Pathology and Molecular Medicine *strongly* recommends each student have at least a primary research manuscript in submission to a journal before the committee gives permission to write.

### Thesis Committee Members

- Three readers required with a maximum of five allowed. Two must be ladder or ladder-track Yale faculty. All readers must hold a Ph.D. degree and a faculty position or be considered otherwise qualified to evaluate the dissertation.
- At least one of these readers must have a primary appointment in the Department of Pathology not the Student's Thesis advisor.

- One reader may be from outside of the Yale Community, although not required.
- If all qualifications are met, a student may choose to have their Thesis Committee Members serve as their readers.
- All committees must be approved by the Director of Graduate Studies
- All appointments of readers are subject to review by the Associate Dean.
- One of the readers may be from outside the Yale Community, however, no outside reader is required.

## Submitting Degree Petition and Dissertation in DPRS

The [Degree Petition](#) page in DPRS consists of the degree petition, links to required surveys, and site to upload a pdf of your dissertation. **No paper submission is required.**

- The adviser and committee have approved a dissertation for submission and the Director of Graduate Studies has been notified, the student submits the dissertation along with the degree petition and other forms based on the requirements set forth on the Dissertation Progress Reporting and Submission (DPRS) site <https://dissertation.yale.edu/dprs/>
- A PDF copy of your dissertation may be submitted using the degree petition page in the Dissertation Progress Report site. site at any time within the academic year. Dissertations submitted after the above semester deadlines will be processed for the following degree date.
- Upon submission of your dissertation and approval of readers by the DGS, a pdf copy of your dissertation will be automatically sent to all readers.
- Upon request from reader, students are required to provide a soft-bound copy of the dissertation to reader.
- The dissertation title is populated from the most recent Dissertation Progress Report. You can change the final title on the petition page by clicking the “No” radio button and modifying the title. Click the save button at the bottom of the page to save title prior to submitting the dissertation.
- Survey of Earned Doctorates – submission confirmation page.
- GSAS Exit Survey – upload first page of GSAS Survey that has your email address.
- ProQuest (ETD) Publication Agreement – detail page: All dissertations that have been accepted by the Graduate School are published electronically through ProQuest and are deposited in the collection of the Sterling Memorial Library. As such, classified or restricted research is not acceptable as part of the dissertation.
- Copyright available through ProQuest is optional and an additional fee.  
The dissertation title is populated from the most recent Dissertation Progress Report. You can change the final title on the petition page by clicking the “No” radio button and modifying the title. Click the save button at the bottom of the page to save title prior to submitting the dissertation.



## Notification of Readers (NOR)

Student creates the Notification of Readers (NOR) in the [Dissertation Progress Reporting and Submission](#) (DPRS) site prior to submission of the dissertation.

- If you are listing Yale Faculty, much of the information will be prepopulated in the NOR system.
- Students will have access to their Reader Reports once all the Reports have been submitted. The student should keep a copy of Readers reports for their records as will only be available for the term of the Degree. Once the degrees are awarded, students will no longer have access to the reports.
- All reader comments should be carefully reviewed!

Should a reader indicate that a dissertation contains significant errors in typing, grammar, spelling, reference citations, or other textual matters, the student will be required to revise the dissertation by a date provided by the Committee. A new pdf of the dissertation must be uploaded in the DPRS system. The Graduate School must receive a letter from the Director of Graduate Studies indicating that the student has addressed the readers' concerns, before the dissertation can be recommended for a degree.

Students will have access to their readers reports once all the reports have been submitted. They should keep a copy of the readers reports for their records because they will only be available to them for the term of the degree. Once the degrees are awarded, students will no longer have access to their readers reports.

Final changes must be uploaded in DPRS within 30 days **after** the submission deadline. To make changes to your dissertation after it has been submitted, email

[dissertationreaders@yale.edu](mailto:dissertationreaders@yale.edu)

An email should be sent to [dissertationreaders@yale.edu](mailto:dissertationreaders@yale.edu) attention: Barbara Withington from the DGS or Advisor stating that the changes are minor or editorial and not substantive to the dissertation. Once Barbara receives the email, she will unlock the dissertation so the new edited dissertation can be uploaded.

In the event a dissertation is evaluated as failing, departmental practice determines the number of reevaluations normally permitted.

The Graduate School does not require departments to evaluate the dissertations of degree candidates who are no longer registered. The decision to review such dissertations rests with the department. **Please note the most up to date information is on the Graduate School website.**

### Contacts:

- Dissertation Office: [dissertationreaders@yale.edu](mailto:dissertationreaders@yale.edu)
- Barbara Withington: [barbara.withington@yale.edu](mailto:barbara.withington@yale.edu)
- Claudia Schiavone: [claudia.schiavone@yale.edu](mailto:claudia.schiavone@yale.edu)
- Marris DeLise: [marrisa.delise@yale.edu](mailto:marrisa.delise@yale.edu)

**Dissertation information site and should be the primary resource for dissertation information.**

Please see: [Dissertation Submission | University Registrar's Office \(yale.edu\)](#)

### **Formatting:**

Consult the Formatting Guide. Double-check to ensure that your title and abstract pages are done correctly and that your dissertation is printed out single-sided

For formatting questions, please email [barbara.withington@yale.edu](mailto:barbara.withington@yale.edu).

1. 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.
2. 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. The student, in consultation with the Thesis Advisor, must identify three readers who will evaluate the dissertation. These readers may be sourced from the Thesis Advisory Committee if all the qualifications are met.
4. Three readers required with a maximum of five allowed. Two must be ladder or ladder-track Yale faculty. All readers must hold a Ph.D. degree and a faculty position or to be considered position or be considered otherwise qualified to evaluate the dissertation. (Graduate School Requirement).
5. One of these readers must have a Primary Appointment in Experimental Pathology and cannot be the student's Thesis Advisor.
6. One of the readers may be from outside of the Yale Community, however, no outside reader is required.

The Pathology and Molecular Medicine 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 their dissertation.

### **Thesis Seminar**

- 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.
- Students are required to e-mail the title of the thesis and date/location of the seminar to the Graduate Registrar. We will need this information for both our records and to advertise the Department. This seminar has both an open (public) and a closed door (committee only) session.
- The entire Thesis Committee must be present at the seminar. Plan on scheduling a location for the seminar with enough time for the closed-door session following the

seminar.

- The public seminar typically lasts 1 hour and starts with an introduction of the student by the Thesis Advisor, then a 45-55 min seminar by the student, and then followed by questions from the audience members.
- The public seminar is immediately followed by a private meeting of the student and the Thesis Committee in the same location. The length of the meeting is variable and an opportunity for the committee members to ask any questions.

**\*\*Students must hold their seminar no later than December 5<sup>th</sup> for December Degree and May 5<sup>th</sup> for May Degree.**

### **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

### **Registration**

Students are normally given the first 10 days of classes to register. You will receive notification of the Online Course Selection deadline each semester. All students must complete the Online Course Selection. Online Course Selection and Instructions for same are found here: <http://www.yale.edu/sfas/registrar/>

### **International Student Registration**

International students must register at the Office of International Students and Scholars (421 Temple St.) before registering with the Graduate School. International students are strongly encouraged to use this office as a resource for any problems related to their foreign-student status.

### **Leave of Absence**

A student in good standing who wishes to interrupt their study temporarily for personal reasons (i.e. maternity leave, financial necessity, health problems or other extenuating personal circumstances) may, with approval of the Directors and the Dean, be granted a leave of absence of up to one year for students who have successfully completed one year of study and two years for students who have been admitted to candidacy for the Ph.D. degree. Students on leave may not engage in full-time degree-related activities during the period of leave. However, students may participate in full-time teaching or other full-time employment or pursue training for a special skill while on leave of absence. Students on leave of absence need not apply for readmission before returning to Yale. However, to be considered for financial aid in the year following a

leave of absence, students must submit a formal application to the Program by February 1 of the year preceding return. Students on leave will not be enrolled in the Yale Health Plan but may continue membership by paying full fees.

### **In Absentia Registration**

Students whose circumstances require full-time study at another institution, or dissertation research on a full-time basis outside the New Haven area can register in absentia provided he/she receives prior written approval of the Program Directors and the Dean of the Graduate School. Students who register in absentia do not qualify for Yale Health Plan services unless they are paying full tuition but may enroll themselves and their dependents at full cost.

**Parental Leave** <https://gsas.yale.edu/parental-relief-phd-students> Registered Ph.D. students who wish to modify their academic responsibilities because of the birth or adoption of a child may request parental support and relief during or following the term in which the birth or adoption occurs. For the whole of the term in which the support and relief are granted, the student's academic clock stops, effectively adding an additional term to the total time to degree. During this period, students remain registered full-time, receive a standard financial aid stipend and Health Award, and receive modified departmental academic expectations that best suit the specific situation. The precise nature of the academic responsibilities undertaken or suspended during this period should be a matter of consultation between the adviser and the student, with the understanding that students are entitled to full relief from responsibilities for at least an eight-week period. Most students take an entire term of parental relief, but the relief may be split in two, with a student taking only eight weeks of relief during the term in which, or just after, a birth or adoption occurs and then receiving an additional eight weeks of stipend funded by the Graduate School postponed to a later term. Parental relief may not be combined with other funding. To arrange for parental relief, a student should contact the appropriate associate dean four months prior to a birth or adoption. This benefit is limited to two birth or adoption events.

### **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 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.

## **Pathology and Molecular Medicine Graduate Courses**

\*Denotes required coursework

### **\*PATH 620 and 622: Laboratory Rotations in Experimental Pathology**

*Themis Kyriakides*

Laboratory rotations for first-year graduate students.

### **PATH 625: 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 630: 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 640: Developing and Writing a Scientific Research Proposal**

*Katerina Politi, Jean Ju Chung, Rui Chang*

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 650: 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 660/C&MP 650/PHAR 580: 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 670: Pathobiology**

*Jon Morrow, Karin Finberg, Samuel Katz, Declan McGuone, Harold Sanchez*

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 679 and 680: Seminar in Molecular Medicine, Pharmacology and Physiology**

*Don Nguyen, Susumu Tomita and Titus Boggon*

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 681: Advanced Topics in Cancer Research**

*Kurt Schalper and Ryan Jensen*

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 682: Cancer Clinical Translation**

*Samuel Katz and Ranjit Bindra*

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.

This course is only offered every other year (odd-numbered years).

**\*PATH 690, Molecular Mechanisms of Disease**

*Demetrios Braddock and 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.

Updated 7/25/24