Pathobiology Graduate Program

2023-2024

Student Handbook

BROWN
Pathobiology Graduate Program

Introduction

Graduate training in Pathobiology is offered within the Division of Biology and Medicine at Brown University. Pathobiology is defined as an interdisciplinary field of research focused on characterizing the mechanisms of disease. The techniques of molecular biology and biochemistry are applied to characterize structural, functional, and chemical abnormalities occurring at the inter-, intra-, and sub-cellular levels. Knowledge acquired at these basic levels is then systematically integrated to provide a fundamental understanding of the disease process.

The Pathobiology program is dedicated to individualized graduate education. Courses are designed to prepare students for interpreting basic research by emphasizing a curriculum based on the analysis of primary literature. In conjunction with a core of required courses, students together with their mentors design an individualized program of study that provides the foundation required to successfully complete an independent thesis project. Pathobiology faculty lead a wide range of research programs relevant to human disease with training available in the areas of Toxicology and Environmental Pathology, Cancer Biology, Aging, and Infection & Immunity. State of the art facilities that include, but are not limited to instrumentation for cell sorting and analysis, advanced microscopy and other imaging systems, spatial transcriptomics, bioinformatics analysis, transgenic mouse generation, proteomics and genomics are available to students in the program**.** Through the collaborations with the faculty and clinicians at the Warren Alpert Medical School and affiliated hospitals students also have the opportunity to work on translational projects involving patient samples and primary cells.

The major requirement for the PhD is the doctoral thesis which summarizes student's original research. This research should make a significant contribution to the student's respective field of study as evidenced by publication in a peer-reviewed journal. The expectation is that to receive a PhD, a student will have at least one first author/co-first author publication or two middle author research publications at least at the stage of submission to a peer-reviewed journal at the time of graduation. Attainment of the doctoral degree on average takes about five and a half years. The minimum requirement to receive a degree is the equivalent of three years of full study (24 tuition units or tuition months). General requirements of the graduate school are listed in the Graduate Student Handbook.

Admissions

Students entering the Pathobiology Graduate Program will usually have at least two years of college chemistry (including organic chemistry and physical chemistry) and one year each of calculus and physics, in addition to college courses in biology. These should include courses in cell biology, genetics, molecular biology, developmental biology, and/or biochemistry.

Students who are admitted without having sufficient background in all these topics will be encouraged to take the appropriate introductory level courses at Brown before enrolling in advanced courses in the respective area.

All international applicants whose native language is not English must submit an official Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) exam score.

Appointment and Support information

PhD students admitted to the Pathobiology program receive a stipend as well as full tuition, health fee and health insurance. Each graduate student receives an "Appointment" at Brown that stipulates the terms of the stipend and support. Graduate students are paid once monthly, on the last day of the month. There are four possible appointment types: Fellow, Teaching Assistant, Trainee or Research Assistant.

- **FELLOW:** A student is appointed as a FELLOW when they are being supported by their own external fellowship OR when they are being supported by the Division of Biology & Medicine prior to being assigned to a lab or research group. Typically, students are DIVISIONAL FELLOWS in their first year (although many first year students receive other types of appointments). Students who are awarded their own Fellowships are also appointed as Fellows. Each granting agency has specific rules and we will work with the student and the Grants Administration Office to be sure that student's appointment reflects the terms of the grant. Even students who receive grants that pay them directly should receive an appointment at the Graduate School. Payroll taxes and income taxes are not withheld from students appointed as Fellows. If your fellowship award is less than the published Brown Pathobiology stipend, your award will be supplemented so that your stipend level is the same as other Pathobiology PhD students, as long as the terms of your award do not prohibit supplementation.

- **TEACHING ASSISTANT (TA)**: A student is appointed as a TA when they are assigned to be a Teaching Assistant. In general, most students are appointed as a TA in their second year for either Spring or Fall semesters. In many cases, payroll/income taxes WILL be withheld while a student is a TA. The Associate Dean will work with Graduate Program Directors to determine the best matches for TA assignments. Every effort will be made to pair student's skills and training objectives with the needs of the Division, but it should be noted that students are not allowed to select their own assignments and their TA assignment preference is not guaranteed.

- **TRAINEE:** A student who is funded through a Program training grant, will be appointed as a TRAINEE. Training grants are awarded to Brown and administered by a faculty member. The grant is devoted to the training of students. Each training grant is different and has different objectives – terms of the grant will dictate the selection of students who are appointed. Students who are appointed as TRAINEES will not have income or payroll taxes withheld.

- **RESEARCH ASSISTANT (RA):** Students who are working in a lab or on a project with a faculty member and are being funded by their mentor's grant or program are appointed as RAs. Most students in their third year and above are appointed as RAs. Typically, income and payroll taxes are withheld from RA paychecks.

Appointment types are linked to funding sources. Be aware that the source of your funding can change from year to year and even from semester to semester. This will affect your taxes and net pay.

In consultation with your advisor, Program Directors and the Associate Dean, your appointment will be decided prior to the start of each semester. It is important to keep in mind that any money you receive from Brown may be considered taxable income. The impact of the appointment type dictates only whether taxes will be withheld from your check – NOT whether you owe taxes. You may also contact the Program Directors or Coordinator if you have any questions about your appointment.

Other Aspects of Your Student Support

TUITION: For students entering PhD study with a bachelor's degree, your support includes the remission of tuition. A minimum of 24 tuition units is required for graduation.

HEALTH INSURANCE: Each new student receives insurance coverage through the Brown Student Insurance Program. You will receive your insurance card via campus mail.

HEALTH FEE: All students in residence will have their health fee paid and thus, have access to the Brown University Health Services during the academic year.

STUDENT OBLIGATION: All graduate students are required to pay an annual $80 Student Activity Fee, and $80 Recreational Fee.

Academic Advising and Mentoring

Two or three faculty members along with the Program Director and Coordinator will primarily serve as the student's advisory committee. This committee will advise the student twice a year on academic matters and will review the student's progress each semester until the thesis committee is selected.

Expectations for Satisfactory Student Progress

All courses must be taken for a grade unless an approved course is mandatory S/NC. Pathobiology students must earn a minimum of grade B, or the equivalent performance in a course taken S/NC, in all courses utilized to fulfill the requirements for the doctoral degree. Grades of B in research or academic work may result in 'Satisfactory Standing', but the student will be made aware of this and have the opportunity to return to 'Good Standing' the following semester.

If this level of performance is not attained in any one course, the student will be placed on academic warning, and the Directors of the Graduate Program, in consultation with the course instructor(s) and the student's advisory committee, will determine the course of action needed to attain proficiency in this area. If B-level performance is not attained in two courses, the Directors of the Graduate Program, in consultation with the student's advisory committee and the Pathobiology Graduate Program Steering Committee, will determine if the student may continue in the program. If B-level performance is not attained in three courses, the student will be removed from the Pathobiology Graduate Program without further evaluation.

The Directors of the Graduate Program in consultation with academic advisors continually assess not only student academic achievement, but evidence of motivation, aptitude for bench work, and dedication to research, striving for excellence, intellectual engagement, responsibility, maturity, and participation in program activities. Failure to achieve satisfactory progress in areas other than coursework may also be grounds for Warning Status.

Course of Study

Graduate training includes a combination of didactic coursework, teaching and independent research. There is a requirement of 24 tuition credits for the PhD degree, of which a maximum of eight can be transferred from a Master's degree earned at another institution. Of these eight credits no more than four credits can replace didactic coursework. During the first two years, students will register for 4 tuition credits through a combination of coursework and graduate research. After the first two years, students will fulfill this requirement primarily through their independent dissertation research, but students may also continue to register for courses that are related to their training throughout their time at Brown.

For Pathobiology students, the general course of study highlights the following:

- Establishing competence in disciplines essential for the study of disease mechanisms
- Acquiring a foundation in cellular and molecular biology
- Gaining an understanding of the experimental and conceptual structures in the field of biology
- Encouraging diversification of training, while maintaining the flexibility within the framework of formal study

Students in the Pathobiology Graduate Program are required to take the core course, 'Molecular Mechanisms of Disease'. Complementary Focus Area courses (see example list below) will be selected in consultation with the advisory committee. Graduate students are subject to all of the Registrar's deadlines regarding course registrations.

Core Course

- BIOL 2860 Molecular Mechanisms of Disease (Fall)

Focus Area Courses (list not exhaustive)

- BIOL 0470 Genetics (Fall)
- BIOL 0800 Principles of Physiology (Spring)
- BIOL 1100 Cell Physiology & Biophysics (Spring)
- BIOL 1120 Biomaterials (Spring)
- BIOL 1290 Cancer Biology (Fall)
- BIOL 1520 Innate Immunity (Fall)
- BIOL 1550 Parasitism: Biology and Disease (Spring)

- BIOL 1555 Methods in Informatics and Data Science for Health (Spring)
- BIOL 1565 Survey of Biomedical Informatics (Fall)
- BIOL 1970A Stem Cell Biology (Fall)
- BIOL 2089 Importance of Intellectual Property in Biotechnology (Fall)
- BIOL 2040 Ultrastructure/Bioimaging (Spring)
- BIOL 2310 Developmental Biology (Fall)
- BIOL 2350 The Biology of Aging (Spring)
- BIOL 2540 Molecular Genetics (Spring)
- BIOL 2545 Human Genetics and Genomics (Spring)
- BIOL 2560 Advanced Virology (Fall)
- BIOL 1295 Fundamentals of Cancer Immunotherapy (Spring)
- BIOL 2865 Toxicology (Spring)
- CLPS 0950 Introduction to Programming (Spring)
- CLPS 1480B Cognitive Aging and Dementia (Spring)
- NEUR 1020 Principles of Neurobiology (Spring)
- NEUR 1540 Neurobiology of Learning and Memory (Spring)
- NEUR 1740 Mechanisms of Neurological and Psychiatric Disorders (Spring)
- PHP 1501 Essentials of Data Analysis (Fall)
- PHP 2120 Introduction to Methods in Epidemiologic Research (Fall)
- PHP 2510 Principles of Biostatistics (Fall)
- PHP 2560 Statistical Programming with R (Fall)

Focus Area Courses may be substituted with prior approval of the Program Directors.

After satisfying the academic credit requirement, all students must enroll each semester in either a full-time graduate independent study or thesis preparation to remain an "enrolled student".

- BIOL 2980 Graduate Independent Study (Spring or Fall)
- BIOL 2990 Graduate Thesis Preparation (please note this is not for credit)

Responsible Conduct in Research Training (RCR)

All entering PhD students in the Division of Biology and Medicine are required to take RCR training. RCR training is organized by the Office of Graduate and Postdoctoral Studies during the Fall semester of a student's first year. In addition, the Division requires that graduate students complete refresher training in RCR during their fourth year of study.

Individual Development Plan (IDP)

In response to NIH requirement regarding the use of individual development plans, matriculated graduate students will complete and submit an IDP to both the Program Directors and the Office of Graduate and Postdoctoral Studies. Incoming students will be provided with a template for the IDP during RCR and this will be built upon during the period of graduate training. It is expected that the IDP be updated at least annually in collaboration with thesis advisor/mentor. The IDP is a valuable tool that gives trainees the opportunity to define their short-term and long-term goals. Research shows that people who incorporate career planning into their training are more likely to reach their goals. The IDP is intended for scientists at all career stages to think about and develop goals for the next 6-12 months with the intent to advance career development. These goals should include, but are not limited to, research project goals, career advancement goals and skill development goals.

Introduction to Research in Pathobiology ('Faculty on Parade')

Introduction to Research in Pathobiology is offered as a series of presentations by the active Pathobiology trainers to introduce incoming Pathobiology graduate students to research opportunities available in the laboratories of program faculty. Attendance of these presentations is mandatory and is part of the activities required for successful completion of BIOL 2980 in the first semester at Brown.

Research

Students are expected to work in three laboratories for a period of 8-10 weeks each during the Fall and Spring semester as well as winter intersession to complete their required 3 research rotations. The rotations are intended to provide familiarity with several research areas so the student can make an informed choice of a laboratory for their thesis research. The choice of the thesis advisor is expected to be made no later than the end of the Spring semester of a student's first year in the program. Students may request permission from the DGSs to perform additional rotations on a case-by-case basis. If students are unable to find a thesis lab after 5 rotations before the Fall semester of their second year, they will automatically be put on warning status and depending on the specific circumstances related to their performance their continuation in the program may be in jeopardy. Students are expected to dedicate their full effort outside of their coursework and other program activities to their research projects. Students may be placed on Academic Warning for failure to maintain satisfactory research progress.

For Academic Year 2023-24:

Rotation 1: September 18 – November 22
Rotation 2: November 27 – February 16
Rotation 3: February 19 – April 19

The expectations of a faculty mentor are that they make every effort to provide the student with the skills and knowledge base to succeed in their chosen field of research. Mentors will ensure that students follow ethical procedures in their research. Mentors will be available to regularly discuss project progress.

Mentors will also regularly provide feedback to students so they can evaluate their overall progress and help to guide career goals.

Research Seminars

Approximately 25 seminars are offered each academic year. Guest lecturers are invited by program faculty and students, and represent the four thematic areas of the Pathobiology Graduate Program. The Pathobiology program hosts a Spring Seminar Series during the second semester that all students in the program are required to attend weekly. During the Fall semester, first year students are required to attend the MMI departmental seminar, and students in thesis labs are required to attend a weekly seminar of their choice such as those offered by the Department of Molecular Microbiology and Immunology (MMI), Department of Pathology and Laboratory Medicine (PLM), Cancer Center at Brown University Biology of Aging program. All these constituents host seminar series that relate to the four thematic areas and are likely of interest to our students. The Division of Biology & Medicine publishes a weekly digest of events that contains seminar announcements.

Journal Club

This weekly research seminar takes place throughout the academic year. The expectation is that students present data from their current work and/or critical analyses of recent literature. Each graduate student will present one journal club each year. Attendance and active participation are required. Once students have reached the final writing stage of their thesis, they may request to be excused from this requirement by the DGSs.

Retreat

The Pathobiology Graduate Program holds an annual retreat that takes place the week before the Fall semester starts. This is an important part of the graduate educational experience, as students have an opportunity to present their work in either poster or talk form, and also hear about their colleague's research. In addition, there are 1-2 outside keynote speakers that assist in evaluating the graduate program. This is a required activity and missing the annual retreat must be excused by the DGSs.

Teaching

Teaching Assistantship. All students are required to serve as a teaching assistant for one semester. This teaching requirement will be fulfilled by assisting in courses in which graduate students lead a discussion component or laboratory section and/or present a small number of lectures. The faculty member in charge of the course is responsible for providing feedback and suggestions to the teaching assistants on their performance at least twice during each semester. The program will also request feedback from the course faculty member or the teaching assistant. Teaching assignments are determined by the Associate Dean for Graduate and Postdoctoral Studies, in consultation with the Program Directors.

Harriet W. Sheridan Center for Teaching and Learning. Because the development of teaching skills is an important part of the PhD training in Pathobiology, all students are required to obtain a Level I teaching certificate from the Sheridan Center. The Level I teaching certificate is a year-long training which consists of four online components and four interactive workshops. Students should register for the Level I teaching certificate in early September of their second year in the program.

The Sheridan Center offers five levels of teaching certificates, and students are encouraged to obtain additional certificates if they so choose. The Center runs several programs and workshops including individual teaching consultations. The Sheridan Center's Teaching Certificate Program serves as the centerpiece of a teaching portfolio and demonstrates commitment to teaching excellence.

Travel Funding

Graduate students who present original work at academic conferences may be eligible to receive travel funding. For those eligible, the Program will assist with travel-related expenses of one professional trip per fiscal year up to $500. These awards are dependent on being in good academic standing as well as being an active participant in the Pathobiology Graduate Program activities. This includes attendance in journal clubs, seminars, and the annual retreat, as well as making good progress in research, teaching, and coursework. Travel award funding is available only to those students who will be presenting at the conference. This award may be combined with other sources and will be issued in the form of reimbursement with appropriate receipts. If seeking reimbursement, students must communicate their travel plans in advance with the program. This allows for coordination of flights with FCm Travel Solutions, which is the preferred travel agency of Brown University. They will ensure that flights are compliant with the Fly America Act and students will not incur out-of-pocket expenses to book flights. Brown University travelers who use FCm to book their travel receive the added benefit that their trip is automatically registered with the University's travel assistance company, International SOS. Graduate students are encouraged to apply for additional funding from other University resources, including OGPS, the Graduate Student Council, and the International Travel Fund. All offices, including Pathobiology, require at least one-month notice prior to travel.

The following 'Best Practices' are per the University Controller, and Program guidelines. Travelers must:

- Process expenses within 60 days of their return, or reimbursement is subject to taxation.
- Cite all training support on posters and abstracts. This includes Federal grants and internal funding.
- Book Standard room accommodations at non-luxury hotels. Airbnb lodging is disallowed.
- Reimbursement covers hotel stays for check-in one day before a conference, and check-out one day post-conference. Any additional overnights are not included.
- Purchase non-refundable, coach class airline tickets, if not booked with FCm Travel Solutions.
- Pay only for their own travel costs. Lab staff and colleague expenses cannot be reimbursed.
- Provide credit card/bank statement to verify cardholder and charges.
- For international travel, verify USD conversion via credit card/bank statement.
- Consult with their mentor regarding meal reimbursement and/or per diem.
- Review University/grant lodging maximum per diem rates prior to booking.

- Utilize rental cars only when less expensive than airline or rail travel, or it is necessary to transport equipment or materials. Prior approval is required.

Resources for Support

There are several sources available for academic support including those listed by the Office of Graduate & Postdoctoral Studies.

In addition, we ask that students inform the Directors of the Graduate Program if they have a disability or other condition that might require accommodation or modification of any course procedures. As part of this process students should also register with Student Accessibility Services (SAS) and provide the Directors with an academic accommodation letter from them. For more information students can contact SAS at SAS@brown.edu or (401) 863-9588.

Students seeking more information regarding Medical Leave should contact Student Support Services (Graduate Center, 4th floor).

Counseling and Psychological Services (CAPS) provides free confidential counseling (Page-Robinson Hall, Room 512, 401-863-3476). CAPS offers Saturday appointments for graduate students from 9 am to 4 pm during the academic year at Health Services, 13 Brown Street.

Maria Suarez, Associate Dean of Student Support in the Graduate School, is dedicated to serving Master's and PhD students (Horace Mann 110, maria_suarez@brown.edu, 401-863-1802).

Students can also contact the Brown Ombuds Office, which can provide independent, confidential, neutral and informed advice. This Office can help with any issues arising from or affecting the work of students at Brown.

In addition, Brown's Graduate School offers a wealth of information on Graduate Student Resources.

The Office of Graduate & Postdoctoral Studies provides several resources for professional development including instructions on writing Individual Development Plans and a list of current funding opportunities. There is also the option of taking a variety of training modules from the Initiative to Maximize Student Development. These modules are targeted to graduate students and examples include "Designing and Delivering Scientific Presentations" and "Professionalism and Career Development: Preparing for the Postdoc Experience".

The Pathobiology Program also offers the opportunity for students to serve on various committees. Service on these committees fosters the development of leadership skills. Announcements for service are made annually through the Pathobiology distribution email. Opportunities for service include serving as a peer mentor to a first-year student, seminar committee, admissions committee, Diversity, Equity, and Inclusion Committee (DEIC), taking part in Preview Day and various other recruiting activities.

Studying Abroad

Students who are planning to study abroad are strongly encouraged to register the trip with the Brown University Global Assistance Program. This program provides 24-hour worldwide medical, security, and travel assistance, including emergency evacuation. Please visit the website for more information and the access code to Brown's International SOS portal.

Formation of Thesis Committee

During the Spring semester of a student's second year, the student, in consultation with their thesis advisor, will assemble a thesis advisory committee. The committee will consist of the student's advisor and three additional program faculty members. One member of the student's committee may be from outside the program with prior approval from the Program Directors. The student is to inform the program in writing once the selection of the thesis committee is complete.

The initial committee meeting is brief, no more than one hour, and is essentially an organizational meeting. The student is expected to present slides outlining the thesis project. A 20-30 minute presentation is to be planned for this initial meeting. The main goal of this meeting is to schedule and discuss expectations of the preliminary qualifying exam.

The thesis committee will serve as the examination committee for the preliminary examination. The preliminary examination must be completed by August 1 of the student's second year in the program. After completion of the preliminary examination, the student will meet with the thesis advisory committee **at least once each year** to review their progress.

A brief written report of progress and proposed work is prepared by the student before each of these meetings. The thesis advisory committee continues to guide the student's research throughout their thesis work and, with the addition of an external examiner, will serve as the student's final thesis examination committee.

Graduate Student Advising

PhD students (mentees) are engaged in an intense period of personal and professional growth. During this period students develop into independent scientists with significant expertise in forming and addressing scientific questions. This requires focus, determination, time on task, significant technical, analytical, and personal support, and the ability to work with mentors and other team members to advance research goals.

Mentoring is an active process by which faculty advisors establish and foster structured and trusting relationships with graduate students by offering guidance, support and encouragement aimed at developing their competence and facilitating their success. Mentors are good listeners, people who care about the graduate student(s) want to help them further develop their strengths and achieve academic excellence and professional advancement.

Advising can be defined as offering constructive counsel and guidance to graduate students in order to assist them in achieving their academic and professional development goals. An advisor helps to evaluate graduate student and trainee skills and talents, and assists students/trainees in the selection of coursework and other academic and training activities that will help further their academic enrichment and professional development. Advisors also help students navigate program requirements and assess achievement of key milestones. During their time in the Pathobiology Graduate Program, students will be advised by program leadership, the thesis advisor, and the Thesis Advisory Committee. After the first year, the major advisor should be the thesis advisor with the assistance of the Thesis Advisory Committee.

Mentor-Mentee Agreement

A successful student-mentor relationship requires commitment from the student, mentor, graduate program, and institution. The Pathobiology Graduate Program encourages all student-mentor pairs to review the guidelines and examples for a successful advising agreement provided in the AAMC Mentor Training for Biomedical Researchers (2014). After reviewing the guidelines, and discussing what goals and commitments are important for both student and mentor, both parties will sign the mentoring compact.

Preliminary Qualifying Examination

The preliminary qualifying examination consists of two parts, a written exam and an oral exam. The goal of the qualifying exam is to test the student's ability to think broadly and critically about science. This involves an assessment of the student's general and specific knowledge base, the student's ability to formulate testable hypotheses, to predict experimental outcomes based on these hypotheses and to consider alternative interpretations and approaches to specific scientific questions. The written component will consist of the student preparing a detailed and specific thesis proposal written in the format of a grant application. The proposal length should follow the current NIH F31 format. Outline of the sections as below may be used as a general reference point:

Title and Specific Aims Page: Provide a clear descriptive title. The specific aims page should include a brief summary of the background and significance, identify gaps in knowledge and state the overarching hypothesis, and the specific aims to address it.

Background and Significance: This section is to highlight how the hypothesis was developed and to outline the experimental approach.

Preliminary Findings are to be presented as available to support the proposed plan. Innovation section should highlight both technical and conceptual innovation of the proposed work.

Approach: For each specific aim sufficient experimental details should be provided to permit the reviewer to evaluate the probability of success of the proposed experimental plan. Expected results, pitfalls and alternative approaches should be discussed. Impact and Timeline should be outlined.

Paper format: 1 line-spacing with .5 inch margins (top/bottom and left/right) and 11-point Arial type font.

Page limitations: Title, and Specific Aims (1 page), Background (1 page max, 2 pages if includes preliminary data) Innovation less than half a page, Approach 3-4 pages for a maximum of 6 pages total (not including References).

The proposal must be shared with the thesis committee at least 2 weeks before the oral defense of the proposal. The oral exam will consist of a 30-minute seminar which overviews the rationale and design of the thesis proposal. The committee will evaluate the written proposal as well as the oral presentation. The student will then answer specific questions from each committee member about the proposal (including any relevant background information). During the oral presentation, the Committee members will interrupt with specific questions. In principle, for every 5 minutes of student presentation, the Committee will ask approximately 30 minutes of questions. During the exam, the committee will offer insights that can aid in development of the thesis project. At the end of the exam, the Chairperson will ask the student to leave the room to allow the Committee to discuss both the written and oral presentations. It is necessary to successfully defend the proposal to be promoted to 'Candidacy for the PhD' as recognized by the Graduate School. Students who fail this exam after 2 attempts will be asked to leave the program. Students who need to repeat the exam must do so by the end of their 5th semester at Brown University.

Failure/passing of the preliminary qualifying examination is determined by majority vote.

A poor performance on the written portion of the examination will result in a provisional pass with the expectation that the student undertakes a program of remedial writing. Following completion of this writing program, student will submit a revised written version of the proposal for re-evaluation by the committee.

Annual Thesis Committee Meeting

The purpose of the thesis committee is to provide a local group of experts to advise the student in various aspects of their thesis research, career and professional development as well as to provide support for mitigating conflicts that may arise between the student and their advisor. Once a student is promoted to candidacy, they will meet with their thesis advisory committee at least once each year to review their progress. Not having a thesis committee meeting in a timely manner may impact academic standing. A brief written report of progress and proposed work is prepared by the student before each of these meetings. The Chairperson of the committee will prepare a written report summarizing the meeting, and forward it to the Program Directors and Coordinator, and the student.

At each committee meeting the PI will discuss progress of the student privately with the committee members without the student present. In addition, the student will meet privately with the committee without the PI present. This is an opportunity for the student to discuss the mentoring relationship with their thesis advisor and seek advice as needed.

Thesis and Beyond

The Thesis Committee will consist of the thesis advisor, three other members of the Brown faculty and a reader external to Brown. The Committee will generally decide when the student is ready to submit and defend their PhD thesis. The written thesis should represent a comprehensive summation of the student's total research effort.

The deadline for submission and approval of a dissertation or thesis in time to receive a degree at the 2024 Commencement is May 1. Brown confers degrees in October, February, and May with its one Commencement ceremony taking place on May 26, 2024. If a doctoral student completes all of the requirements for the PhD during semester I, the tuition and fees for semester II will not be charged (even though the degree itself will not be formally conferred until the end of semester II). Students must file before the first day of classes in semester II to avoid being charged the tuition and fees for semester II.

Portions of the student's work which have progressed to manuscript form can be incorporated into the above format, e.g., a manuscript may form a chapter or part of a chapter within the 'Methods and Results' section. For all co-authored manuscripts included in the thesis, the candidate should explicitly state their contribution to the summarized work. This can be done by listing figures and tables on the title page of each co-authored manuscript to which the student contributed significantly.

The thesis will be submitted to the committee at least two weeks prior to the defense. After submission of the thesis, the student will defend it at an open presentation, followed by an examination attended by members of the Thesis Committee and other faculty members who choose to participate. Faculty members are encouraged to read each thesis submitted and to participate in the defense and examination. Specific formatting requirements of the dissertation are found on the Graduate School website.

At least two weeks prior to the final examination or defense, the following item must be submitted to the Graduate School by the candidate: Dissertation Defense Information Form.

One important component of the dissertation is the Signature Page. All PhD candidates are required to submit two paper copies of their signature page, both on archival-quality paper, to the Graduate School. However, Pathobiology alumni who have completed their dissertations recommend printing four copies for the Committee members to sign. The specialty paper is available in the Program office.

PhD candidates at Brown must file their final dissertations electronically. Brown's Electronic Theses and Dissertation (ETD) system was developed by the Graduate School and the University Library. The system is designed to collect and archive final dissertations as a text-based PDF file. Electronic dissertations submitted through the ETD will appear in the Library's discovery service and in the Brown Digital Repository. To complete the electronic submission process, doctoral candidates must have successfully defended their dissertation and had it approved by their committee. To use the ETD system, doctoral candidates must possess a valid username and password for accessing Brown's computer network.

SUBMISSION OF THE FINAL COPY

When the dissertation is presented to the Graduate School electronically, it must be in its final form. Dissertations may require revision after their original presentation if it is determined by the Graduate School that the dissertation does not conform to the standards articulated above. The need for such revisions is not grounds for a deadline extension. If a dissertation is determined to be defective after the deadline, the Graduate School may refuse to confer a student's degree. Doctoral candidates are encouraged to submit their dissertations early, and to send questions not answered by the descriptions above, to ETD@brown.edu.

ALL completing doctoral candidates are required to submit paper copies of the documents listed below directly to Barbara Bennett in the Graduate School. The dissertation will not be accepted and the candidate's degree will not be conferred if an item from this list is missing or incomplete. The online submission system will send notifications when each document has been received and approved by the Graduate School.

1. A receipt ("Letter of Clearance") from the Bursar indicating that all outstanding debts, the $50 dissertation fee, and the $150 filing fee (if applicable) have been paid.
2. Ph.D. Exit Survey, Brown University Graduate School must be completed online.
3. Survey of Earned Doctorates, National Research Council
4. Two extra copies of the title page
5. One loose and unnumbered copy of the abstract

THE DIPLOMA

The Office of the Registrar's *Application to Graduate* provides the candidate with an opportunity to indicate how the diploma name should appear. Otherwise, the name that will appear on the diploma and in the Commencement program, and under which the Library will catalog the dissertation, is the name under which the candidate is officially registered. Any request for a change of registered name should be addressed to the Office of the Registrar and accompanied by legal proof (marriage certificate or court order).

CERTIFICATE OF COMPLETION

If all academic requirements for the degree and all financial obligations have been met before April 1, the Office of the Registrar will issue a certificate of completion within three weeks of the candidate's request. If you have any questions regarding the submission of your dissertation or thesis, please contact the Graduate School's Academic Manager, Barbara Bennett, 401-863-2843.

Commencement

Commencement exercises are scheduled for Sunday, May 26, 2024 and to participate in this event, eligible graduate students need to take several steps:

1. Fill out the Application to Graduate on self-service Banner by April 1 (Registrar's requirement).
2. Register for Commencement by April 1 (Graduate School requirement).
3. Rent or purchase academic regalia by April 1.
4. Plan to attend rehearsal on Saturday, May 25, at 2:00pm.