Georgetown University

Interdisciplinary Program in Neuroscience

Graduate Student Handbook

Revised and approved by the IPN Executive Committee October 2017

Disclaimer: The guidelines in this document are meant to be helpful. Although every attempt was made to ensure accuracy, some material may be out of date or potentially wrong. Thus, this document is not meant to represent a binding contract between faculty and students.
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The faculty, current students and staff welcome you to the Interdisciplinary Program in Neuroscience (IPN). We all hope that the next 4-6 years of your life in the IPN will be filled with academic success and scientific discoveries. This handbook is meant to give you a guide for what to expect from the program and how to proceed. For the best of times and the worst of times, there are answers to your questions and people to help. Feel free to peruse this handbook and get a feel for what is expected of you and the resources available to you. If you have questions or suggestions, we welcome them.

**Student Timeline (Academic year July 1 – June 30)**

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<td>Enter program</td>
<td>Classes begin at the end of August</td>
<td>Attend IPN retreat</td>
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<td>Attend Summer Course</td>
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<td>Give 2nd rotation talk</td>
<td>Written Comprehensive Exam</td>
<td>Medical Neuroscience begins</td>
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<td>Start 3rd rotation</td>
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<td>Give 3rd rotation talk</td>
<td>Thesis lab should be chosen before start of 2nd year classes</td>
<td>Attend IPN retreat</td>
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<td>1st semester classes end</td>
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<td>Start research in thesis lab or begin 4th rotation</td>
<td>Classes begin at the end of August</td>
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<td>Begin preparing for oral exam, based on research in thesis lab</td>
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<td>2nd semester classes begin</td>
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<td>Prepare and give 1st neurolunch talk</td>
<td>Oral Comprehensive Exam must be completed</td>
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<td>Schedule committee meetings</td>
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<td>Write and defend dissertation</td>
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Degree Requirements

The PhD is an academic research degree, and the development of a research project in conjunction with an IPN mentor is essential. In addition, there are a number of curricular requirements which must be fulfilled. In pre-thesis years, all students in the IPN are required to maintain at least a 3.0 grade point average. Journal Club and Research Seminars must be attended. Students must accumulate at least 40 credits (including any transfer credits) combined from 26 required course credits and at least 14 elective credits (see page 3); these credits do not include research rotations. A written comprehensive and oral qualifying examination must be passed before entering thesis research. During thesis research, students are expected to attend at least one relevant journal club and research seminar series regularly until completion of the program. Regular progress in research is required, and will be evaluated by the research mentor, the Thesis Committee and the Student Advisory Committee (SAC). In certain areas, IPN performance requirements exceed those described in the catalogue for The Graduate School of Arts & Sciences.

Program of Study

Predoctoral trainees in the IPN are enrolled in the Graduate School of Arts and Sciences at Georgetown University and follow a program of study that leads to the PhD in neuroscience.

Training of PhD students in neuroscience is based on a combination of required and elective didactic course work, formal interactive learning situations (Critical Readings Course, Journal Club, Seminar, Neurolunch), more informal student-faculty interactions experienced during Laboratory Research Rotations and, most importantly, the student-mentor interactions through which the Thesis Research is directed. Coursework and laboratory research rotations are accomplished during/within the first two years of the Program. Before the end of this period (as early as the beginning of the second year), a Thesis Mentor and an area of Thesis Research are identified. Although no credits are given for Neurolunch and Seminar, these activities are required for all students.

Portions of the program are intended to aid in the preparation of individual grant applications. During the summer and fall of the first year, eligible PhD students are required to apply for a National Science Foundation graduate research fellowship. Resources and mentoring are provided to help in these submissions. NIH NRSA applications are developed from the oral qualifying exam (see below). Other coursework helps develop skills for competitive research grant applications.

The training needs of each PhD student are unique, especially after the first year. Therefore, a specific curriculum and training plan will be developed by each student with the advice and approval of the SAC, the Program Director, and, when chosen, the Thesis Mentor. In the first year, students will create an Individual Development Plan based on the model from AAAS (http://myidp.sciencecareers.org). This plan will inform the training portion of the Qualifying Exam in year two, and be reviewed each year by the thesis committee as training and career plans evolve.

Curriculum & Coursework Requirements

The curriculum of the typical student in the IPN is composed of a mix of didactic coursework, research, and skills-related (non-didactic) learning experiences for which credit is earned. The 40+ credits are distributed between required coursework in the first year and elective coursework in the second year. Please refer to http://neuroscience.georgetown.edu/electives.html for a current list of electives.

The online list of electives is not exhaustive. Electives may also be taken in other departments on campus, and through the consortium. If a student would like to propose a new elective course, they are encouraged to discuss with a faculty member who may be interested in leading that course and subsequently receive approval from the IPN Curriculum Committee. Additionally, a student may take an elective at the undergraduate level as long as it is taken as a "tutorial" with a written statement from the course director that additional work will be required of the student to make it graduate level. A tutorial form must be completed with permission and signatures from the Director of the IPN, and the Dean of Biomedical Graduate Education.
Coursework Requirements for Years 1 and 2:

Please refer to http://neuroscience.georgetown.edu/timeline

Summer, Year 1
(0 credits total)
Laboratory Rotation #1
Summer Course & Boot camp
Neurofest

Fall, Year 1
(12 credits total)
Laboratory Rotation # 2
Seminar, Neurolunch and Journal Club (required, no credits)
Core Courses in Neuroscience (NCSI 501, 6cr)
Recitation for NSCI501 (NSCI 511, 1cr)
Neuroanatomy (NSCI541, 1 cr)
Neuroscience Survey Course (NCSI 505, 2cr)
Neuroscience Critical Readings (NCSI 507, 1cr)
Neurobiology of Disease I (NSCI 533, 2cr)

Spring, Year 1
(12 credits total)
Laboratory Rotation #3
Seminar, Neurolunch and Journal Club (required, no credits)
Core Courses in Neuroscience (NCSI 503, 6cr)
Neuroscience Critical Readings (NCSI 507, 1cr)
Recitation for NSCI503 (NSCI 511, 1cr)
Neuroanatomy (NSCI543, 1 cr)
Survival Skills & Ethics for Emerging Scientists (NCSI 532, 2cr)

Summer, Year 2
(0 credits total)
Begin thesis research (or Laboratory Rotation #4, if necessary)

Fall, Year 2
(9 credits total)
Seminar, Neurolunch and Journal Club (required, no credits)
Elective Coursework (1-9cr)*
NSCI 999-03 (0cr, confers full-time status to those enrolled in fewer than 9 course credits)

Spring, Year 2
(9 credits total)
Seminar, Neurolunch and Journal Club (required, no credits)
Elective Coursework (1-9cr)*
NSCI 999-03 (0cr, confers full-time status to those enrolled in fewer than 9 course credits)

*By end of Spring Year 2, an additional 16 elective course credits must be completed to fulfill degree requirements. A Statistics requirement must be met by this time (see page 5).

Total credit hours ≥ 40

After completion of coursework, students are still required to participate in the following activities throughout the year:
full-time Thesis Research, weekly attendance of one or more journal clubs (e.g., neurobiology, cognitive neuroscience, neural injury and plasticity), NeuroLunch, and weekly seminars sponsored by the IPN and Neuroscience department. The doctoral dissertation typically should be written and defended during Years 5 and 6.
Description of Required Courses

NSCI-501, 503, Core Courses in Neuroscience (12 credits total, graded): A one-year series of courses designed to introduce basic concepts in neuroscience and the experimental strategies that have been used to achieve our current awareness of the structure and function of the nervous system. Successful completion of the Core Course (80% or better on each exam) is required for qualification to sit for the written comprehensive exam at the end of the first year. The Core Course focuses on the following distinct areas:

Cell Biology and Neuropharmacology: Principles of development of the nervous system during embryogenesis and the early postnatal life to the mechanisms of regulation of neurotransmitter utilization and second messenger responses. Lectures will cover the birth of neurons and glia, neuronal migration, axon guidance, target selection, naturally occurring neuron death, synaptogenesis, and refinement of neuronal connections. Presynaptic mechanisms of transmitter synthesis, release and degradation, as well as postsynaptic receptor-mediated responses are considered in the context of specific neurotransmitters and second messenger systems and their response to acute and chronic exposure to drugs.

Neurophysiology: The biophysical and physiological aspects of neuronal function. Postsynaptic potentials, structure and function of ion channels, action potentials, transmitter release, saltatory conduction, gap junctions, long-term potentiation, and neurophysiological measurement techniques are considered as a basis for understanding the dynamic function of neural networks and how they are regulated.

Organization and Function of Sensory Systems: An overview of the functional anatomy of the normal adult vertebrate nervous system with special emphasis on the major structures and pathways that subserve sensory and perceptual functions are considered from the peripheral receptors/effectors through the level of behavioral response.

Organization and Function of Motor Systems: An overview of the functional anatomy of the normal adult vertebrate nervous system with special emphasis on the major structures and pathways that subserve motor function are considered from the level of the cortical, subcortical and cerebellar circuits including the spinal cord, motor neurons, and the neuromuscular junction.

Regulatory Systems: Autonomic and endocrine systems important for maintenance of sleep and waking and homeostasis, and their regulation by limbic system networks. Endocrine and hypothalamic/brainstem control of salt/water balance, thermoregulation, appetite, reproductive behavior, cardiorespiratory function, immune function and circadian/ultradian rhythms will be discussed and related to regulation of mood and emotion by limbic system circuits.

Cognitive Neuroscience I & II: An overview of how the brain gives rise to cognition. Lectures cover methods of cognitive neuroscience such as EEG and fMRI, attention, executive function, learning and memory, development, language, social and affective neuroscience, reasoning and cognitive neurogenetics, cognitive aging, as well as labs in animal models of cognition and human psychophysics.

NSCI-511 & 513 Recitation for Core Courses (1 credit each, pass/fail): All students registered for NSCI501 or 503 are required to take this course, which ties together the disparate information in the various modules of the core course. You must attend 75% of classes and participation is required.

NSCI-507 Critical Readings in Neuroscience (1 credit, pass/fail): With facilitation by a faculty member, students read and critically evaluate current research literature. The papers are read in conjunction with the individual modules in the Core Neuroscience course. These papers of original research are critically analyzed with the participation of all students in a case-based learning style where the research article is treated as a “case.” Analysis is conducted by identifying the “given” facts from previous research, the authors’ hypotheses, and critical examination of the methods (experimental design) and results.

NSCI-505 Neuroscience Survey (2 credits, graded): This course provides a survey of current neuroscience research underway at Georgetown University. Faculty and students from the IPN will participate in this course as presenters or discussants. This course is intended to help students prepare a research proposal for agencies such as NSF, foundations, and NIH. Students enrolled in this course will prepare a mini-grant proposal on a research topic chosen in consultation with the course director and a faculty member with expertise on the topic.
NSCI-533 & 534 Neurobiology of Disease I & II (1 credit each, pass/fail): In this course, a clinical understanding of neurological and psychiatric disorders will inform, enrich, and contextualize basic neuroscience education. Interactive disease-oriented problem-solving will be an organizing and assessment principle in the classroom, introducing both clinical case presentations and clinical research literature in the context of a series of basic science topics (concurrently taught in the basic neuroscience core course). Selected disease-oriented themes (e.g., Autism, stroke, Epilepsy, Alzheimer’s Disease and dementias, Schizophrenia, spinal cord injury, addiction, Parkinson’s Disease) will cut across and integrate the various levels of analysis: from genes to systems, channels to cognition, and circuits to emotions. Discussion will focus on current clinical etiological, diagnostic and therapeutic features, as well as historical perspectives and research approaches for improving diagnosis and therapy. Faculty teaching the course will be from the Georgetown Hospital, the VA Medical Center (Center for Schizophrenia and Neuroscience Research), National Rehabilitation Hospital, and Children’s National Medical Center. Students will gain an appreciation for the clinical context for their own research, ideas for novel research questions, and skills for establishing clinical collaborations.

NSCI-541 & 543 Organization of the Nervous System (1 credit each): This course covers basic human neuroanatomy. Focus is on the structure-function relationships between brain regions and human physiology, cognition, and behavior, and well as alterations associated with CNS disorders and diseases. Classes involve examination of human tissue, MRI’s, plastic models, histology slides, computer images, as well as limited lecture materials from faculty members. It is organized to examine topics in conjunction with the Core Courses in Neuroscience.

Journal Club (required, no credit): Papers selected from the current literature are presented and discussed. For Seminar Journal club (required for first and second year students), the class is held on the same day as the seminar series. When outside seminar speakers present, the journal club analyzes a paper from the speaker’s laboratory and the speaker participates in the discussion, providing an opportunity for students to interact with the visiting speaker. This has proved to be highly productive and educational for both students and speakers alike. After second year, students are required to participate in one or more regular, relevant journal clubs offered on campus.

IPN and Neuroscience Seminars (required, no credit): Invited speakers from outside Georgetown University, as well as faculty in the Neuroscience program, present formal seminars on their research. Students in thesis research continue to regularly attend seminars. Please see above for the Journal Club requirement that applies to first and second year students.

Neurolunch (required, no credit): Graduate students have the opportunity to learn the elements of preparing and presenting such a seminar. Students are expected to give one seminar each year, based initially on research performed during laboratory rotations and, in later years, on their thesis research. A portion of each presentation must address issues of research rigor and reproducibility.

Statistics (required, credits vary): ALL STUDENTS must fulfill a biostatistics requirement. This requirement may be fulfilled through a variety of mechanisms depending on the student’s background and research needs. If unsure, students should consult the Program Director, the SAC chair, and the curriculum committee chair to determine a specific course of action.
Transfer Credit and Advanced Standing

Students who have completed graduate coursework prior to entering the IPN can petition for inclusion of this coursework toward the degree requirement. A maximum of 10 eligible credits from completed coursework that did not count toward another graduate degree may be transferred with SAC and Executive Committee approval.

Students who have previously earned a Masters Degree may apply for "Advanced Standing". Students with "Advanced Standing" need only 30 coursework credits to fulfill the degree requirements. All other degree requirements still hold. If a PhD student attains advanced standing during their first year, they will be entering thesis research during their second year and thus required to have secured funding support with their thesis lab. It is recommended that any student seeking advanced standing meet first with their thesis mentor and the Director of the IPN prior to making a final decision.

Students in the Georgetown MD/PhD program are credited with 30 credits and are required to complete by the end of the first PhD year all required courses, lab rotations, and the written comprehensive exam. MD/PhD students begin thesis research after the first PhD year and are required to take the oral qualifying exam before the end of the second PhD year.

Laboratory Research Rotations

The purpose of Research Rotations in the IPN is to learn about the neuroscience problems being addressed and the strategies and methods employed in different laboratories. The rotations expand the student’s familiarity with areas and techniques in research and may assist the student in choosing a laboratory and mentor for dissertation research. Students should initiate communication with potential lab PIs ahead of time to coordinate rotations. Potential rotation mentors can be identified with information from interviews, Neurofest talks, the IPN website, etc. At least three rotations with three separate mentors are required. PhD students perform three research rotations during 1) summer prior to the first year of coursework; 2) fall semester and 3) spring semester of the first year. MD/PhD students are encouraged to perform research rotations during the summers before their first two years of medical school and in the summer prior to the year of graduate coursework. These should expose the student to a variety of experimental approaches and in each case, the rotation and specific objectives must be approved by SAC prior to initiation. At the completion of the rotation, the student must submit a brief summary of accomplishments to SAC. This summary, along with an evaluation of the student’s performance by the rotation mentor is retained in the student's file (see https://neuroscience.georgetown.edu/forms.html). Students will make a presentation about each rotation at the annual retreat, Neurolunch and Neurofest, respectively. The SAC will determine the success or lack thereof based on reports from the rotation mentors, which could affect a student’s standing in the program especially in cases where other problems have been identified.

By July 1st, the beginning of their second year, the student may start research in their chosen thesis laboratory. If needed, a fourth rotation may be completed during this summer, however a thesis laboratory should be identified before starting second year coursework. Identification of a thesis laboratory is necessary before preparation of the second year oral qualifying exam can begin.

Off-campus Rotations: Due to the volume of activities and course work that take place during summer, fall, and spring of the first year, rotations during these times should take place in labs of Georgetown University faculty. Off-campus rotations must be pre-approved by the SAC chair; therefore please plan and get approval from the chair at least one month prior to the beginning of the rotation.
**Examination Guidelines**

The purpose of this two-part examination is to evaluate students on their basic knowledge of neuroscience and their analytic and synthetic abilities in critically reading scientific literature, formulating testable hypotheses and designing experimental strategies.

The examination includes two components. A written comprehensive exam is taken after the Neuroscience Core course has ended (May of first year), and an oral qualifying exam is taken any time during the second year before June 30. The examining committee will assign the student a Pass or Fail grade on each part, to be approved by the SAC. If a student fails, they may appeal to the SAC for a second exam; decisions regarding whether a re-examination is appropriate will be made by the SAC. Students must pass both parts of the examination before advancing to doctoral candidacy and beginning full-time thesis research.

To be eligible to take the written comprehensive exam, the student needs to have attained at least a 3.0 GPA. Prior to embarking on Thesis Research, the student’s entire file (coursework, comprehensive exam, rotation evaluations, etc.) is evaluated by the SAC. If all requirements have been met and satisfactory progress has been made, the student will be approved for candidacy.

**Written Comprehensive Exam**

The exam has 14 questions (2 from each Core module) focused on the seven major areas from the Core course (NSCI501-503). The format is similar to the Core course exams but requires integrating all information covered in Core. One question of each pair must be answered. The exact scheduling of the exam varies depending on when the medical neuroscience course is taught, but it will be administered and graded before July 1 of the second year.

**Definition of passing the exam:**
Pass 7 questions (80% or higher) = pass
Pass 6 questions = pass, however the failed area requires remediation (SAC approves remediation plan, such as meeting with the module director or re-taking exam questions in this area)

Passing fewer than 6 questions results in failing the exam.

**Consequences of failing the exam:**
Student referred to the SAC, which will review total record:

Criteria for review:
- Number of questions passed on the exam
- Grades in all coursework
- Rotation reports

Potential outcomes:
- Dismissal from program
- Retake the portion of the exam initially failed
  - The areas for re-exam questions will be the same as those failed and will be clearly defined prior to the re-exam.
  - The re-exam will be taken before the end of August and will be graded prior to the start of classes for the fall semester.

If a student is allowed to retake the failed questions:

Potential outcomes:
- Pass all questions on the re-exam = pass
- Fail 1 question on the re-exam = pass with remediation (conditions determined by SAC)
- Fail 2 or more questions of the re-exam = dismissal from the program.

*Reconsideration of this dismissal by the SAC would require a written petition by the student to the SAC requesting reinstatement into the program due to severe extenuating circumstances. If reinstatement is permitted, the SAC would determine the exact requirements for this reinstatement.*
Oral Qualifying Exam

For PhD candidates, the Oral Qualifying Exam (QE) is taken during the second year. MD/PhD students are eligible for this exam as soon as they pass their written exam and have identified a thesis laboratory. The QE can be scheduled by the student at the committee’s convenience, but must be successfully completed before ascending to candidacy and full-time thesis research, no later than May 31st. Any remediation after the initial exam must be completed by June 30th.

a) Purpose:
The QE is a combination of a written research proposal, an oral defense of the proposal, and an oral exam of general neuroscience knowledge before a faculty committee. The goal of the QE is to test a student’s ability to cohesively synthesize an area of neuroscience into an NRSA-type proposal and to test the student’s ability to think independently and deeply about the major area covered in the proposal. The QE is specifically designed to ensure that: 1) students have a graduate level understanding of important basic neuroscience concepts, an in-depth knowledge of the literature within their proposed thesis area, can design experiments and interpret results, can propose research in a written grant format, can reason at a high level, and can defend their ideas orally. The QE is not an evaluation of preliminary data for the research proposal.

b) Format:
The research proposal must be provided to the Oral Qualifying Exam committee at least 2 weeks prior to the exam, and defended orally during the exam. The student should schedule the oral exam for 2-3 hours. The exam consists of questions on the Research Proposal and on related research areas. The student should not prepare an oral presentation, but should introduce the overall proposal in general terms to begin the exam discussion. Questions from the committee members will cover background knowledge to work in the field, understanding of research methods related to the student’s field of study, and basic neuroscience concepts.

1) Research Proposal (may differ from thesis proposal)
The student will develop a proposal in the form of an NIH NRSA: 1 page Specific Aims + 6 pages of Background & Significance, Innovation, Experimental Plan, Alternative Approaches and Interpretations. It must contain statements about Rigor and Reproducibility, as per NIH guidelines. Proposals will be evaluated on whether these sections are well justified, clear, and logical, with potential outcomes considered. A successful proposal could be the template for a future NRSA application.

The overall research questions and approach should be focused on an area of neuroscience selected by the student and relevant to the student’s thesis research in the approved IPN thesis mentor’s lab. The written proposal is an original work of the student with iterative consultation from the mentor or other faculty. By “original”, it is meant that the project design and analysis, background, interpretation, and writing must be the work of the student, but it can include intellectual input from faculty (although not direct editing) as it is being developed.

2) Research Training Plan
The student should also provide an outline of their training plan, based in part on the Individual Development Plan formulated in their first year. While not part of the evaluation, it will provide the student, mentor, and committee with important information for helping to create a plan for coursework, seminars, meetings, potential collaborators and other items for successful research and future career. This plan is not expected to exceed one page and can be presented in outline form. It would also form the basis of the NRSA application section on “ Applicant’s Background and Goals for Fellowship Training.” The committee can provide feedback on the Research Training Plan.

c) QE Committee Composition:
The Oral Qualifying Exam committee shall be comprised of four faculty members, at least three of which must be IPN faculty. The thesis adviser or co-adviser should be present but will not be a member of the examining committee. One member of the committee is chosen as chair to facilitate the exam. The chair must be a full member of the IPN and is charged with overseeing the examination, ensuring that all examiners have sufficient time to question the student and that all areas of the QE are addressed.

The chair is responsible for obtaining and turning in the examination form to the program administrator. This committee composition and the date of exam must be sent to the program administrator and approved by the SAC at least one month prior the QE.

d) Results of the Exam:
All committee members sign the QE Report Form. In addition, the Chair of the QE committee must give written feedback on student performance. This feedback can inform the Individual Development Plan between the student and the mentor(s). The report is sent to the Chair of the SAC and made available to the IPN director and the student.

The possible outcomes are “Pass”, “Partial Pass”, or “Fail”. A Pass should be given if a student demonstrates adequate knowledge of: 1) the broad background of the research area; 2) the specific background of the proposed research, including published findings and limitations; 3) the methods used in the research area, including their statistical analyses and limitations; 4) the key design elements of the proposed research, including rationales, limitations, and alternate approaches; and 5) the interpretations of possible results. “Partial Pass” or “Fail” indicate inadequacies or serious deficiencies in one or more of these areas. “Partial Pass” indicates that the student must re-take a defined portion of the exam as determined by the committee. “Fail” indicates that the student must re-take the entire exam for a second and final times, or, if re-examination is not recommended, the student is dismissed from the program. Any re-examination must take place prior to July 1st of the current academic year.

**Thesis Research**

**Requirements and Guidelines**

Thesis research enables the student to concentrate time, energy, and intellect on interesting problems in neuroscience. Students identify a thesis mentor at the end of the first year or early in the second year. Students having difficulty identifying a lab should contact the SAC or the program director early in their second year. If a student cannot identify a lab that is able to provide intellectual and financial support for thesis research, preparation of the oral qualifying exam cannot occur and the student could be required to leave the program.

During the third, fourth and fifth years of the program, the student devotes the bulk of her/his time to original research and to preparation of the doctoral thesis. During these years, students must attend and participate in seminars sponsored by the IPN, give a research talk annually (Neurolunch), and participate in a relevant journal club. While carrying out thesis research, the student may audit advanced courses with instructor permission for no credit in any subject of particular relevance to her/his thesis research or long-term career interests with permission of instructor (however, officially auditing a course requires registration and payment; the payment is the responsibility of the student).

a. **Identification of the Mentor and Research Area.** Some students may enter the Program with a specific mentor and/or thesis area in mind. Others will decide based on experiences during their initial years in the Program. In either case, it is expected that at the **beginning of Year 2**, the student and a mentor will have agreed on the student performing thesis research in that lab. Research toward the thesis may then be initiated, as early as the summer semester of Year 2. In the third year and thereafter, the student will be engaged in full-time laboratory research in the mentor’s laboratory. The oral qualifying exam is intended to act as a template for submission of an NIH NRSA individual predoctoral fellowship proposal (many of our students have been successful in obtaining these awards). Students and mentors should make time for regular, weekly one-on-one interactions to aid and assess research progress. **Note:** Students should be financially supported by the mentor or by individual fellowships during the years involving thesis research. Funding should be discussed prior to joining a particular lab.

b. **Labs outside of GU.** Occasionally, an IPN student conducts a portion of her/his thesis research in labs outside of GU (e.g., the NIH or Children’s Hospital). In these instances, the student must have a primary collaborating mentor at GU who will ensure that s/he is receiving proper graduate training. The primary mentor at GU must be collaborating and interacting regularly with the off-campus lab and the student. Students conducting off-campus research are still expected to spend a **substantial amount of research time on campus** and to meet the IPN requirements of a yearly Neurolunch presentation, regular thesis committee meetings, and regular attendance at a journal club. In all cases, students must get approval from the SAC before arranging rotations in or becoming part of a lab off campus.

c. **Thesis Advisory Committee.** A student’s thesis committee must include at least three Georgetown faculty members, with expertise in areas relevant to the student’s research, and an established scientist from another institution. At least two members of the Committee must be from the IPN Training Faculty. The thesis mentor is not part of the Thesis Advisory Committee, but attends the meetings. The student’s committee members must be approved by the SAC. The student should send an email to the Chair of the SAC to seek approval of the committee. After approval of the proposed members by the SAC, the members of the thesis committee designate a Chair of the committee.
Thereafter, the student meets with her/his Thesis Advisory Committee at least once per year to discuss and evaluate research progress and modify the initial research proposal if required. In general, meetings are held just after the student’s annual Neurolunch. These meetings are an opportunity to present data and get feedback from the committee with regard to the direction and progress of the project. The student is encouraged to prepare an agenda and a short handout. The student and the mentor are primarily responsible for scheduling meetings. The SAC will assist in tracking the frequency and progress of these meetings.

The thesis advisory committee has several responsibilities. It monitors progress by the student and advises on the direction and practicalities of the thesis research. It ensures that the student is developing both in terms of scientific knowledge and in terms of experimental design and execution, and that experiments are being done in a rigorous manner. It may need to help resolve disagreements between the student and mentor. Committee members should discuss career development, and, when possible, provide information about future job opportunities for the student. Finally, the committee must approve a decision for when the student is ready to defend the thesis. After the meetings, the Chair provides written feedback to the student and the program about student progress.

After each thesis committee meeting, the student is required to return a Thesis Committee Meeting Form (see Appendix) to the SAC. The form will summarize the progress and future directions of the student’s research as agreed upon by the entire committee. This form must be signed by the committee members. The Thesis Advisory Committee is responsible for notifying the student if there is insufficient research progress being made, and specific conditions that would need to be achieved for the student to achieve sufficient progress. If there are repeated notifications of insufficient progress, the SAC will review whether the student should be dropped from the program based on input from the student, the Thesis Advisory Committee, and Thesis Mentor. The recommendation will be presented to the Program Director who will then meet with the student to review.

d. Thesis Proposal. A thesis proposal should be submitted to the graduate school as soon as possible after entering thesis research. The proposal defines an original and significant research problem, assesses the research literature critically, suggests feasible experimental approaches to the problem and presents any available preliminary data in support of the approach. The thesis proposal should be presented to the Thesis Advisory Committee at its first meeting in the spring of Year 3. The proposal, with any recommended modification, should be formally accepted by the Thesis Advisory Committee around the time of the student’s Neurolunch presentation during the third year, and added to the student’s file. In addition, the student needs to complete and submit the thesis proposal form required by the Graduate School. A form for the thesis proposal can be found at grad.georgetown.edu/academics/academic-forms/. Once approved by the thesis committee, this form must be submitted to the Office of Biomedical Graduate Education.

e. Loss of Mentor. If a thesis student loses a mentor for any reason (e.g., mentor moving, irreconcilable differences, etc.), the student will work with their thesis committee or the IPN director to begin to identify a new mentor within one month. An agreement with a new mentor should be finalized within three months. In some cases, prolonged periods without a mentor could be evidence of a lack of research progress.

f. Student first author manuscript. Each PhD candidate is required to submit at least one first author, original research manuscript for publication before scheduling the thesis defense. The quality of the publication must be approved by the Thesis Advisory Committee. Many mentors have additional expectations regarding manuscripts; these mentors should discuss expectations with the student prior to joining a lab.

g. Dissertation and Defense. Each PhD candidate is required to complete an in-depth, original, independent, research project. The results of the research project are assembled into a Dissertation; the Dissertation research is presented by the student at a public seminar, followed by a closed oral examination (i.e., the dissertation defense). The Thesis Committee must formally approve the written dissertation, certifying that it represents a significant original contribution to the scientific knowledge base and that the candidate has succeeded in the oral defense. Often, committees require changes to a written thesis before it can be officially submitted to the University. If a student plans to attend the University graduation ceremony in May, the thesis must be defended and all revisions made before the beginning of April.

h. Problems with Research Progress. If at an annual thesis committee meeting the committee decides that a student is making insufficient research progress towards a degree, the student, mentor, and committee will develop a written action plan. A thesis committee meeting will be convened within six months to re-evaluate the research progress. At this second meeting, the committee may decide by consensus that: 1) student progress is sufficient for the student to continue, and the committee will schedule a meeting for six months later; 2) student progress is insufficient, and the committee may recommend to the Student Advisory Committee or Executive Committee that the student be required to leave the program.
**Deadlines for Thesis Research**

Mentor selected, research begun: By September of 2nd year

Thesis committee selected (approved by SAC) with first committee meeting after Neurolunch presentation: April/May of 3rd year

Thesis committee meeting (in conjunction with student's Neurolunch presentation): Yearly (or more often if needed)

Thesis defense: 4-6 years after starting program

Additionally, the Graduate School mandates that students complete the doctorate within 5 years of PhD candidacy (7 years from enrollment). Failure to meet this deadline requires that the student petition the Graduate School each semester thereafter to continue their studies.

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The most important forms, pertaining to thesis proposal, preparation, and defense are:

- IPN Thesis Committee Proposal Form
- IPN Thesis Proposal
- Graduate School Thesis or Dissertation Proposal Form
- IPN Thesis Committee Meeting Report
- Scheduling a Thesis Defense with (1) the Graduate School and with (2) the IPN
- Doctoral Dissertation Reviewers Report - to be submitted at least one week prior to the defense.
- Thesis Ballot
- Doctoral Dissertation Cover Sheet
- Submit Thesis
- Turn in the Electronic Thesis & Dissertation (ETD) release form
- Complete the Survey of Earned Doctorates (SED) form

Links to all forms are on the website at [http://neuroscience.georgetown.edu/forms.html](http://neuroscience.georgetown.edu/forms.html)

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**Teaching Opportunities**

Teaching is not a requirement for completion of the PhD in the IPN. However, several opportunities exist for gaining teaching experience. After completing the first year of coursework and written comprehensive exam, there are many opportunities to teach IPN first year students. For example, each summer, IPN students organize and teach a course for the incoming first year IPN students that focuses on fundamentals of cell and neuron biology, anatomy, and methods. Additionally, Recitation for the Core course (NSCI 511 & 513) was founded and is taught and maintained by senior IPN students. Finally, any IPN student who has taken the Core course and the Medical Neuroscience course is eligible to serve as a teaching assistant for the IPN Core course and for the neuroanatomy portion of the Medical Neuroscience course. Pre-thesis students can receive 1-2 credits (for Teaching Practicum) for their participation as a TA or course instructor.

IPN students have additionally coordinated “Drugs, the Brain, and Behavior,” a course for undergraduates and Masters students. IPN students who participate in teaching this team-taught course are responsible for giving 1-2 lectures on a topic related to the course. There are numerous other opportunities, including TAing for undergraduate courses in psychology, cognitive science, or neurobiology.

For students who wish to participate in a formal training program, the GU Center for New Designs in Learning and Scholarship (CNDLS) offers the Apprenticeship in Teaching (AT) program. This program allows students to participate in workshops as well as teaching-related tasks with faculty mentorship and constructive feedback. Completion of the AT program is reflected as a notation on the final transcript. See [https://cndls.georgetown.edu/atprogram/](https://cndls.georgetown.edu/atprogram/)

All teaching commitments should be discussed with and approved by the student's thesis mentor and should not detract from a student's research.
Student Research Days

Each year, the GU Medical Center Graduate Student Organization (MCGSO) sponsors a symposium among the graduate students and post-docs. Student Research Days is scheduled early in the fall semester and, as such, is an event that gives the IPN a chance to showcase our interesting, top-quality research and allows students to become acquainted with potential research projects and labs. All pre-thesis and thesis students are encouraged to submit abstracts.

Tuition/Stipend Support

In the first year, tuition and stipend for full-time students is fully paid by the T32 Training Grant awarded to the IPN*. Support includes $750 for travel to conferences or workshops, not contingent upon first author abstract submission. A Travel Authorization form, complete with approval by the Training Grant Director and mentor (if applicable), must be submitted prior to making any travel arrangements. In addition, the student must submit a cover letter with explanation of necessity of travel. Students must be pre-approved before travel by the lab, SAC, and program director, but will not be reimbursed until AFTER the costs have incurred and must submit original receipts. Travel funds do not carry over past the end of the first year (June 30); any unused funds will be forfeited.

In the second year, tuition and stipend for full-time PhD students is fully paid by BGE with approval from the BGE Dean. Support includes $750 for travel to conferences only and is contingent upon 1st author presentation (poster/oral presentation) by the student. A Travel Authorization form, complete with approval by the mentor and IPN Director, must be submitted prior to making any travel arrangements. Students must be preapproved before travel, but will not be reimbursed until AFTER the costs have incurred and original receipts have been submitted. Travel funds do not carry over past the end of year 2 (June 30); any unused funds will be forfeited. MD/PhD students are supported in their second graduate year through their thesis research laboratories.

During thesis research, tuition, stipend, and travel support are provided by the thesis laboratory. This requires that the student identify a laboratory that can provide funding for them, and to work with the thesis advisor to designate supporting funds at the beginning of each fiscal year (requests for this information are sent out in May/June of each year). Students have been supported by a variety of mechanisms, including federal and private funds awarded directly to the students or by training grants, by federal and private funds awarded to individual labs, and by fellowships for teaching or research awarded by the Georgetown University Graduate School. Please refer to the IPN website for resources about funding mechanisms.

In special circumstances, application for additional funds from the graduate school will be considered. Georgetown University offers eligible graduate students funding under several student loan and employment aid programs such as the Federal Stafford Loan, Federal Perkins Loan, and the Federal Work-Study program. Eligibility for the federal loan and work programs is based upon financial need; however, most private loans and the Employment Referral Service are not based on financial need. Due to limited funding, Federal Perkins and Federal Work-Study funding is offered to applicants who demonstrate exceptional financial need, and awards are generally made on a first-come, first-served basis.

PhD students are prohibited from receiving any additional compensation from Georgetown University for work beyond their regular stipend amount. This prohibition is due to restrictions on stipends from the NIH and the NSF, and to the definition of “full-time research” by the University for PhD student support.

Student Research Grants and Fellowships

The GU MCGSO also offers renewable research grants of up to $5,000. Students who have passed all comprehensive exams are eligible to apply. These funds go toward conducting independent research projects that are part of thesis research but not directly funded by the thesis mentor. These grants are competitive and offered on a yearly basis. Applications are typically due in the early spring semester and are scored in a peer-review study section that determines fundable applications and budgets. The Student Research Grant Program has led to many successful projects that have facilitated productive collaborations, publications, and findings that would have otherwise been hindered due to lack of funds. Additionally, students are encouraged to actively apply for other mechanisms of research funding with the guidance of their thesis mentor.
Travel Grants

MCGSO awards funding to qualified students who present a poster or oral presentation at a scientific conference. Awards help defray out-of-pocket costs related to the conference: room, board and related travel expenses (airfare, airport shuttle, airport parking, cab fare, etc.). Funds are limited; therefore, grants may be competitive, but are currently offered on a rolling, first-come, first-served basis. Students must be pre-approved before travel, but will not be reimbursed until AFTER the costs have incurred and original receipts have been submitted. Applications are available through any MCGSO travel grant officer (see MCGSO website for details: http://gumcgso.georgetown.edu/grants/travel-grants/).

Additionally, the Graduate School offers travel awards for either conference travel OR for dissertation research conducted outside of the United States. These applications are competitive and have discrete deadlines (currently one per semester). Please refer to the Graduate School website for more information: https://biomedicalprograms.georgetown.edu/financial/travel.

Leave of Absence

If a student needs to take a leave of absence, s/he must adhere to the policy outlined in the Graduate Student Bulletin and on the Graduate School website. Information listed here is accurate at the time of posting, but may not reflect any new changes to the Graduate School Policy.

Briefly, there are several types of leave: Personal, Medical, Military, and Parental Leaves. The student must complete the “Student Petition for Change to Program” form available through the Graduate School website and have this signed by the department or program head. For Personal Leave, no more than four semesters can be granted during graduate study, and only two semesters at a time may be granted. **Personal Leave does not extend promised funding.** During Personal Leave, students may not attend classes, work on or defend their thesis, or complete any other degree requirements. During thesis research, Personal Leave should only be requested in the case of unforeseen emergencies that would prevent the student from making significant progress on the dissertation.

The four semester (two semesters at a time) policy does not apply to Medical or Military Leave. **Medical Leave** is granted specifically for a student, not a family member, who will be receiving medical treatment and returning to the University. Students needing Medical Leave should contact their academic Dean’s office and the Student Health Center or Counseling at Psychiatric Services (CAPS). Guidelines for Medical Leave can be found on the website of the Office of the Vice President for Student Affairs. **Military Leave** applies to students who are called to active duty. Students must notify their Dean’s office and are eligible for tuition refund and courses marked “W” on the transcript.

**Parental Leave**, unlike other types, is intended to enable the graduate student to continue to make progress toward his or her degree. It does not grant additional semesters of promised funding, however under certain circumstances, funding may be deferred. It does not change the length of time permitted for completion of degree requirements and graduation. Up to six weeks of Parental Leave may be granted for the primary and full-time caregiver of a child who is newly born, or a child less than five years of age who has been newly placed in the home via foster care or adoption. A written request for leave must be submitted to the Graduate School Associate Dean for Academic Affairs no less than three months before the expected date of leave. During Parental Leave, a student may attend classes or work on assignments, as long as instructors are notified. A student may request voluntary Medical Leave in addition to Parental Leave; however this may affect student health insurance.

Please discuss any leave of absence with the IPN Director.
Practical Information

General Graduate Student information

There is a website entitled “STUDENT RESOURCES AT GEORGETOWN: Directory of Resources for Graduate Students at Georgetown University.” Please check there (http://grad.georgetown.edu/about/student-life/grad-services-directory) for academic resources, career services, diversity & heritage resources, financial resources, health resources, housing resources, international student resources, assistance/issues resolution resources, libraries/research services, policies and regulations, recreation resources, safety resources, services on campus, student governance, student life, transportation resources, and information about living in the Washington DC area.

GU Student Insurance

Since health care costs are continuing to increase rapidly, a student who is not covered by adequate health insurance faces enormous financial burdens if s/he suffers a serious accident or illness. Each student is strongly advised to investigate his or her insurance status before registration. For those students who do not have adequate insurance coverage, Georgetown University offers an excellent medical insurance policy tailored to their medical and financial needs. The premium for this insurance plan is automatically added to the tuition bill of every student who takes nine or more credit hours so that students may pay for it with loans or scholarships. The coverage may be waived upon written proof of adequate medical insurance from another source.

Student Health Center

Primary medical care is available at the Student Health Center, an outpatient clinic located on the ground floor of Darnall Hall, near the GoCard office and Epicurean Restaurant. The Student Health Center offers a variety of medical services administered by physicians, nurse practitioners, nurses, athletic trainers, etc. Appointments are encouraged and can be made in person or by calling (202) 687-2200 (Option 1). During the academic year, the clinic is open from 8:30 a.m. to 4:30 p.m. on Mondays, Tuesdays, Thursdays, and Fridays; from 9:30am to 4:30pm on Wednesdays. The center is closed on Saturdays and Sundays. After hours, students may call the on-call student health clinician at (202)444-7243 or obtain emergency care in the Emergency Room of the Medical Center. In the case of an emergency, please contact 911 emergency services. Detailed information regarding the Student Health Center can be found online at http://studenthealth.georgetown.edu/medical-care/.

Counseling Services

Located on the first floor of Darnall Hall, the Counseling Center houses Counseling and Psychiatric Services (CAPS), Learning Services, and Disability Support Services. The collective mission of the Counseling Center is to attend to the health and safety of Georgetown students in the areas of mental, emotional, and special learning problems and to provide needed support for disabled students. The goal is to promote the overall educational mission of the university by maximizing students’ readiness to learn and ensuring safe access to university facilities. Business hours for counseling services are Monday through Friday 9:00am to 5:00pm, closed Saturdays and Sundays. Appointments can be made in person during business hours or by calling (202)687-6985. For emergency consults after hours, please call (202) 444-7243 and ask for the on-call CAPS clinician.

Housing

Listings and other information about off-campus housing for graduate students can be found online at https://ochlistings.georgetown.edu/. Through a partnership with Virginian Suites, the Graduate School now provides limited designated graduate student housing. See: https://ochlistings.georgetown.edu/property/view/listingid/211765 for more information. Other sources of off-campus housing information are newspaper classifieds (e.g., Washington Post, Washington Times, or the City Paper) and websites (e.g., Craigslist).

IPN Committees

Committees in the IPN are made up of both student and faculty members and include the following:

Executive Committee - Sets policy for the IPN
Admissions Committee - Regulates admissions to the IPN
Curriculum Committee - Sets and approves courses for the IPN
Student Advisory Committee - Deals with student issues for the current students in the IPN
IPN Student Government - Sets policy for IPN students, organizes annual retreat, other activities
Student Action Committee - Ad hoc formed to accomplish goals as determined by IPN Student Government
Other - MCGSO and GSO, advocate for graduate student needs. Consist of student program representatives and independent executive committees.
Links to these committees are at: http://neuroscience.georgetown.edu/ipn
Libraries

The libraries of Georgetown University are essential resources for graduate education and research. Together with the large number and wide variety of library collections in the Washington area, they provide a remarkably rich research environment. For resources not available at Georgetown but that may be available at other universities, Georgetown participates in InterLibrary and Consortium Loans to aid students in their research endeavors. For more information, please refer to the website at www.library.georgetown.edu/loans.

Libraries at Georgetown include:

**Joseph Mark Lauinger Memorial Library**

The principal library on the Main Campus, housing more than 2 million volumes in the social sciences, humanities, and business. Lauinger provides seating facilities for 1,100 users and offers study rooms and closed carrels to faculty members and graduate students. There are comfortable student discussion rooms and lounges, including a separate graduate student study lounge.

**Dahlgren Medical Library**

Housed on the Medical Campus, DML contains resources to support research and education in Medicine and the Biomedical Sciences. It currently houses 172,000 volumes, maintains more than 1800 journal subscriptions, and accommodates 36,000 audiovisual and computer programs.

**Blommer Science Library**

(Reiss Science Building, Room 302)—Provides information resources and services in the biological and physical sciences, mathematics, and computer science. The science collection includes 130,000 books and bound periodicals and more than 700 current journal subscriptions.

**National Reference Center for Bioethics Literature**

(Healy Hall, Room 102) — A specialized collection of materials concerned with contemporary bioethics issues such as abortion, death and dying, and organ transplantation.

Recreation

The Yates Field House is a multifaceted student recreation center that houses intramural, instructional, and recreational programs. The building contains a 25-yard swimming pool, and courts for tennis, racquetball, squash, basketball, and volleyball. There are treadmills, stair-climbers, cross-trainers, and a weight-training area. Aerobics and yoga classes are offered in two studios. There are saunas for men and women and a complete Pro Shop. Students are provided membership to Yates through the 5th year in the program. Yates also offers family memberships to students.

A number of IPN students, fellows and faculty members play on a city-wide softball team, the Myoclonic Jerks. All players and fans are welcome. Students have also regularly formed various intramural sports teams, including basketball, soccer, etc.

Career Resources

Georgetown offers many career services accessible to all IPN students. Specifically, the Office of Biomedical Graduate Education has a dedicated Director of Recruitment and Career Services who offers career counseling appointments, workshops, and social media portals for job searches and advice. See these additional resources for career services:

IPN Website: http://neuroscience.georgetown.edu/careers.html
BGE Website: http://biomedicalprograms.georgetown.edu/career-services
Georgetown Cawley Career Education Center: http://careercenter.georgetown.edu/
Georgetown Alumni Career Services: http://alumni.georgetown.edu/career/career_1.html

Student Grievances

If a student needs a problem or complaint heard, especially if this is beyond the scope of the lab or concerns the thesis mentor, s/he should seek out the SAC for guidance. Similarly, if a student wishes to appeal a decision made by the IPN, s/he should bring the appeal to the SAC. If the SAC response does not resolve the concerns of the student, s/he should seek help through the Graduate School Ombuds Office (http://grad.georgetown.edu/academics/grad-ombuds).

Supplementary Information & Website
Please visit http://neuroscience.georgetown.edu/ for current information regarding IPN students, faculty, committee membership, research areas, course descriptions, events, relevant forms, etc.