MD Anderson Cancer Center UTHealth Graduate School of Biomedical Sciences (GSBS) is a joint venture of The University of Texas Health Science Center at Houston (UTHealth) and The University of Texas MD Anderson Cancer Center that offers Ph.D. and M.S. degrees in Neuroscience. Training in Neuroscience at the GSBS began in 1978 to provide high quality opportunities in a variety of scientific disciplines associated with understanding the function and diseases of the nervous system. Areas of research concentration within the Program include cellular, molecular, systems, computational, and visual neuroscience. There are 70+ GSBS faculty members and 30+ graduate students representing sixteen departments of UTHealth and MD Anderson currently in the Neuroscience Graduate Program.

All Ph.D. students receive full financial support throughout their training, which includes tuition, fees, stipend, and benefits. Annual competitive awards are also available for outstanding research projects and posters, and to support student travel to scientific meetings. For more information please visit neurograd.org.

**Program Overview**

Transsynaptic labelling of dorsal raphe neurons (green) from cfr2+ serotonin neurons (red). Annual Retreat

**Doctoral Requirements**

Students must complete the following requirements to obtain the degree of Doctor of Philosophy with a specialization in Neuroscience:

**Research Rotations:**
First-year students obtain hands-on research experience by participating in three research tutorials.

**Coursework:** All students in Neuroscience are required to take the four Program Core Courses (Molecular Neurobiology, Cellular Neurophysiology, Cognitive Neuroscience and Systems Neuroscience). Also required are the Ethical Dimensions of Biomedical Science, Scientific Writing, and Biostatistics for Life Scientists. Core Courses must be taken for credit and a grade of “B” or better must be earned.
Our students have the opportunity to receive training and to conduct research in all areas of modern neuroscience.

**Cellular & Molecular Neuroscience**
Research in Cellular and Molecular Neuroscience enables students to understand neuronal function by integrating biochemical, physiological, cellular, and molecular biological approaches. Areas of focus include: synapse formation and plasticity, local circuit dynamics, protein trafficking, signal transduction, neuropsychiatric, and neurodegenerative disorders, and neuronal development/injury.

**Cognitive & Systems Neuroscience**
Research in Cognitive and Systems Neuroscience allows students to become familiar with a diverse set of approaches and techniques required to investigate the brain mechanisms underlying complex behavioral phenomena such as learning and memory, attention, language, cognition, emotion, sensation perception, and movement.

**Theoretical & Computational Neuroscience**
Research in Theoretical and Computational Neuroscience focuses on the broad range of computational and analytical skills essential to understand the organization and function of complex neural systems.

**Visual Neuroscience**
Research in Visual Neuroscience covers the various experimental and theoretical approaches to understand the biological mechanisms of vision. Areas of focus include molecular and developmental neurobiology, cell biology, cellular biophysics, structural biology, genetics, anatomy and plasticity of neural circuitry, circadian biology, experimental pathology, cognitive and behavioral studies, and computational modeling.

To advance to candidacy, all students need to defend an NRSA-style proposal as part of a candidacy exam. This exam will take place by the end of the 2nd year.

**Defense of Dissertation:**
Students defend their dissertation research in a public presentation (followed by public discussion) and an oral defense (in a closed session with the student’s Advisory Committee).

All students must have at least one first-author paper accepted in a peer-reviewed journal.

Diasynou Fioravante, Ph.D.
2006 NGP graduate (Byrne Lab) and Assistant Professor at UC Davis

“Through solid class offerings, opportunities for research distinctions and travel awards, the Neuroscience program at UT-Houston provided me with a strong foundation for a successful academic career.”
Jaroslaw Aronowski, Ph.D. • Neurology • Neuropharmacology/models of ischemic stroke and intracerebral hemorrhage

Tatiana Barichello, Ph.D. • Psychiatry & Behavioral Sciences • Neuroinfection, host immune response, memory impairment, behavioral changes

Andrew Bean, Ph.D. • Neurobiology & Anatomy • Molecular mechanisms of endocytosis

Michael Beierlein, Ph.D. • Neurobiology & Anatomy • Synaptic and local circuit dynamics in the thalamocortical system

Darren Boehning, Ph.D. • Biochemistry and Molecular Biology • Alteration of apoptotic cell death in cancer and neurodegeneration

Mark Burish, Ph.D. • Neurosurgery • Circadian & neurophysiologic aspects of headaches using patient tissue

John Byrne, Ph.D. • Neurobiology & Anatomy • Neural and molecular bases of learning and memory

Qi Lin Cao, M.D. • Neurosurgery • Transplantation of neural stem cells (NSCs)

Robert Dantzer, Ph.D. • Symptom Biology • Behavioral and psychopathological consequences of the effects of cancer therapy on the brain

Pramod Dash, Ph.D. • Neurobiology & Anatomy • Mechanisms of memory formation and memory dysfunction

Joao De Quevedo, MD, Ph.D. • Psychiatry & Behavioral Sciences • Neurobiological basis of psychiatric disorders, emphasis in mood disorders and schizophrenia

Fabricio Do Monte, D.V.M., Ph.D. • Neurobiology & Anatomy • Neural mechanisms of innate fear and reward and their interactions

Patrick Dougherty, Ph.D. • Anesthesiology & Pain Management • Neurobiology, neurophysiology, and pharmacology of the spinal dorsal horn

Valentin Dragoi, Ph.D. • Neurobiology & Anatomy • Cortical mechanisms of visual behavior

Daniel Felleman, Ph.D. Neurobiology & Anatomy • Organization, function, and plasticity of primate cerebral cortex

Michael Galko, Ph.D. • Biochemistry & Molecular Biology • Drosophila genetics, molecular genetics of tissue repair, cell migration, signaling and signal transduction, pain sensitization

David Grosshans, M.D., Ph.D. • Radiation Oncology • Cellular mechanisms of radiation induced cognitive decline

Ruth Heidelberger, M.D., Ph.D. • Neurobiology & Anatomy • Mechanisms of neurotransmitter release

Cobi Heijnen, Ph.D. • Symptom Research • Pathophysiology of cancer therapy-induced physiological/behavioral toxicity

Scott Lane, Ph.D. • Psychiatry & Behavioral Sciences • Substance Use Disorders, Antisocial Personality Disorder

Fudong Liu, M.D. • Neurology • Innate immune responses to cerebral ischemia

Yin Liu, Ph.D. • Neurobiology & Anatomy • Computational biology and bioinformatics

Ying Liu, M.D., Ph.D. • Neurosurgery & Center for Stem Cell and Regenerative Medicine/IMM • Genetic engineering of pluripotent stem cells, neural differentiation, disease modeling of CNS

Sadhan Majumder, Ph.D. • Genetics • Examine the differentiation of neural stem/progenitor cells into neuronal pathway

Chai An Mao Ph.D. • Ophthalmology and Visual Science • Combining mouse genetics, anatomical studies, and behavioral and physiological analyses to study these topics

Monica Gireud, Ph.D. 2017 NGP graduate (Bean Lab)

“There’s so much that is unknown. There are very few cures and often little understanding of why diseases affect the brain. It’s fascinating. It’s exciting.”

Russell Milton, Ph.D. student

“The Neuroscience Program provides a uniquely collaborative environment that leads itself to impactful and multifaceted research direction.”
Image above: Localization of SAP102 and Syntaxin 3B (Syn3B) in the outer plexiform layer (OPL). A single B-type horizontal cell (HC) was dye injected with Neurobiotin (red). A horizontal section showing SAP102 immunoreactivity (blue) was localized to tips of B-type HCs. Syn3B-positive (green) photoreceptor terminals exist in precise register with SAP102 immunoreactive B-type HC processes.

M.D./Ph.D. students affiliated with GSBS Neuroscience

M.D./Ph.D. students are required to take three of the four Neuroscience Program core courses. In consultation with their Advisory Committee, they can replace one of the three courses with a graduate course deemed more suitable to their research focus.

Cihan Kadipasaoglu, M.D./Ph.D.
2015 NGP graduate (Tandon Lab)
Postdoctoral Fellow UTHealth

"Although I began as an outsider to both the M.D./Ph.D. and Ph.D. programs, I never once felt as such. Rather, it seemed to me that the students from both programs had formed a united ‘research family,’ into which I was immediately and unquestioningly welcomed."
Neurobiology Seminar Series. Neurobiologists from around the country are invited to present their latest findings. In addition to the afternoon lecture, our students have the opportunity to network with each speaker over lunch.

Annual Retreats. Students take a short break from lab to attend special lectures given by program alumni, student presentations, and poster competitions.

Picnic/Socials. Faculty and students have the chance to get together to enjoy good food and good weather.

Annual Research Poster Sessions. Students have the chance to win cash prizes and travel awards to fund trips to the annual Society for Neuroscience (SfN) meeting and other conferences.

Student-Organized Journal Club. Students present and lead discussions about an interesting paper, topic, or technique. At the end of the year, the two best presenters are awarded prizes.

Outreach/Volunteer Opportunities. Students have the chance to give back to the Houston community. In the past, our students have sorted food for the Houston Food Bank, judged science and engineering fairs, and explained neuroscience concepts to local elementary students at the Neuroscience Research Center’s annual Brain Night at The Health Museum.

Teaching Assistant Opportunities. Students who want to get hands-on experience in the classroom may sign up to teach various undergraduate or graduate courses throughout the year.

Neuroscience All-Request Fridays (NARFs). Students, faculty, and other invited guests host workshops geared towards career development, presentation skills, networking, and other technical skills not covered in classes. Requested by students, for students.

Leandra Mangieri, Ph.D. student
“The GSBS Neuroscience Program has been so supportive during the years of hard work, providing excellent guidance and an amicable atmosphere for making graduate training as rewarding as possible. The challenges we faced have made us highly competitive in this burgeoning field of science.”
about the graduate school

The Graduate School is a unique partnership between the MD Anderson Cancer Center and UTHealth, institutions that are leading the fight against cancer and other major diseases that impact human health and quality of life. Graduate studies under a GSBS faculty mentor will provide students with training in the most significant areas of the biomedical sciences, including research to improve understanding of disease mechanisms at molecular, genetic, cellular and systems levels, and approaches to develop novel targeted therapies for human disease. The school is located in the Texas Medical Center. It’s the world’s largest biomedical education and research facilities. Visit gsbs.uth.edu for more information.

how to apply

For all U.S. Citizens, Permanent Residents and International Applicants:

The final deadline for all application materials to be submitted for the Ph.D. program is January 4. Early applications are encouraged.

The deadline to apply for the M.S. program in Biomedical Sciences is April 1.

Curtis Neveu, Ph.D.
2017 NGP graduate
(Byrne Lab) Postdoctoral Fellow Northwestern University
“I like that many faculty and students are eager to help each other succeed.”

Samantha Debes, Ph.D. student
“The GSBS Neuroscience Program offers a unique environment, rich in diverse funding opportunities, renowned guest speakers innovative collaborations and cutting edge research.”

Cameron Jeter, Ph.D.
2011 NGP graduate
(Sereno Lab) and Assistant Professor at UTHealth
“The Neuroscience program equipped me with skills I didn’t fully appreciate until becoming a faculty member. Program faculty continue to foster my scientific and professional growth as mentors, collaborators, and advocates.”

Ryan Cassidy, center, with Deans Michael Blackburn, Ph.D., left, and Michelle Barton, Ph.D. Cassidy received the 1st place and People’s Choice the in the GSBS Student Research Day Elevator Speech Competition (Post-Candidacy).
Houston, the fourth largest city in the nation, is located on a coastal plain 50 miles from the Gulf of Mexico and has a southern climate. Houston is a modern, dynamic city, rich in cultural diversity that reflects its multiethnic mix.

Houston has emerged as a cultural center for the Southwestern United States. The seventeen-block Theater District is home to eight performing arts organizations, including the Houston Ballet Company, the Houston Symphony, the Houston Grand Opera, and the Alley Theater. The Museum of Fine Arts, the Contemporary Arts Museum, and the Houston Museum of Natural Science all offer outstanding exhibitions. Numerous smaller museums and art galleries can also be found in the Museum District, just one mile north of the Texas Medical Center. These notably include the Menil Collection and Rothko Chapel.

Sports enthusiasts can take advantage of professional sports action year-round. Houston is home to a number of professional sports teams: the Texans play at NRG stadium (NFL football), the Dynamo and Dash play at BBVA Compass Stadium (MLS and NWSL soccer), the Rockets play at Toyota Center (NBA basketball), and the Astros play at Minute Maid Park (MLB baseball). In addition, Houston’s close proximity to the Gulf of Mexico, Galveston Bay (50 miles) and local lakes provides access to a full range of water sports.

Among major metropolitan areas of the country, Houston has one of the lowest costs of living. In addition, the diversity and breadth of the city’s economy provides a wide array of job opportunities for spouses and family members. Low housing costs and friendly people combine to make this a desirable city in which to relocate.

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