

ILLINOIS WESLEYAN UNIVERSITY

Application for SPECIAL INTERDISCIPLINARY MAJOR OR MINOR

Your name: Sarah Hartman

Date: 4/25/11 (signed)

Your ID #: 900212887

8/26/11

I wish to apply for a (circle) Special Interdisciplinary Major or Minor

to be administered under the Department of _____

Special Interdisciplinary Major

Neurophysiology

Special Interdisciplinary Minor

to be administered under the Department of _____

(two sponsors are required)

Biology Dr. _____

Psychology Dr. _____

I plan to complete a (circle) BA in the (circle) FALL SPRING MAY
SUMMER TERM of 2012 (year).

Current GPA 3.93

Total course units earned to date: 27 (total)

Present Major (if any) Biology

15.5 in credit earned

N.B. It is NOT possible to double major between the College of Liberal Arts and such requests must be to seek two degrees which will require at least an additional nine unique course units beyond the highest number required for one degree.

Information for the Department of _____

Please provide the information required on the other side of this form attaching

1. Briefly list the academic goals to be achieved by your proposed program of study. Describe how this program of study better serves your academic goals than any existing major (or minor) program.

(see attached sheet)

2. Attach a list of the proposed Special Interdisciplinary Major or Minor sequence, indicating which courses have yet to be completed. (Majors must include at least ten courses from at least two departments, and a senior project.)

that the intent or spirit of the academic requirement has or will be fulfilled

AUTHORIZATION

After completing the above information, obtain the following signatures in order:

1. Your Signature [Signature] Date 4/25/11

2. Chair/Director [Signature] Date 4/26/2011
(of the co-sponsor of the special interdisciplinary major or minor - required)

3. Chair/Director Joe Williams Date 4/26/11
(of the co-sponsor of the special interdisciplinary major or minor - required)

4. Faculty Advisor Joe Williams Date 4/26/11

For processing by Curriculum Council, please deliver form and attachments to the Mellon Center, 122 Stevenson Hall.

Chair of Curriculum Council _____ Date _____

Date Filed with the Registrar _____

NEUROPSYCHOLOGY

Interdisciplinary Proposal

Sarah B. Hartman

Neuropsychology is an interdisciplinary field that examines the relationship between neurobiology, behavior and psychological phenomena. The academic goals of this program include:

- Combine studies in psychopharmacology, genetics, and systems neuroscience, with behavioral neuroscience and cognitive sciences.
- Gain an understanding of the brain and behavior from the macro level to the micro level (e.g. brain regionalization, telomere communication, neuronal cellular signaling, genetic synaptic plasticity)
- Prepare me to both basic and applied scientific research in neuropsychology.
- Provide an understanding of normal adult behavior, as well as behavioral consequences of brain injury, neurobiological abnormalities, and drug actions.
- Provide a background conducive for competitive entry and success in medical school and in pursuit of related occupations in the medical field (e.g. neurosurgery, neurology, psychiatry)

I am an affable, intelligent, and motivated Neuroscience student toward the goal of obtaining a medical degree and specializing in a neuroscience. I would like to conduct neuroscience research as a physician while studying to become a neurologist or a neurosurgeon. These specializations both require thorough understanding of brain structures and functions, and their relationship to behavior. I have selected courses with this focus in mind, and I believe that I have designed a cohesive curriculum to suit my unique interests and career trajectory.

An outstanding example of my interest and commitment to the study of neuropsychology is my research experience at the University of Illinois Chicago Medical Center, Department of Neurology. I worked 20 hours/week with the Magnetic Resonance Research Laboratory as a research assistant to Dr. Deborah Little. I investigated the relationship between cerebellar diffuse axonal injury and neurometabolic dysfunction in patients with cerebellar atrophy. We used Diffusion Tensor Imaging (DTI) data analysis of MRI data, plotting regions of interest in the medial, superior, and inferior regions of the cerebellar peduncle. I have just completed an extensive literature search of cerebellar and TBI for the introduction to the first publication from this research, which is in the process of

In a second study, I collected additional DTI data on patient MRIs to examine structural layers of the corpus callosum and their differential sensitivity to shearing

and axonal injury in brain trauma. I also determined specific brain atlas regions highlighted on functional MRI slices of transgenic mice that were exposed to standard or enriched environments to serve as a model for Alzheimer's disease.

disease (AD), those with mild cognitive impairment or vascular dementia, and healthy controls. I completed HIPAA training and IRB education and was trained to independently administer cognitively sensitive tests including the Mini-Mental State Exam, the Alzheimer's Disease Assessment Scale (ADAS), and the Dementia Rating Scale.

each. I had the opportunity to observe the test battery being administered to participants and attend their MRIs at the IHC Medical Center clinic. My experiences doing neuroscience research provided me with valuable real-world experience and co-authorship of a peer reviewed journal submission.

In addition to my experiences this summer, I studied in Denmark during a 2010 semester abroad and participated in a field study at the Center of Functionally Integrated Neuroimaging at Aarhus University Hospital. At the Center, I learned about forefront research projects and state-of-the-art neuroimaging technology.

Overall, my research and clinical experience in neuroscience and neuropsychology provide a strong supplement to the academic curriculum I have completed this semester, and exploring new territory in my research thesis. This semester, I am

investigating the role of neurosteroids, specifically allopregnanolone, in learning and memory. We plan to conduct a series of behavioral tasks on rats receiving neurosteroid injections/placebo to determine which of allopregnanolone's cognitive and behavioral effects are due to its anxiolytic properties, mediated at GABA-A receptors, and which are directly due to effects on learning and memory pathways. Our investigation holds implications for the safety and efficacy of hormone replacement therapy.

I am very excited about the unfolding of my Neuropsychology studies and my future in the field. I am confident that my research and clinical experiences will support me in this unique and exciting Major. Thank you for your time and consideration.

Major Sequence

GENERAL BIOLOGY WITH LABORATORY (BIOL 101) Completed, Grade: A
Provides foundation for understanding biological forms and functions in the context of evolution. Includes discussion of nervous system and neurobiological functions in humans and in animals.

ADVANCED BEHAVIORAL NEUROSCIENCE (PSYC 313) *Writing Intensive*

Completed, Grade: A

Provides opportunity for a thorough investigation of neural biological substrates and neurological properties in learning, perception, and memory. Mentored in a laboratory setting and provided an opportunity to design and conduct an independent research project. In my independent research paper (15 pages), I investigated the hypothesis of whether abnormalities in the hippocampus affect the ability of Discolor Disease.

NEUROSCIENCE HONORS COLLEGE (NSH 304)

Will be completed in Fall 2011

Investigates the biological actions of drugs and chemicals in the brain and their behavioral effects. Includes laboratory procedures. Research on pharmacokinetics and cellular pathways acted upon by varying chemical agents.

INTRODUCTION TO CELLULAR AND MOLECULAR BIOLOGY (BIOL 201)

Provides an introduction to cellular biology and molecular mechanisms of cell signaling and cell communication.

**See addendum.*

STATISTICS (PSYC 290) Completed, Grade: A

Enhances understanding of various statistical and research methods used in psychological research.

RESEARCH METHODS IN DEVELOPMENT (PSYC 200) *Writing Intensive* Completed

Provides foundation for conducting original research to investigate hypotheses and study neurobehavioral phenomena in a controlled environment. For my extensive research paper (19 pages), I designed a study to characterize the perception are present in TTM and may be correlated to specific brain regions of abnormality. Course provides valuable experience for designing research, analyzing results using SPSS, and drawing conclusions from data.

GENETICS (BIOL 312) Completed. Grade: B

Provides understanding of DNA replication, gene transcription/translation, genetic inheritance, and other genetic activities relevant in understanding the impact of specific gene-based processes involved in neurological processes i.e. long-term potentiation and synaptic plasticity.

PREPARATION FOR ANIMAL BEHAVIORAL RESEARCH (BIOL 313) Completed. Grade: A

Provides understanding of the basic principles of animal behavior and the preparation for animal behavioral research.

Completed at Sarah Lawrence College. Grade: A, B+

Provides basic understanding of chemistry as a foundation for relevant biochemical

ORGANIC CHEMISTRY WITH LAB (CHEM 223, CHEM 312) Grade: B, TBA

drive biological processes

Will be completed in Fall and Spring of 2012

Provides understanding of the chemical forces that govern chemical and neurochemical reactions.

INTERDISCIPLINARY RESEARCH PROJECT IN COGNITIVE SCIENCE (PSYC 471) Completed. Grade: A

Provides an understanding of a research project in cognitive science, ranging from perception from both empirical and theoretical perspectives. Course includes critique of primary literature and is supplemented with bi-weekly collaboration with a professor to provide guidance and discuss progress for an independent study on a topic of my choosing. I wrote and presented a 26-page literature review titled Music and The Brain.

research.

HUMAN HEALTH AND DISEASE: A CLINICAL APPROACH (BIO 260) Completed at the Danish Institute for Study Abroad. Grade: A

Course will provide an opportunity for clinical exposure and study of medicine in the context of medicine. The curriculum provides valuable hands-on medical

practices and health provision in a variety of countries. Curriculum includes conducting neurological exams, clinical history, physical exams, and medical procedures such as lumbar puncture and IV insertion. Field studies include visits to the Center of Functionally Integrative Neuroscience located in Århus, Sønderborg, Denmark at Aarhus University Hospital, and to Helios Klinikum, in Berlin, Germany—both are at the forefront of neuroscience and neurology research.

PSYC 401)

Will be completed in Fall and Spring of 2012

Provides an opportunity for me to synthesize my knowledge and demonstrate competence via conducting original neuroscience research with a faculty member.

***Addendum**

Introduction to Cellular and Molecular Biology will be taken as a lecture course for biology and psychology department chairs, Dr. David Bollivar and Dr. Joe Williams. The purpose of this is to allow the course to be taken during the fall 2011 semester in conjunction with demanding courses that also emphasize lab and scientific writing (i.e. Directed Research Thesis, Physics with Lab, and Neuropsychopharmacology.)

