

**APPLICATION PROCESS FOR
MD-MS PROGRAM IN MEDICAL NEUROBIOLOGY
Department of Neurobiology and Anatomy
University of Rochester, School of Medicine and Dentistry**

Please read this Guide carefully. Failure to follow directions may compromise the application.

Program Overview

This institution has an enduring history of training physician-scientists interested in academic careers that combine teaching, clinical medicine, and research, or similarly broad careers in industry or government. As part of a broad initiative to establish an Academic Research Track (ART) within the medical school curriculum, the Department of Neurobiology and Anatomy offers an MD-MS Program in Medical Neurobiology. This five-year Program adds an additional year of study, research and teaching experience to the medical curriculum, culminating in a Master of Science Degree (MS) in Neurobiology and Anatomy that is conferred along with the MD degree upon graduation.

The overall goal of the Program is to engage students in academically oriented training early in their medical education. This in turn will prepare them for comparably oriented residencies and fellowships that will ultimately lead toward faculty positions in US medical schools as physician-scientist-educators and leaders of the future. Further, the MD-MS path is designed to seamlessly extend into an MD-PhD for those so inclined. Nearly half of our past students have taken this route, all as a result of their MS year.

Introduction to the Department

The Department of Neurobiology and Anatomy (NBA) is strongly committed to its major academic missions of research and education. All primary and secondary faculty actively engaged in teaching and/or neurobiology research are available as mentors, and the range covers a broad spectrum of interests, including sensory, motor and integrative systems, cell signaling and transmission, development and aging, neurobiology of disease, learning and plasticity, cognition and perception, neuro-engineering, and computational neurobiology. For students joining the Program, this translates into a highly attractive environment leading toward careers as clinician/scientists of the future.

Curriculum

The Program builds upon two major science-oriented courses taken during the first two years: *Mind, Brain, and Behavior (MBB-ANA 525)* and *Human Structure and Function (HSF-ANA 526)*. Additional requirements will be acquired during a fifth year of training beginning typically in July of Y2 or Y3 of the medical curriculum. **Research during the summer after Y1 is strongly encouraged**, though not necessarily in direct relation to the thesis project. Options for summer support are available through the Office of Medical Education. One of them is directly related to neuroscience, and operates within the *Schmitt Program on Integrative Brain Research*.

Requirements for the MS degree total 32 credits. This includes 10 from *prior MD classes* (HSF:ANA 526 & MBB: ANA 525), 12 from *research training, thesis project and defense* (publishable paper and a presentation), 3 from *teaching*, 4 from *other requirements* (ethics, student seminar, journal club) and 3+ *elective* from NSC, ANA, and BCS listings.

- A **Thesis Advisor** from the Department's faculty must be identified by the student, given acceptance by the faculty member and the Program Directors. An Advisor from outside NBA can be acceptable, but requires a Co-Advisor from within the Department.
- A **Thesis Committee** must be selected by the student and their Advisor, to include at least two primary faculty from NBA and one outside the Department.
- It is possible, and encouraged, to **extend the MS year into a PhD program** for students sufficiently engaged as to desire the additional commitment. There have been many precedents—nearly half. Confer with the Program Directors as interest develops.

Sample Curriculum:

Fall

IND 501 – Ethics & Prof Integrity in Research (1.0 credit)
 ANA 521 – Graduate Journal Club (1.0 credit)
 ANA 495 – Masters Research (variable credits)
 ANA 581 – Teaching Tutorial (3.0 credits)
 Electives (0-4 Credits)

Spring

ANA 521 – Graduate Journal Club (1.0 credit)
 ANA 522 – Student Seminar (1.0 credit)
 ANA 495 – Masters Research (variable credits)
 Electives (0-4 Credits)

The MS requires the writing of a thesis-dissertation (effectively a publishable manuscript for submission to a recognized peer-reviewed journal relevant to the area of research) and the passing of an oral examination. The dissertation must show independent work, the ability to plan and execute a study as well as present the work in an orderly fashion, and acquaintance with the literature of a limited field. [Preparing Your Theses: A Manual for Graduate Studies](#) is used to prepare masters theses. The dissertation must be registered with the Associate Dean for Graduate Studies, and copies given to the examining committee at least two weeks prior to the oral examination.

Application and Admission.

The Department anticipates that 1-3 medical students will be selected each year for this competitive program. The **application is through the CTSI (Clinical Translational Science Institute)** : <https://www.urmc.rochester.edu/ctsi/funding/t11-pre-doc-training.cfm> , with a complete **copy sent to the MD-MS Program Directors**.

A **visit/interview with the Program Directors** is an essential first step in guiding students through the process and to best match interests with the options ahead.

Support for students in the Program (stipend and tuition) is provided by the School of Medicine and Dentistry, and from research funds through the student's Advisor (partial stipend and health insurance). This is typically through the CTSI training grant. However, other training grants exist in departments and centers that provide alternatives, in relation to affiliations of the research Advisor.

Further information may be obtained through the web:

<http://www.urmc.rochester.edu/education/graduate/masters-degrees/medical-neurobiology.aspx>

and by contacting the *Program Directors*:

Gary D. Paige, MD, PhD, Departments of Neurology and Neurobiology & Anatomy, Director
(gary_paige@urmc.rochester.edu)

John A. Olschowka, PhD, Department of Neurobiology & Anatomy, Co-Director
(John_Olschowka@urmc.rochester.edu)

Students should also feel free to contact MD-MS students currently in the Program, as well as members of the NBA teaching faculty who have extensive exposure to medical students during the first and second years of the medical curriculum.