

Section 11. Description of Institutional Environment and Commitment to Training

Mount Sinai's Graduate School of Biomedical Sciences was established in 1968 and bestows a Ph.D in Neuroscience or in Biological Sciences (all other training areas). The graduate program is approved by the Middle States Commission on Higher Education.

The Neuroscience Graduate Training Program has a curriculum that is distinct from all other Ph.D training areas at Mount Sinai, and is multi-disciplinary, spanning many basic and clinical departments, Centers and Institutes, including the Department of Neuroscience and the Friedman Brain Institute. Sinai has targeted Neuroscience for robust growth in numbers of training Faculty over the past 6 years, with well over 100 faculty that participate in the Training Program. Faculty are organized into research "Areas of Excellence" that include Addiction, Cognition, Neural Development and Autism, Depression and Anxiety, Epigenetics, Molecular Psychiatry, Glia and Myelination, Stem Cells, Parkinson's, Alzheimer's and other Neurodegenerative Disorders, Schizophrenia and others. Reflective of our outstanding faculty's research excellence, **Sinai's Department of Neuroscience currently ranks 4th nationally in NIH funding** (Blue Ridge Institute for Medical Research). The school has allocated nearly 5,000 sq feet of space to the educational and research activities of the Neuroscience Department and Friedman Brain Institute that serve the Training Program. There is, additionally, ~100,000 sq feet of research laboratories that house the Department's and the Institute's research programs and 4,500 square feet dedicated to Institutional CORE facilities. The latter provides substantial support for innovative, state-of-the-art technologies essential to our research programs. The compact size of Mount Sinai makes it possible for all investigators, students and postdocs to have essentially unlimited and easy access to these resources. Collaborative interactions among the Neuroscience Graduate Training Faculty are the rule rather than the exception, and co-sponsorship of students and postdoctoral fellows is common. Generally, the Program leverages close partnerships between the School of Medicine and The Mount Sinai Hospital to foster groundbreaking research and student mentoring in basic, clinical and translational neuroscience. Exploiting diverse model systems ranging from flies to human brains, the Neuroscience Training Program promotes investigative research of the nervous system at the molecular, cellular, systems, and behavioral levels. The Program Director is **George W. Huntley, Ph.D** Professor of Neuroscience and member of the Friedman Brain Institute.

The Program matriculates ~11-15 students per year. The average time to obtain a Ph.D in Neuroscience at Mount Sinai is 5.1 yrs. To ensure a smooth and successful transition to Graduate School, to help navigate policies, courses and requirements, and to help students formulate their academic and career-goal milestones, all incoming students are assigned an Advisory committee (three faculty, one of whom is a Program Co-Director) and a "big brother/sister" (a more senior, current student). The Advisory committee helps each student choose their rotations (minimally two are required) and to select a thesis lab. During the first year, all Neuroscience students are required to take a 4-part Core sequence comprising Cellular and Molecular Neuroscience, Systems Neuroscience, Behavioral/Cognitive Neuroscience and Pathophysiology of Human Brain Disorders. Additionally, a 5th required course, called "*Topics in Clinical Neuroscience*", provides direct-patient contact that is integrated with the didactic curriculum of the Pathophysiology course. Students are also required to take *Biostatistics*, *Responsible Conduct in Research*, and "*Rigor and Reproducibility*" a course that addresses best practices in managing laboratory data, communication and data-archiving. These courses are typically finished by mid-April in the first year. Additional course requirements include completion of two Advanced Electives, chosen from across the Institution, and customized to fit particular training needs. Typical electives include *Advanced Neuroanatomy*, *Synapse Development and Plasticity*, *Drug Development and Design*, *Neuropharmacology of Drug Addiction*, *Stem Cell Biology*, *Neurodegeneration and Aging*, *Advanced Genetics and Genomics*, *Immunology*, *Cancer Biology*, et al.

In addition to completing required courses by mid-April, most students by this time have also completed their rotations and have chosen a thesis lab. Once a thesis lab is chosen, the first-year Advisory Committee dissolves, and a Thesis Advisory Committee is formed. This committee comprises 4 faculty chosen by the student and their mentor for specific expertise to help shape and guide the student's thesis project. Their input, along with the mentor's, takes the form of an Individualized Development Plan (IDP), where milestones and timelines are clearly specified. By the end of the second year, students present their thesis proposal, as both a written document (NRSA format) and an orally-defended exam, to their Thesis Advisory Committee. Additionally, the oral defense of the thesis proposal includes a General Knowledge component focused on the subject area of the student's proposed thesis work. There is no other, separate General Knowledge Exam. Students are evaluated for their ability to: 1) write a coherent proposal synthesizing relevant background

material; 2) defend the project hypotheses and methods, with particular attention to a detailed understanding of the limits, advantages and alternatives to their technical approaches; 3) configure a compelling and feasible experimental plan; 4) relate project results to the broader field; and 5) deliver a comprehensive formal presentation. Mechanisms are in place to monitor progress and help students correct deficiencies. Specific metrics include maintaining at least a B average in required course work, successful evaluations of research rotations and successful defense of the thesis proposal. Students not meeting these standards are evaluated by the Graduate School Committee of Academic Review to determine appropriate corrective actions. Additionally, students are required to meet twice/year with their Thesis Advisory Committee, where they formally present their progress. The Committee evaluates progress against student milestones laid out in their IDP.

There are several venues for students to gain skills in data presentation and to remain engaged in current research broadly across all Neuroscience disciplines. All students, throughout all years, are required to attend the annual *Friedman Brain Institute Retreat*, a weekly student Works-in-Progress, and a weekly interdepartmental *Translational Neuroscience Seminar Series*, where students have the opportunity to interact with internationally recognized experts, many speaking on a diverse array of current topics in neuroscience. Each of these outlets provides a rich forum for spirited interactions among students and neuroscience researchers representing both clinical and basic science endeavors. Additionally, many students participate in one or more "Clubs", which are groups of 8-12 participating labs with a common interest (e.g. *Cells and Circuits Club*, *Depression Club* et al). All students, postdocs and faculty of participating Clubs are expected to speak on a rotating basis. Finally, the Seaver Autism Center, headed by Dr. Joseph Buxbaum, offers a variety of ongoing seminars and workshops on clinical and basic science aspects of autism. **[Your name]** has, and will continue, to avail **him/herself** of these forums.

The Graduate School provides a rich support system for career development. The Office of Career Services and Strategy, headed by Dr. Ellie Schmeizer, provides customized strategies for aligning career goals with job opportunities, and supports numerous workshops on a variety of topics such as CV-to-resume conversion, successful interview strategies and others. Together, this vast network of career development opportunities will ensure that **[your name]** will be able to expertly navigate the employment market as a Neuroscience PhD. At a Departmental level, the Training Program sponsors a Career Lunch Series, where Neuroscience Ph.Ds who have pursued professional opportunities in industry, academia, finance, journalism, intellectual property, and/or law, are invited to share their career paths and experiences with our current students and postdocs. Other professional development workshops supported by the Graduate School include an annual Grant Writing Workshop, individually tailored for interested students and fellows.

To foster mentoring and teaching skills, students can serve as Teaching Assistants for our Core courses, or participate in MiNDS (Mentoring in Neuroscience Discovery at Sinai), which is a Neuroscience Outreach Program organized by Mount Sinai Neuroscience graduate students. MiNDS hosts an annual Brain Awareness Fair to promote public awareness of brain research, where a number of fun, brain-centric exhibits and games are created for local NYC elementary, middle, and high school students and their parents. MiNDS predoctoral trainees also travel to local public schools principally in our East Harlem neighborhood, where they teach and demonstrate basic neuroanatomy to high school and junior high school students. Lastly, Sinai's CEYE program (Center for Excellence in Youth Education) partners with some of New York's prestigious science and engineering public high schools to provide a pipeline of science-bound high-school students who spend 2 yrs conducting mentored research in the lab.

[Your name] is currently a **XX-year** student. **He/she** has completed all *Neuroscience Core* courses, *Biostatistics*, *Responsible Conduct in Research* and (any Advanced Electives list here). This Fall/Spring, **201X**, **your name** will take **XXX**, thereby completing all required coursework. **He/she** has completed rotations, and **he/she** and I together have assembled her Thesis Advisory Committee. **He/she** plans to defend his/her thesis proposal in **Month, year**. Additional details of **[your name]** Individualized Development Plan can be found in *Section 9, Sponsor Statement (Training Plan, Environment and Research Facilities)*.

Prepared by Dr. George W. Huntley, Director, Neuroscience Training Program