

BROWN UNIVERSITY
NEUROSCIENCE GRADUATE PROGRAM

Organization and Policies

2011-12

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1. General Description

The Graduate Program in Neuroscience (NSGP) at Brown University provides advanced study for academic and research careers in neuroscience. Students receive broad, multi-disciplinary training in neuroscience with a strong foundation in core concepts, skills, methodologies, and advanced scientific literature. Students take a core curriculum that encompasses multiple levels of analysis including genes, cells, systems, cognition, translational neuroscience, and neurological diseases. At all stages of instruction, we integrate skills that are considered essential for successful, independent research careers in neuroscience. These skills include critical thinking and reasoning, effective science writing and oral presentation, knowledge of scientific review processes, and ethics training. Admission is limited to applicants for the degree of Doctor of Philosophy in Neuroscience.

To fulfill the Program's requirements, students must pass all courses with a grade of "B" or higher, pass the Comprehensive Examinations at the end of their first two semesters, propose and defend a thesis topic (Preliminary Examination), and complete and successfully defend a doctoral dissertation. The thesis, which describes the student's original research, should contribute significantly to the field of study and be of sufficient quality to merit publication in a peer-reviewed journal. Students must also serve as teaching assistants for one course during one semester and participate in other Program activities (See Section 6).

2. Admission to the Neuroscience Graduate Program

The Admission Committee is comprised of the Director or Co-Director of the Program, one senior faculty trainer, one junior faculty trainer, and the Graduate Student Representative. The committee must include faculty from at least two different departments. The Admission Committee reviews all applications, and all Program faculty have access to graduate student applications. The Admission Committee generates an interview short-list based on their assessments, along with solicited comments and rankings from all faculty. Applicants are interviewed and recommendations for admissions are made based on post-interview rankings and availability. The Program Director keeps faculty informed at all stages of the admissions process.

Application materials are due to the Graduate School by December 5, 2011, for September, 2012 entry. Matriculating students are expected to have an undergraduate degree in a scientific discipline such as Biology, Psychology, Neurobiology/Neuroscience, Chemistry, Physics, Applied Math, Engineering, or Computer Science. Candidates whose undergraduate training does not include certain topics critical to their research interests may take additional courses as part of their program of study.

3. Coursework

All students take the following core courses during their first year of study:

*NEUR1650 or *BIOL3652	Structure of the Nervous System Human Neuroanatomy Section I of Integrated Medical Sciences II	ABC/NC ABC/NC
NEUR2030	Advanced Molecular & Cellular Neurobiology I	ABC/NC
NEUR2040	Advanced Molecular & Cellular Neurobiology II	ABC/NC
NEUR2050	Advanced Systems Neuroscience	ABC/NC
NEUR 2060	Advanced Cognitive Neuroscience	ABC/NC
NEUR2010	Graduate Proseminar in Neuroscience	S/NC

NEUR2020	Graduate Proseminar in Neuroscience	S/NC
NEUR2980	Graduate Independent Study I - Section 15	S/NC
NEUR2980	Graduate Independent Study II - Section 15	S/NC

* Students take either NEUR1650 or BIOL3652

To satisfy any course requirement, students must receive a grade of A or B. Lower grades (C and NC) will require remedial or other action including Academic Warning. In addition, all first year students take a two part Comprehensive Exam (see Section 8) based largely on the content of the core courses.

Second and third year students take the following courses:

NEUR2010	Graduate Proseminar in Neuroscience	S/NC
NEUR2020	Graduate Proseminar in Neuroscience	S/NC
NEUR2980	Graduate Independent Study I	S/NC
NEUR2980	Graduate Independent Study II	S/NC

In addition, all second year students must be proficient in Statistics. Students may take one of several graduate level (2000 level) statistics courses offered at Brown. The most popular courses are offered by the Department of Cognitive, Linguistic and Psychological Sciences (CLPS2906 - Experimental Design), the Public Health Program (PHP2510 - Principles of Biostatistics and Data Analysis), and the Department of Applied Mathematics (AMPA2610 - Recent Applications of Probability and Statistics). Students who enter the Program with substantial background knowledge in statistics may petition the Program Director to waive this requirement.

Second year students and beyond may also select from a large number of courses and seminars offered by the major departments in the program including Neuroscience, Cognitive, Linguistic and Psychological Sciences, Applied Mathematics, Engineering, Molecular Biology, Cell Biology and Biochemistry, and Molecular Pharmacology, Physiology and Biotechnology. These courses are chosen to enhance students' laboratory research experience.

In addition to Program requirements, Brown University Graduate School requires students to complete 24 course credits before graduation. Typically these credits are earned within the first three years of study.

4. Advising

Students start laboratory rotations in the fall of their first year. The faculty advisor from that laboratory serves together with the Director, Co-Director, or a designated faculty member as the students first year Advisory Committee. The faculty advisor meets with the student at the beginning of the first semester to provide general training oversight. The Advisory Committee meets in early March to discuss progress in course work, laboratory rotations, fellowship applications, and general program information. Advisors summarize the student's progress after each advisory meeting, using an electronic form which can be found at <http://neuroscience.brown.edu/graduate/forms/>.

Typically, students select their dissertation advisor prior to the start of their second year of study. This decision must be approved by the Program Director. The Thesis Advisor is the first member of the student's Thesis Committee. The student and Thesis Advisor then select two additional faculty members to serve as the Thesis Committee. These faculty must be approved faculty trainers in the Neuroscience Graduate Program, and at least one committee member must be

an Associate or Full Professor. In addition, the chair of the Thesis Committee must be someone other than the Advisor. Students and Advisors may invite faculty who are not trainers in the Neuroscience Graduate Program to participate in committee meetings. These faculty can add to the scientific discussion, but are not voting members of the committee.

In the student's second year, the committee primary focuses on helping the student prepare for the Preliminary Exam (see Section 9), which should occur before the start of the third year of study. After the Preliminary Exam, the Thesis Committee primarily guides the dissertation plan. All students are strongly encouraged to publish, present their findings at the Society for Neuroscience annual meeting, take summer methods courses, and apply for individual predoctoral fellowships. The Thesis Committee must meet with the student annually to evaluate the progression of the thesis research. After each meeting, the Thesis Committee chair must complete and submit an update form: <http://neuroscience.brown.edu/graduate/forms/>.

At least once each year, graduate students will meet as a group with the Program Director and Co-Director. These meetings are intended to keep students informed about the development and organization of the Program and provide an opportunity for student feedback concerning financial support, teaching responsibilities, Program requirements, and other issues of mutual concern. In addition, students are encouraged to meet individually with the Director or Co-Director to discuss their progress in the Program and general programmatic affairs.

5. Laboratory Rotations and Research

A crucial responsibility for new graduate students is to choose a research area and a Thesis Advisor from the current Training Faculty. In order to gain sufficient knowledge to make an informed thesis lab selection, students interview with faculty, attend seminars and lab meetings, and complete lab rotations. A lab rotation consists of a one semester research project under the supervision of a Program faculty member. Students are required to complete two lab rotations (and encouraged to do a third rotation during the summer following their first year). Students wishing to rotate in labs outside of the Neuroscience Graduate Program must submit their request in writing to the Program Director who will review the request in consultation with other faculty trainers. If appropriate, the faculty member can be added to the list of faculty trainers after review by the Steering Committee (see Section 13). Only faculty approved by the Neuroscience Graduate Program Steering Committee can serve as full time thesis advisors.

Laboratory research should be arranged and underway by the first semester of the first year. In special cases, a student may delay the onset of lab work until after the first semester with approval from the student's advisory committee and Program Director or Co-Director. In such cases, the student is expected to establish a meaningful scientific relationship with a member of the training faculty and attend weekly lab meetings in preparation for their rotation during the second semester. All students are expected to work in a lab during the winter intersession and summer, except for a reasonable vacation interval

6. Graduate Program Activities and Events

A number of special Graduate Program activities and events are integral to graduate training, and students must arrange their schedules to participate.

- **Retreat**: A one-day retreat for the Neuroscience Graduate Program is held every year, usually during the week preceding the start of the academic year. The purpose of this retreat is to introduce the incoming graduate student class and familiarize students with Neuroscience faculty research, particularly faculty trainers. The retreat is organized and

arranged by a committee consisting of the Graduate Student Representative, one faculty member, and several graduate students.

- The Graduate Proseminar in Neuroscience (NEUR 2010) is intended to expose graduate students to the latest work in key fields of neuroscience. All students must attend these weekly seminars on Thursday at 4 PM. An informal social with the invited speaker follows the seminar and students are strongly encouraged to attend. Each year, outside speakers are chosen by the Colloquium Committee (see Section 12) with input from graduate students who select two speakers to invite and host. Also, one student is assigned to set up and operate the audiovisual equipment for the seminar and assist with refreshments each week.
- In-House Seminars and Journal Clubs: Second year students and beyond are required to present at the In-House Seminar Series and are expected to join one of the ongoing Journal Clubs in a topic of their choice. All first year students are required to attend In House Seminars and may also attend Journal Club if their schedule permits.
- Weekly Laboratory Meetings: Every research laboratory conducts weekly meetings and graduate student attendance is required for a passing grade in NEUR2980. Students must inform their advisor if, for any reason, they cannot attend.
- Ethics and Skills Workshops: All first and second year students are required to attend the Ethics and Skills Workshops offered by the Program as well as a seven week series conducted by the Division of Biology and Medicine entitled, The Ethics of Responsible Conduct in Research. These workshops are designed to foster skills necessary for a successful career in research. As a refresher, fourth year students must take the Brown Ethical and Responsible Conduct of Research Education (BEARCORE) program, offered in January and September each year.
- Graduate Student Recruitment: Recruitment is essential for program vitality. Students assist in recruiting new students to the Program each year. The Graduate Student Representative helps to coordinate recruitment efforts and establishes a committee of students responsible for organizing social events.

7. Teaching

Students serve as teaching assistants for one semester in their second year. A second semester of teaching assistantship is optional. This teaching requirement ensures that students understand the importance of, and challenges associated with, teaching in the academic setting. Students do not teach courses on their own, but are paired with a Program faculty member who is responsible for the course. As a teaching assistant, students dedicate approximately 6-8 hours/week to teaching during the semester (approximately 15 weeks). Students must have a substantive teaching experience (conducting discussion sections, leading laboratory sections, or giving lectures) beyond simply grading examinations or supervising course paperwork. The Program Director assigns teaching assistant positions taking into account the preferences of graduate students as much as possible.

8. First Year Comprehensive Exams

The Comprehensive Exams are taken at the end of each semester during the first year of study and must be passed to qualify for Ph.D. candidacy. The exams are designed to ensure that students have attained core knowledge in Neuroscience and incorporate all the material

covered in the first year coursework, including neuroanatomy, ionic basis of excitability, synaptic transmission, neural development, systems neuroscience, and cognitive neuroscience. All first year students in a given class sit for the same closed-book essay exams. Committees of at least four faculty members grade each exam. This grading system maintains uniformity in the evaluation process from year to year and provides a better overview of the students' mastery of the course material. The Comprehensive Exams are also used to diagnose and recommend additional readings or electives for the second year of study. The committee may call for an oral examination of those students whose written answers reveal a serious deficiency. If students provide adequate answers in this oral exam, they pass the Comprehensive Exams. However, students who fail the oral exam must re-take the Comprehensive Exam or re-take the associated course. Failure of more than one course or one course repeatedly results in academic warning and possible dismissal.

9. Preliminary Examination / Thesis Proposal

The Preliminary Examination is administered by the Thesis Committee. Before the beginning of the fifth semester, students must present a written research proposal to the Thesis Committee. This written research proposal should be formatted as an NIH R01 grant application. The proposal must include the specific aims, significance, background (a critical review of the relevant literature), experimental or analytical design, and detailed methods of the proposed research within a maximum of 50 pages double spaced. The Thesis Committee chair is responsible for notifying the student if the written proposal is not acceptable.

When the written research proposal is accepted, students must present a 20-30 minute talk to the Thesis Committee summarizing their proposal and experimental plan. Students should be prepared to answer many questions from their Thesis Committee and defend their experimental plan. A successful project defense constitutes passage of the Preliminary Examination. When students complete all required courses and pass the Comprehensive and Preliminary Examinations, they advance to candidacy for the Ph.D. The Dissertation Defense cannot take place within one year of the Preliminary Examination.

10. Dissertation Preparation and Defense

Upon the completion of their thesis research, students are required to write a doctoral dissertation to submit to their Thesis Committee for evaluation and minor revision. The appropriate format for the written dissertation is described at the Brown University Dissertation Guidelines web site (<http://www.brown.edu/gradschool/academics-research/rules-regulations/dissertation-guidelines>). Before the thesis is submitted to the Committee, the student and Thesis Advisor must ensure that the thesis is complete and the Committee has adequate time to read it. At this stage, a qualified outside reader with relevant expertise is invited to join the Thesis Committee. The outside reader may be a faculty member from another University or hold an equivalent position in a research institution (e.g. Senior Investigator at the NIH) other than Brown and its affiliated institutions.

The thesis will form the basis for a public seminar that must take place at Brown University. A closed oral examination attended by the Thesis Committee and other interested Neuroscience Graduate Program faculty will follow the seminar. This final examination or defense must be scheduled by the candidate at the convenience of the readers. At least four weeks notice must be given to all faculty and students prior to the final defense date and at least two weeks must elapse between submission of the written thesis to the Thesis Committee and the final defense.

Three weeks prior to the defense, candidates must provide the Neuroscience Graduate

Program with appropriate dissertation defense information so the Thesis Defense Form can be completed and returned to the Graduate School. The following information is required:

- The names of the dissertation advisor and all readers (with contact information for anyone who is not at Brown University).
- The date, time, and place of the final examination. In some departments this information will come from the manager or the director.
- All of the candidate's previous academic degrees, with institutions and dates of conferral.
- Date of preliminary examination.
- Language requirements, including when and how they were fulfilled.

On the day of the thesis defense, candidates will need at least two copies of their signature page printed on archival-quality paper. Immediately following the thesis defense, candidates must obtain the signatures of their Thesis Committee members to complete the Thesis Defense Form and signature page.

After the thesis defense, the final doctoral dissertation and all associated forms and documents related to the completion of a Ph.D. must be submitted to the Graduate School by the first business day of May (May 1, 2012) in order to graduate in the academic year (2012). Please consult the Dissertation Guidelines from the Graduate School at: <http://www.brown.edu/gradschool/academics-research/rules-regulations/dissertation-guidelines> for forms, documents, and additional information regarding the thesis defense process.

11. NIH/Graduate Partnerships Program

A handbook that addresses information specific to the Brown-NIH Graduate Partnership Program (GPP) is available and should be reviewed by all GPP students and their committees.

12. Governance

The Graduate Program in Neuroscience is supervised by the Program Director. The Program Director and Co-Director are senior faculty members appointed for a three-year term by the Steering Committee in consultation with the Department of Neuroscience Chair. The Director works with students, the Co-Director, the Steering Committee, faculty trainers, and Advisory Committees to operate the Program. In conjunction with the students, the Program Director annually appoints a Graduate Student Representative to serve as a liaison between the student body and the Program.

The **Steering Committee** serves as an advisory board to the Director and Co-Director of the Neuroscience Graduate Program and is comprised of five members: The Chair of the Department of Neuroscience, (Dr. Barry Connors), the PI of the training grant, (Dr. Diane Lipscombe), the former Director of the NSGP (Dr. Michael Paradiso), a current or former Chair or Graduate Program Director of a Department other than the Department of Neuroscience, (Dr. David Badre) and a representative of the junior faculty (Dr. Gilad Barnea). The Steering Committee has a number of responsibilities including advising the Director and Co-Director, reviewing the status of current faculty trainers, reviewing applications from potential new trainers, selecting the External Advisor, considering complaints and concerns of trainers related to programmatic issues, and addressing trainee-mentor problems that are not readily resolved by the Program Director.

Four committees oversee admissions and the graduate curriculum:

- The **Admissions Committee** receives and reviews applications for annual admissions to the graduate program.
- The **Curriculum Committee** oversees proposed changes to the graduate curriculum.
- The **Special Events Committee** organizes the annual events that bring together all members of the Program. The three major events are the annual NSGP retreat at the start of the academic year and the two recruitment weekends.
- The **Colloquium Committee** selects speakers for the NSGP seminar series held every Thursday at 4 PM.

The **External Advisor** is a senior faculty member from another University that serves as an external reviewer of the graduate program. The External Advisor will visit Brown to review the program at least once every two years. Annual visits may become required, and ad hoc consultations may occur at any time. During on-site visits, the External Advisor meets with students, faculty, post-doctoral fellows and selected Administrators in the Division of Biology and Medicine as well as the University. The goal of these visits is to identify areas for improvement and areas of success in training graduate students. The External Advisor provides a written report of the visit. Dr. Eve Marder, Professor of Biology at Brandeis University, made her last visit to Brown on March 24, 2010.

13. Faculty Trainers

Individuals are designated as Program Faculty Trainers by the Steering Committee. Faculty members seeking such designation should submit a Curriculum Vitae, a description of their current research interests, current funding sources, and an account of their past training history to the Program Director for review by the Steering Committee. Appointment as a Program Faculty Trainer is based on an assessment by the Steering Committee of the faculty's potential to contribute to the Program. Continued membership as a Program Faculty Trainer is contingent upon a visible contribution in the areas of teaching, advising, training, or Program administration.

There are two categories of trainers: Full Trainers and Provisional Trainers. Full Trainers meet all criteria listed below and can serve as a mentor to a graduate student. Provisional Trainers meet most but not all criteria below. For example, a faculty member may hold provisional trainer status if they have not yet secured stable funding to accept a graduate student into their lab full-time. Provisional trainers can accept graduate students for laboratory rotations only and cannot serve as full-time mentors. A provisional trainer may request full trainer status from the Steering Committee once they meet the criteria listed below.

The training program maintains strict requirements for the inclusion of faculty as trainers while at the same time encouraging the participation of junior faculty and other senior faculty distributed throughout the University system. The Steering Committee will annually review all current and prospective trainers and add or remove trainers according to the criteria below. A full trainer in the NSGP must have:

- An active, ongoing basic neuroscience research program.
- Active participation in training activities.

- Have a record of successfully training graduate students. Junior faculty with no prior training experience are eligible, provided that they show exceptional promise as independent scientists and trainers. In these cases, a mentor will be assigned to junior faculty sponsors.
- Have adequate research support to provide stable funding for the trainee, as well as an appropriate laboratory environment.
- Have the ability to provide instruction in the Core Curriculum or otherwise participate in a Neuroscience-related course in the Brown course offerings.

Individuals denied membership in the Program Faculty or approval as a Thesis Advisor may appeal the Steering Committee's decision, by way of the Program Director. In addition, the Training Faculty can override the Steering Committee's decision by a majority vote. Sixty percent of the active training faculty will constitute a quorum for such a vote. This vote will be reflected in the written minutes of the meeting at which it is taken. Members unable to attend this meeting may vote via a written statement to the Program Director. In this instance, faculty members not attending the meeting will become counted for quorum purposes.

14. Graduate Student Grievance Procedures (FRR Part 4 Section 10.II.A.)

Mediation:

- Every graduate student is entitled to a fair and prompt hearing of grievances. Before invoking this procedure, however, a student who believes himself or herself to be aggrieved must first attempt to resolve the difficulty through discussion with the other person or persons involved.
- If no resolution can be effected by direct discussion, and the student wishes to pursue the matter further, he or she must then address either the Program Director, a senior faculty member (Representative), or the Chair of the appropriate department, with the aim of securing clarification and advice. The Program Director, Representative, or Chair shall then discuss the matter informally with the several parties and attempt to resolve it by mediation.
- The Program Director, Representative, or Chair shall also prepare a memorandum outlining the problem, steps taken, and proposed resolution. Copies of the memorandum shall be given to all persons involved.
- If a mutually satisfactory solution is not achieved by mediation, and the student wishes to pursue the matter further, then the Program Director, Representative, or Chair shall make a determination as to whether the question at issue is or is not departmental in nature.
- If it is determined to be departmental, the student may then file a written request for a review with the Chair of the department (see below - #2 Grievance Procedure); if not, no further action is taken at the departmental level.
- A student who disagrees with such a determination may appeal it to the Dean of the Graduate School, whose decision shall be final.
- A student who has been unable to resolve a non departmental question by personal effort may also make appeal to the Dean of the Graduate School, in this case with a view to securing advice and direction.

Grievance Procedure:

- If an unresolved grievance has been determined to be departmental, and the student wishes to pursue the matter further, he or she must, within a reasonable period of time, file a written appeal with the Chair of the appropriate department. This appeal must ask for review of the question and must specify the alleged injury, the reasons for the student's belief that he or she is aggrieved, and the remedy sought.
- The Chair, within a reasonable period of time after receiving an appeal, shall refer it, depending on its nature, either to a committee of review or to the departmental Faculty (see the following paragraphs). A student who believes that any procedure outlined in this section has not been carried out within a reasonable period of time may appeal to the Dean of the Graduate School for a determination of this allegation.
- If the grievance involves any question except that of a change in the degree for which the student is enrolled, it shall be referred to a committee of review, to be named by the Chair. This committee must include the Chair (unless he or she is the object of the appeal), at least two other faculty members, and at least one graduate student member; when the exercise of academic judgment is required, the student member or members shall be non-voting.
- As expeditiously as possible, this committee of review shall hear the student, consider the evidence, confer with other persons concerned, and prepare a comprehensive report of findings and a majority vote of the members. It shall be the Chair's duty to carry out, so far as may be, the directions of the committee for the official record, either by the Chair or by a designated member of the committee, and a copy given to the student.
- If the grievance involves the question of a change in the degree for which the student is enrolled, it shall be referred to the regular faculty of the body to present his or her case, and may request the support of such witnesses or advisers as are deemed necessary by the student and the presiding officer. At the invitation of anyone personally involved in the appeal, the Dean of the Graduate School may, at his or her discretion, appoint members of the Graduate Council to act as observers. If a student's record is to be discussed in the presence of people other than officers of the University, the student must supply such waivers and take such steps as are necessary to satisfy the provisions of the Family Educational Rights and Privacy Act when the subject-matter requires confidential treatment.
- Minutes consisting of a summary of the proceedings of the appeal shall be kept, and copies supplied to the student and the Dean of the Graduate School. Decisions shall be by simple vote of the majority and shall be taken in a closed session; they shall be made known in writing to the student by the Chair of the department as soon as possible after a decision has been reached.
- Subsequent appeal of the decisions of the committee of review or of the Faculty of the department may be made to the Graduate Council on the ground that the grievance was not given an impartial and proper hearing. The Council shall consider such an allegation within a reasonable period of time after receiving it. If the Council determines that the student's complaint is justified, it shall ask to have the matter reconsidered by the department, itself monitoring, if necessary, the procedure.

Definitions and general provisions:

- Whenever the word "department" is employed herein, it shall be understood to include Divisions and Programs where applicable.

- Whenever the word "Chair" is employed herein, it shall be understood to include Divisional Deans and Program Directors where applicable.
- Whenever a Chair or a Graduate Representative is the object of an appeal, he or she should step aside and request the department to name a locum tenens.
- When an appeal is made in a department which, by reason of insufficient number of available faculty, finds that it cannot carry on the described procedure, this circumstance shall be made known by the Chair to the Executive Committee of the Graduate Council, which shall devise a special procedure for hearing the appeal, following as closely as practical the model of the regular procedure. The special procedure may involve the ad hoc enlistment of faculty members from other departments or from the Graduate Council itself.