NEUROSCIENCE, PH.D.

Administrative Unit: Neuroscience Training Program
College/School: School of Medicine and Public Health
Admitting Plans: Ph.D.
Degrees Offered: M.S., Ph.D.
Minors and Certificates: Doctoral Minor

The neuroscience training program (NTP) was established in 1971. Currently, it comprises over 100 faculty members whose research interests range from molecular neurobiology to integrative systems. The program is designed to prepare students for careers in research and teaching. On average the number of students in the program is approximately 50, half of whom are women. The program is best suited for students who are independent and wish to take a direct role in determining their graduate education. Training leads to the Ph.D. degree in neuroscience or the M.D./Ph.D. degree in cooperation with the School of Medicine and Public Health.

The doctoral program of each graduate student in the training program is tailored to meet individual needs. Each student's program is supervised by an advisory committee of five faculty members selected by the student in consultation with the major professor. During the first year students complete three laboratory rotations and take one-semester courses in molecular/cellular neuroscience and systems neuroscience. Students also take one upper-level course in molecular/cellular and systems neuroscience. Additional advanced courses may be taken to complement individual research interests.

A preliminary examination is required of all Ph.D. degree candidates at the end of the second year of graduate study. The examination consists of two written papers that are presented orally to the student's advisory committee. The first paper is a critical evaluation of a research topic outside the student's major area of interest. The second paper is a thesis research proposal. Additional requirements for the Ph.D. degree are attendance at the weekly neuroscience seminar and completion of one semester of teaching.

The central forum for intellectual exchange in the program is the neuroscience seminar (NTP 900 Neuroscience Seminar: Current Topics in Neurobiology), which meets weekly and is attended by neuroscience students and faculty. During an academic year, members of the program choose six topics in current neuroscience research for consideration. Topics are reviewed intensively in study groups supervised by faculty sponsors. Critical summaries of each topic are then presented by students to participants in the seminar as a series of lectures and discussions. Each three- to four-week topic session concludes with a lecture by an outside invited speaker who is well known for his or her research in the topic area. In the course of every three- to four-year period, most of the major research areas in neuroscience are reviewed in the neuroscience seminar; consequently, students become familiar with the breadth of contemporary neuroscience.

The average time taken by students to complete the Ph.D. degree is five years. The program prepares students for careers primarily in research and teaching in universities and colleges and careers outside of academia. Of the more than 200 students who have earned the Ph.D. degree in the program, more than 95 percent have careers in biomedical science.

NEUROSCIENCE & PUBLIC POLICY PROGRAM

The neuroscience & public policy program (N&PP) offers three integrated degree tracks with the cooperation of the neuroscience training program, the La Follette School of Public Affairs and the University of Wisconsin-Madison Law School. The N&PP is based on two strongly held beliefs: first, that sound science and technology policy and law are essential for the well-being of societies; second, that a step toward ensuring such policy is to train future scientists in the making of public policy or the law and prepare them to participate in bringing science and society closer together.

The program offers students the opportunity to earn a Ph.D. degree in neuroscience as well as a master of public affairs (MPA), a master of international public affairs (MIPA), or juris doctorate (J.D.). In each of the degree tracks, the program brings together faculty from neuroscience, public policy, bioethics, sociology, and law and other related fields to train research neuroscientists who will be qualified to help shape public policy or the law. The cross-disciplinary training combines didactic and laboratory research training in neuroscience with a classroom-based and hands-on education in public policy or the law.

For more information about the double and dual degree tracks offered through the neuroscience & public policy program including admissions and program requirements please visit the program website (http://ntp.neuroscience.wisc.edu/npp.htm).

FUNDING

Each student receives a stipend that covers tuition, fees, living costs, and health insurance and is guaranteed for five years if progress is satisfactory. Financial support is provided from the program's NIH training grant, fellowships, and faculty research grants. Limited support is available for international students.

REQUIREMENTS

MINIMUM DEGREE REQUIREMENTS AND SATISFACTORY PROGRESS

To make progress toward a graduate degree, students must meet the Graduate School Minimum Degree Requirements and Satisfactory Progress (http://guide.wisc.edu/graduate/#policiesandrequirementstext) in addition to the requirements of the program.

DOCTORAL DEGREES

Ph.D.

MINIMUM GRADUATE DEGREE CREDIT REQUIREMENT

51 credits

MINIMUM GRADUATE RESIDENCE CREDIT REQUIREMENT

32 credits
MINIMUM GRADUATE COURSEWORK (50%) REQUIREMENT

Half of degree coursework (26 credits out of 51 total credits) must be in graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university’s Course Guide (http://my.wisc.edu/CourseGuideRedirect/BrowseByTitle).

PRIOR COURSEWORK REQUIREMENTS: GRADUATE WORK FROM OTHER INSTITUTIONS

With program approval credits from former graduate institutions may be allowed to count toward degree. Coursework earned ten years or more prior to admission to a doctoral degree is not allowed to satisfy requirements.

PRIOR COURSEWORK REQUIREMENTS: UW–MADISON UNDERGRADUATE

With program approval credits from graduate level courses (numbered 300 or above) taken as an undergraduate at UW–Madison may be allowed to count toward degree up to 7 credits. Coursework earned ten years or more prior to admission to a doctoral degree is not allowed to satisfy requirements.

PRIOR COURSEWORK REQUIREMENTS: UW–MADISON UNIVERSITY SPECIAL

With program approval, coursework numbered 300 or above taken as a UW–Madison Special student may be allowed to count toward the degree up to 15 credits. Coursework earned ten years or more prior to admission to a doctoral degree is not allowed to satisfy requirements.

CREDITS PER TERM ALLOWED

12 credits

PROGRAM-SPECIFIC COURSES REQUIRED

Enrollment for NTP 900 Neuroscience Seminar: Current Topics in Neurobiology each semester; NTP/PHMCOL-M/PHYSIOL 610 Cellular and Molecular Neuroscience Cellular and Molecular Neuroscience; NTP/ANATOMY/PHMCOL-M/PHYSIOL/PSYCH 611 Systems Neuroscience Systems Neuroscience; NTP/PHYSIOL 700 Professional Development for Biomedical Graduate Students Professional Development; one intermediate/advanced course in molecular/cellular/developmental neuroscience; one intermediate/advanced course in systems/behavioral neuroscience; and other advanced courses as recommended by the advisory committee.

DOCTORAL MINOR/BREADTH REQUIREMENTS

Completion of a doctoral minor is not required of students in the NTP doctoral program.

OVERALL GRADUATE GPA REQUIREMENT

3.00 GPA Required

OTHER GRADE REQUIREMENTS

The Graduate School requires an average grade of B or better in all coursework (300 or above, not including research credits) taken as a graduate student unless conditions for probationary status require higher grades. Grades of Incomplete are considered to be unsatisfactory if they are not removed during the next enrolled semester.

PROBATION POLICY

Failure to pass the preliminary examination before the start of the spring semester of the third year will result in being placed on probation. Two consecutive semesters of enrollment on probation precludes continuation in the program.

ADVISOR / COMMITTEE

Candidates must select the advisory committee by the end of the second semester of the first year of graduate study.

ASSESSMENTS AND EXAMINATIONS

Candidates must meet with their advisory committee once per semester until they become a dissertator and then once per year thereafter.

The preliminary examination consists of two papers: a dissertation proposal, and a critical research paper unrelated to the proposal. The preliminary examination should be completed by the end of the second summer of graduate study. Students who fail one or both parts of the preliminary examination may retake the examination within two months. Failure to pass the examination the second time will result in dismissal from the program.

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The final dissertation must be submitted to the advisory committee and an oral defense of the thesis must be given. The thesis defense consists of a public presentation of the thesis followed by a closed meeting with the advisory committee. Deposit of the doctoral dissertation in the Graduate School is required.

TIME CONSTRAINTS

The final dissertation must be completed by the end of the fifth academic year. If the dissertation is not completed by the end of the summer following the sixth academic year, the student’s advisory committee must meet with the steering committee to present a written statement explaining why the dissertation has not been completed.

LANGUAGE REQUIREMENTS

No language requirements.

ADMISSIONS

The admissions deadline for the neuroscience training program is December 1. No exceptions will be made for late materials so we strongly encourage prospective applicants to send in required materials as early as possible. Admission to the program is based mainly on demonstrated ability and interest in science and mathematics. The minimum course prerequisites are mathematics through calculus and a year each of chemistry, physics, and biology. All course prerequisites must be taken at the college level. Applicants for admission must submit all undergraduate and graduate transcripts directly to the neuroscience training program, three letters of recommendation, scores from the GRE general test, and a statement of research interests and goals. Prior laboratory research experience, though not required, is a component of successful applications.

For more information about neuroscience training program admissions, see the admissions tab on the program website (http://ntp.neuroscience.wisc.edu/admissions.htm).

Prospective international students should visit the program website (http://ntp.neuroscience.wisc.edu/admissions-international.htm) for more information related to international admissions.
LEARNING OUTCOMES

KNOWLEDGE AND SKILLS

- Students will develop the knowledge base necessary for a career as an independent, professional scientist.
- Students will demonstrate an in-depth understanding of the current knowledge, research questions, research findings and methodologies within their specific field of neuroscience.
- Students will acquire breadth of knowledge in several areas of neuroscience through directed reading and participation in seminar subgroups.
- Students will develop critical thinking skills. They will evaluate the scientific literature, evaluate evidence for and against hypotheses, identify knowledge gaps, identify strengths and weaknesses in existing literature, synthesis knowledge, and develop conclusions.

RESEARCH

- Students will develop and complete original research that advances their specific area of neuroscience.
- Students will formulate ideas, concepts, and experimental design beyond the current boundaries of neuroscience knowledge.
- Students will evaluate and interpret professional scientific literature and use this information to develop theoretical frameworks, testable hypotheses, and predictions for their own research projects.
- Students will receive training and experience with leading edge technologies currently driving the neuroscience field.
- Students will design research projects and prepare necessary protocols.
- Students will conduct independent research and analyze and interpret resulting data.
- Students will prepare and submit manuscripts resulting from their independent research for publication in professional, peer-reviewed journals.

COMMUNICATION

- Students will learn to effectively communicate to diverse audiences through writing, oral presentations, and discussions.
- Students will write clear and concise research articles for publication in professional, peer-reviewed journals.
- Students will present their research at scientific conferences and in formal and informal seminars.
- Students will learn methods of communication needed to interact with professional colleagues and to request grant support.
- Students will present research articulately and informatively to diverse audiences.
- Students will have opportunities to engage in public outreach and education.

TEACHING

- Students will learn teaching and mentoring skills necessary for future scientific careers.
- Students will receive training and serve as teaching assistants for an approved course or outreach program.
- Students will have opportunities to mentor others in a laboratory or research setting.

PROFESSIONAL CONDUCT LEARNING GOALS

- Students will receive training in responsible conduct of research, and will learn and foster principles of ethical and professional conduct.
- Students will learn to use scientific rigor when designing experiments, collecting and analyzing data, interpreting and reporting results.
- Students will be trained in the ethics of publishing.
- Students will know and adhere to laws, regulations, occupational health and safety standards.

ADDITIONAL LEARNING GOALS

CAREER PREPARATION

- Students will be provided with diverse training that will prepare them for a range of flexible and sustainable careers (e.g., academia, industry, government, science policy and administration, science commerce, science writing, law, and science education and outreach at all levels).
- Students will develop broadly applicable skills in critical thinking and problem solving.
- Students will have opportunities to develop skills in leadership, project management, teamwork, and communication and to develop collaborations with nonacademic partners.

PEOPLE

Faculty: Professor Mary Halloran (director). For a comprehensive faculty list, visit the program website (http://ntp.neuroscience.wisc.edu/faculty-research.htm).