

INDIANA UNIVERSITY



Sherry F. Queener, Ph.D.
Director of the Graduate Office, IUPUI
Associate Dean of the Indiana University Graduate School

SCHOOL OF MEDICINE

Friday, April 11, 2008

Dear Dr. Queener,

Please find attached documents describing proposed revision of the M.S. degree program in Medical Neuroscience, IU School of Medicine. The reasons for the changes are summarized in the provided letter from Dr. Nicol. As you know, the IUSM has made many recent changes to our course structures as part of the switch to open enrollment and this new description of the Medical Neuroscience M.S. incorporates those new courses.

Thank you for your consideration,

A handwritten signature in black ink that reads "S. J. Rhodes".

Simon J. Rhodes, Ph.D.
Associate Dean for Graduate Studies
Indiana University School of Medicine
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Medical Neuroscience Graduate Program

Indiana University School of Medicine



From Molecules to the Mind

April 10, 2008

RE: Revision of the MS degree program for medical Neurosciences

Simon J. Rhodes, Ph.D.
Associate Dean for Graduate Studies
Indiana University School of Medicine

Dear Dr. Rhodes:

The MS degree for the Medical Neurosciences program has been revised. These changes are described in the attached document. The revision is based in the new curriculum defined by the IBMG program such that the previous program was no longer applicable to the present. The previous program required a total of 30 credit hours, a thesis, and a final oral examination. The revised program still calls for 30 credit hours and either a written thesis or a final written grant-type proposal that will be defended by an oral examination. These requirements are described in the attached document. I hope that you will find these changes sufficient.

Sincerely,

Grant Nicol, PhD
Director of Graduate Studies
Medical Neurosciences

VII. Course Requirements for a Master's Degree

A thesis or non-thesis Master's degree is available in the Medical Neurosciences program. This involves course work, a single laboratory rotation and a requirement for the successful completion of both a written and oral final examination. This program contains a total of 30 credits. All rules and regulations of the Graduate School relative to the Master's program apply.

A. Specific Coursework Requirements and Electives

Fundamental Neuroscience I Electrical Signaling and Ion Channel Biology	G743 - Membrane potentials and voltage-gated ion channels and their contribution to signaling in the nervous system.. Three lecture/discussion hours per week (5 weeks). <i>Spring</i> Cummins and staff. <i>One credit.</i>
Fundamental Neuroscience II Neuropharmacology of Synaptic Transmission	G744 - Neuropharmacology of synaptic transmission; postsynaptic receptor biology; ionotropic/metabotropic receptors; pharmacodynamics of ligand-receptor interactions. Three lecture/discussion hours per week (5 weeks). <i>Spring</i> Nicol and staff . <i>One credit.</i>
Fundamental Neuroscience III Intracellular Signal Transduction in Neurons	G745 - Signal transduction in neurons; G-proteins, post-translational events; growth factors; lipid signaling. Three lecture/discussion hours per week (4 weeks). <i>Spring.</i> Hingtgen and staff. <i>One credit.</i>
Fundamental Neuroscience IV Presynaptic Neurotransmitter Regulation & Synaptic Plasticity	N612 - Neurotransmitter dynamics and synaptic plasticity; neurotransmitter transporters; dendritic signaling. Six lecture/discussion hours per week (4 weeks). <i>Fall.</i> Hudmon and staff. <i>Two credits.</i>
Fundamental Neuroscience V Integrative Neurophysiology and Special Senses	N614 - Special senses and integrative neurophysiology; sensory receptors; simple reflex circuits and analysis. Six lecture/discussion hours per week (4 weeks). <i>Fall.</i> DiMicco and staff. <i>Two credits.</i>
Fundamental Neuroscience VI Developmental Neurobiology	N616 - Developmental neurobiology; axon guidance; neuronal stem cell biology; patterning in the nervous system. Six lecture/discussion hours per week (4 weeks). <i>Fall.</i> Lee, Hashino and staff. <i>Two credits.</i>
Graduate Neuroanatomy	D527 - A comprehensive course in functional neuroanatomy for graduate students. Three lecture hours per week (16 weeks). <i>Spring.</i> Kubek and staff.
Research in Neuroscience	N800 – Research in laboratories of faculty mentors. Rotation experiences designed to expand technical exposure of trainees. <i>One credit.</i>
Neuroscience Seminar	N801 - Required of all 2nd year trainees. Students work in teams to develop brief formal presentations on their own research and/or on the research of forthcoming visiting neuroscientists to Indianapolis. 1 hour/week. <i>Fall and Spring.</i> Neuroscience Training and Advisory Committee.

Below is a table giving an example of a typical two year sequence for students entering the Medical Neuroscience M.S. program. The particular sequence may vary depending upon the background and interests of the students.

Fall Semester	Spring Semester	Summer Sessions
Year 1 of Training Program		
Biomed 1, 2, 3 (G715, 716, 717) 6 credits	Fundamental Neuroscience I-III (G743, 744, 745) 3 credits	Research rotation 2 credits
Consultation with TAC to assist in selection of optimum rotations/electives	Other IBMG electives (see Appendix below) 3 credits	
Exploring Neuroscience: The Stark Neuroscience Research Institute Seminar Series	Exploring Neuroscience: The Stark Neuroscience Research Institute Seminar Series	
Year 2 of Training Program		
Fundamental Neuroscience IV-VI (N612, 614, 616) 6 credits	Graduate Neuroanatomy (D527) 3 credits	MS Final Exam
Research Ethics (G505) 1 credit	Other IBMG electives (see Appendix below) 3 credits	
Exploring Neuroscience: The SNRI Seminar Series	Exploring Neuroscience: The SNRI Seminar Series	

B. Elective Courses

A number of acceptable elective courses are offered by various departments and programs in the School of Medicine (see Appendix below). These courses would be taken during the second semester of the first year and during the entire second year of the program. Many of the required and elective courses are 5 week modules of study and include such topics as cellular signaling in carcinogenesis, advanced molecular imaging, and animal models of human disease. The student is encouraged to consult the Training and Advisory Committee (TAC) to help in the selection of suitable electives that are both academically appropriate and consistent with the student's career plan.

C. The Final Examination

As a final examination for the MS degree, the student has available two choices. One possibility is that the student can write a thesis describing their research work during the course of their program. The thesis would be written in consultation with their research mentor. Another possibility is that the student could write a proposal that would attempt to investigate a current question in neuroscience. The student would outline the problem and then propose a series of studies that would then provide experimental solutions to the proposed question. Upon

completion of either choice, the student is expected to defend the ideas and the results obtained for the thesis or the submitted proposal in an oral examination given by the Training and Advisory Committee.

Appendix

Indiana University BioMedical Gateway (IBMG) program
Spring courses

First third of semester	Second third of semester	Last third of semester
G724 Molecular Cancer Genetics	G852 Concepts of Cancer Biology (2 cr)	
G749 Introduction to Structural Biology	G848 Bioinformatics, Genomics, Proteomics, and Systems Biology (2 cr)	
G807 Structural and Chemical Biology (2 cr)		G725 Gene Therapy
G817 Molecular Basis of Cell Structure and Function (2 cr)		
G729 Introduction to Immunological Systems	G720 Stem Cell Biology	G728 Fundamental Concepts of Infection and Pathogenesis
G726 Developmental Genetics	G727 Animal Models of Human Disease	G746 Chromosome Instability and Disease*
G737 Introduction to Histology	G736 Endocrine and Gastrointestinal Function in Health and Disease	G735 Cardiovascular, Renal and Respiratory Function in Health and Disease
D851 Histology (4 cr)		
G733 Introduction to Biological Microscopy	G734 Advanced Molecular Imaging (2 cr)	
G743 Fundamentals of Electrical Signaling and Ion Channel Biology	G744 Neuropharmacology of Synaptic Transmission: Receptors and Ligands	G745 Fundamentals of Intracellular Signal Transduction in Neurons
G747 Principles of Pharmacology		
G748 Principles of Toxicology 1	G754 Principles of Toxicology 2	G755 Principles of Toxicology 3

*not offered until spring 2009