

Neurosciences Program

The KU-L/KUMC bicampus Neuroscience Graduate Program (<http://www.neuroscience.ku.edu/>) is designed to prepare the student for a career in research and/or teaching, with concentrations in neuroscience. The program emphasizes acquiring the skills and knowledge to perform and disseminate the results of neuroscience-based research. The course of study in the program is broadly based to assure that graduates are well-versed in a number of areas of neural research, spanning from molecular to systems neuroscience. The research opportunities in the program are widely varied and will accommodate many interests; students are encouraged to enroll in courses offered by other programs or departments.

Nearly all Ph.D. students in the Neuroscience Graduate Program at the KU School of Medicine initially gain entry through the Interdisciplinary Graduate Program in the Biomedical Sciences (IGPBS). After the initial year of course work, students who join the laboratory of a Neuroscience graduate faculty member may seek entry into the program. Coursework for the Neuroscience Graduate Program is offered at the KU Medical Center campus in Kansas City, KS, as well as the University of Kansas in Lawrence, KS. Several courses are taught across both campuses via videoconferencing. Comprehensive Exams for all students must be completed by the fall of the 3rd year in Graduate School. The program on the KUMC campus is directed by the KUMC Neuroscience Graduate Studies Committee consisting of the following faculty:

KUMC Graduate Studies Committee Members:

Julie Christianson, Ph.D. (Program Director)

Kyle Baumbauer, Ph.D.

Jill Morris, Ph.D.

Heather Wilkins, Ph.D.

Erin Young, Ph.D.

Applications may be made online at: Interdisciplinary Graduate Program in Biomedical Sciences (IGPBS) (<http://www.kumc.edu/igpbs.html>). Inquires related to the KUMC portion of the program may be directed to the Program Director:

Julie Christianson, Ph.D.

Professor, Department of Cell Biology & Physiology

Director, Neuroscience Graduate Program, KUMC Campus

University of Kansas Medical Center

Kansas City, KS 66160

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Courses

NEUS 799. Neuroscience Seminar Series. 1 Credits.

Presentations of research papers by faculty, post-doctoral research associates, and graduate students. All graduate students in the Neuroscience program participate in this seminar series throughout their

period of training. Each student has to present a seminar once every semester. Presentations by students are evaluated by other graduate students and faculty at the end of each seminar. (Same as NURO 799) Prerequisite: Graduate standing in the Neuroscience program.

NEUS 844. Neurophysiology. 3 Credits.

Somatosensory, motor and cognitive function of the brain will be discussed using a combination of lecture and student presentation formats. Current issues and evidence underlying accepted concepts and mechanisms will be emphasized. (Same as NURO 844 and PHSL 844.) Prerequisite: PHSL 846 or equivalent and consent of instructor.

NEUS 845. Graduate Histology. 3 Credits.

This course will bridge student knowledge of systems/organs with cellular histology and is designed as an accelerated introduction to histological techniques, microscopy/optics, and histology of normal and diseased tissues. Classes meet once a week and the format includes a 1 hour lecture on individual tissues within related organ systems followed by 1 hour of microscopic observation. Prerequisite: Completion of the IGPBS core curriculum or consent of instructor.

NEUS 846. Advanced Neuroscience. 4 Credits.

Team-taught, in-depth neuroscience course focusing on normal and diseased brain function at the molecular, cellular and systems levels. Lectures and discussions will emphasize current issues in neuroscience research. (Same as ANAT 846, PHCL 846, and PHSL 846.) Prerequisite: Permission of the course director.

NEUS 847. Developmental Neurobiology. 2 Credits.

Development of the nervous system from early induction to the development of learning and memory. Topics include: Induction; Cellular Differentiation; Axon Growth and Guidance; Target Selection; Cell Survival and Growth; Synapse Formation; Synapse Elimination; and Development of Behavior. (Same as ANAT 847 and PHSL 847.) Prerequisite: Advanced Neuroscience (ANAT 846; NURO 846; PHSL 846) or consent of instructor.

NEUS 848. Molecular Mechanisms of Neurological Disorders. 3 Credits.

An in-depth coverage of pathogenic mechanisms in neurological diseases; cellular and molecular responses to brain injury and disease, neuroinflammatory diseases (e.g., multiple sclerosis), neurodegenerative diseases (e.g., Alzheimer's, Parkinson's, Huntington's, amyotrophic lateral sclerosis, and prion diseases), neurogenetic diseases (e.g., lysosomal and peroxisomal disorders, Down's syndrome and fragile X), trauma, stroke, and viral diseases (e.g., HIV encephalitis). (Same as ANAT 848, PHCL 848, and PHSL 848.) Prerequisite: Advanced Neuroscience (ANAT 846, PHCL 846 or PHSL 846) or an equivalent course and consent of instructor.

NEUS 850. Sensory Biology. 2 Credits.

A variety of topics associated with sensory biology, including olfaction, vision, audition, equilibrium, and the visceral and somatic senses will be discussed relative to basic functions and in disease settings. Faculty will provide lectures throughout the semester and research article discussions will be woven into the content throughout the course. Prerequisite: Student must be admitted to the IGPBS program or equivalent.

NEUS 851. Clinical and Biological Basics of Dementia. 1 Credits.

This course will cover the major aspects of dementia research methodology, ranging from basic science to clinical and translational research. There will be a broad introduction to Alzheimer's Disease and Dementia including history, basic science, advanced analysis methods, and social and cultural ramifications. We will further cover topics such as clinical trial design, inclusion and ethical considerations, and translation into clinical practice. The course will include both didactic lectures

and journal clubs. Prerequisite: Advanced Neuroscience (NEUS 846; ANAT 846; PHSL 846) or consent of the instructor.

NEUS 899. Neuroscience Master's Thesis. 1-11 Credits.

Hours and credit for this course to be arranged with the mentor.

Independent investigation of a research problem in neuroscience, but of limited scope. Prerequisite: Graduate standing in the Neuroscience program and consent of mentor/instructor.

NEUS 900. Scientific Papers in Neuroscience. 1 Credits.

Neuroscience research articles are analyzed by the student with the guidance of an instructor in terms of quality of scientific content and mechanics of the presentation. One or more articles are discussed in each tutorial session. The research topics and the instructor are chosen in accordance with the research interest of the students. Prerequisite: Graduate standing in the Neuroscience program post-oral comprehensive examination and consent of mentor/instructor.

NEUS 990. Research in Neuroscience. 1-9 Credits.

Original and independent investigation, approved by and conducted under the supervision of the students' advisor and advisory committee, in partial fulfillment of the requirements for the Ph.D. degree. Prerequisite: Consent of advisor.

NEUS 999. Neuroscience Doctoral Dissertation. 1-11 Credits.

Hours and credit for this course to be arranged with the mentor. Conduct of original investigation in neurosciences. Prerequisite: Graduate standing in the Neuroscience program post-oral comprehensive examination and consent of mentor/instructor.