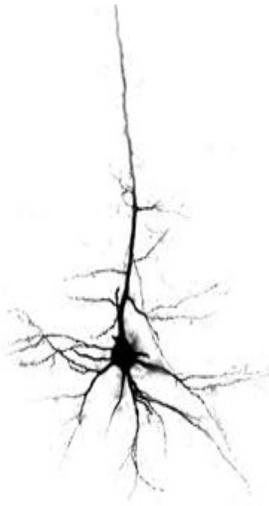
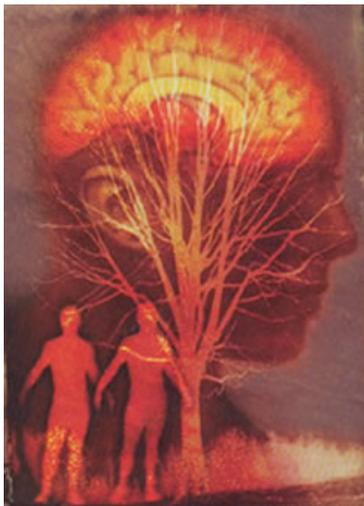


# **HEMINGWAY COLLABORATIVE PROJECT: WSU NEUROSCIENCE INITIATIVE**

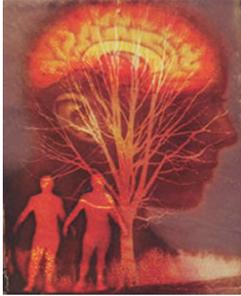
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**2007-2008 ANNUAL REPORT**

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2007-2008 ANNUAL REPORT**



Funded by a Hemingway Collaborative Grant (and funds from three separate colleges and three departments), the Neuroscience Initiative is an interdepartmental effort to: a) assess and report on WSU student and faculty interest in neuroscience; b) design a set of neuroscience courses that could be “stand-alone” offerings, or serve as a core for a minor or major; c) engage and educate WSU students and faculty on neuroscience topics by inviting internationally-renowned scientists from nearby universities to speak on campus, and; d) build neuroscience research collaborations for faculty and students that would be competitive for extramural funding.

**Project Director:** Dr. Matthew Schmolesky (Psychology). **Core participants:** Drs. Lauren Fowler (Psychology), Jim Hutchins (Health Sciences), and Barbara Trask (Zoology). **Additional participants:** Drs. Eric Amsel (Psychology), Aaron Ashley (Psychology), Norris Bancroft (Psychology), Nicole Berthelemy-Okazaki (Zoology), Jonathan Clark (Zoology), Stephen Clark (Botany), Marie Kotter (Health Sciences), Ron Meyers (Zoology), and Sam Zeveloff (Zoology).

**College and Departmental Support:** \$1000 each from Deans Conroy (Health Professions), Ostlie (Science), and Sadler (Social and Behavioral Sciences); \$200 each from Chairs Amsel (Psychology), Kotter (Health Sciences), and Zeveloff (Zoology).

Since September, 2007, Neuroscience Initiative (NI) members have made exceptional progress in a wide range of activities that support the initial NI goals.

**Gauging interest in neuroscience at WSU**

- A survey was developed to gauge student interest in neuroscience coursework, a Neuroscience Minor, or a Neuroscience Major. To date, the survey had been administered to 598 students in over 20 different courses offered by the College of Health Professions, College of Social and Behavioral Sciences, and College of Science. The results of Fall 2007 data suggest strong student interest in the field and are summarized here:

Fall 2007 Neuroscience Student Interest Survey Results

| Question   | <i>Level of Interest (% students)</i> |      |          |        |
|--|---------------------------------------|------|----------|--------|
|  | None                                  | Some | Moderate | Strong |
| How interested would you be in taking another course that has neuroscience as a key topic?   | 9.9                                   | 39.3 | 30.6     | 18.9   |
| How interested would you be now (or would you have been earlier in your studies) in taking a sequence of courses across different academic areas that brings together neuroscience as a central component? | 15.4                                  | 42.3 | 28.3     | 13.5   |
| How interested would you be now (or would you have been earlier in your studies) in a neuroscience minor?  | 24.6                                  | 31.8 | 25.1     | 17.4   |
| How interested would you be now (or would you have been earlier in your studies) in a neuroscience major?  | 38                                    | 31.6 | 18.6     | 10.5   |

**From this data, we can see that out of 598 students:**

- 183 students are moderately interested in an additional course that addresses neuroscience issues, and 113 have strong interest.

- 169 students are moderately interested in taking a sequence of courses that address neuroscience as a central component, and 81 have a strong interest.
- 150 students are moderately interested in a neuroscience minor and 104 have strong interest.
- 111 students are moderately interested in a neuroscience major and 63 have strong interest.
- The 598 students surveyed included 351 women and 238 men (44.6% Freshmen, 24.6% Sophmores, 16.7% Juniors, and 11.2% Seniors).

A variation on this survey is currently being administered to faculty from related departments, and conclusions will be added to a future report. Additional student data is also being gathered.

### **Building Neuroscience Curricula**

- An **Introduction to Neuroscience course** proposal and syllabus were created and approved by the appropriate departments, colleges, and committees. Drs. Matthew Schmolesky (Psychology) and Barbara Trask (Zoology) will teach the course in Fall 2008, and Drs. Lauren Fowler (Psychology) and Jim Hutchins (Health Sciences) will teach it in Spring 2009. *This will be the first neuroscience course taught at WSU.*
- A **Neuroscience Laboratory Methods and Techniques course** has been developed by Dr. Matthew Schmolesky and will be tested with four students in Fall 2008. Drs. Jon Clark and Brian Chung of the Zoology Department have offered assistance with the genetics and histology laboratory sessions, respectively.
- Three additional neuroscience courses are currently being developed: a) Cognitive and Behavioral Neuroscience, b) Cellular and Molecular Neuroscience, and c) Medical/Clinical Neuroscience. We will implement these courses dependent on student interest and need, as well as departmental and administrative support. These courses could form the core of a Neuroscience Minor or Major.
- Financial support was received by an ARCC grant in Summer 2008 to secure additional hardware and software needed to provide WSU students with hands-on neuroscience laboratory experience, both in newly developed courses and in individual research projects. Further support will be sought via internal and external (e.g. NSF) grants in the future.

### **2007-2008 WSU Neuroscience Seminar Series**

- The Neuroscience Initiative has hosted 7 distinguished neuroscientist speakers. The speakers met with faculty, had lunch with students, and gave a one hour research talk. Turn-out for each seminar was high, and potential follow-up interactions with these speakers are very promising. For example, Dr. Tom Parks invited WSU faculty and students to get involved with the newly formed Utah Brain Institute, for which he is the Executive Director. Dr. Jason Watson offered to mentor outstanding WSU students in his laboratory (which uses fMRI to study cognitive abilities) and one of our students, Greg Coronado, is currently working with Dr. Watson. The list of past speakers are provided herein:
  - September 20. **Tom Parks** (Schmolesky hosting) “The promises of neuroscience”
  - October 9. **Leah Krubitzer** (Hutchins hosting) “How does evolution build a complex brain?”

- October 30. **Richard Normann** (Okazaki hosting) “Bionics: new therapeutic approaches to disorders of the nervous system”
  - January 29. **Shannon Odelberg** (Trask hosting) “Identifying the molecular basis for newt limb and spinal cord regeneration”
  - February 26. **Richard Schmidt** (Schmolesky hosting) “The brain: from neuroscience to neurosurgery”
  - March 25. **Jason Watson** (Fowler hosting) “Individual differences in controlled cognition”
  - April 15. **Bryan Benham** (Ashley hosting) "Is neuroscience the new philosophy?"
- A website was created to post the video podcasts of the seminars and to provide additional information to interested faculty and students. The link to this site is: <https://departments.weber.edu/neuroscience/>
  - At the request of NI members, the Honors Program Office has agreed to fund 4 outside neuroscience speakers for the 2008-2009 academic year. Names and dates will be announced as they are scheduled.

#### **Collaborative Neuroscience Research at WSU**

- During this year, NI members applied for and received funding (e.g. Bingham Award, RSPG awards, ARCC grant, etc.) for neuroscience related research that puts a heavy focus on undergraduate training and experience. Students engaged in this research have presented, or been accepted to present, their research at regional and national conferences (e.g. the National Conference for Undergraduate Research).
- Dr. Lauren Fowler has purchased two Biopac neurophysiological hardware/software packages that will be suitable for use in neuroscience-related courses and research. One additional system was purchased using ARCC funds and funds from Dean Sadler that were pledged to the Neuroscience Initiative.

#### **Additional Activities**

- NI members applied for, and received, membership status for WSU with the national Faculty for Undergraduate Neuroscience.
- The Project Director attended the international Society for Neuroscience Conference in San Diego (November, 2007) and met with Faculty for Undergraduate Neuroscience leaders to discuss curriculum development and undergraduate laboratories.
- NI members recruited WSU undergraduates to volunteer time for Brain Awareness Week (March 10-16), a national, annual community outreach effort. WSU students visited local elementary and junior high schools and presented brain information to approximately 20 different classes in 12 separate sessions. They also joined University of Utah Neuroscience Ph.D. students in similar activities in Salt Lake City. It is anticipated the WSU Neuroscience Initiative will expand upon these activities in the future to strengthen community outreach efforts on neuroscience-related topics
- The Project Director attended the 2008 Faculty for Undergraduate Neuroscience Workshop held at Macalester College, St. Paul, MN, July 18-21, 2008. Attendance at the workshop was limited and competitive, and offered a chance to engage with ~80 other

faculty and professionals from diverse institutions (e.g. Central Michigan University, Hope College, NSF, Pomona College, UNC Chapel Hill, University of Wisconsin-Stoat, etc.). Workshop sessions focused on neuroscience curricula and program development, neuroscience for non-majors, stimulations in laboratory sections, funding options, IACUC issues, and public outreach.

### **Future Directions of the Neuroscience Initiative**

Over the past year NI members have held numerous discussions about the creation of interdepartmental neuroscience curricula which could lead to a neuroscience minor, major or program at Weber State University. We have also consulted with faculty from many different colleges and universities that have had experience building neuroscience programs at their institutions. From these discussions and consultations, it is clear that the development of neuroscience at WSU will require not only great interest on the part of WSU students, but also deep support from faculty, chairs, and the administration. The Student Interest Survey carried out in Fall 2007 suggests that students do have great interest in neuroscience. Faculty, chair, and administration support has also been very positive to date.

Our tentative goals for the coming years, dependent upon continued interest and support are as follows:

### **Fall 2008**

- Offer HTHS/PSY/ZOOL 2810 Introduction to Neuroscience for the first time and gauge the success of the course by faculty and student evaluations and comments.
- Test out a Neuroscience Laboratory Methods and Techniques course with four students, registered under PSY 2800/4800 Projects and Research. Gauge the success of each laboratory session, and the course itself using faculty and student evaluations and comments.
- Apply for internal (ARCC) and external (NSF CCLI) bioinstrumentation grants to acquire the equipment needed to expand the Neuroscience Lab course beyond 4 students, going up to 16-20 students. At the same time, seek additional space to carry out student based neuroscience research.

### **Spring 2009**

- Offer HTHS/PSY/ZOOL 2810 Introduction to Neuroscience for the second time and gauge the success of the course by faculty and student evaluations and comments.
- If the Introduction to Neuroscience course is deemed a success, modify it as necessary and submit a new course proposal to College, University and Senate Faculty levels for NEUR 2820 Introduction to Neuroscience to be added to the course catalog. As the “NEUR” prefix would be a new addition, we will submit at the same time a “program” proposal.
- Expand WSU student involvement in the international Brain Awareness Week.

### **Fall 2009**

- Offer Introduction to Neuroscience for the first time under a permanent “NEUR” prefix.
- Dependent upon funding, offer HTHS/PSY/ZOOL 4810 Neuroscience Laboratory Methods and Techniques course for the first time with 16-20 students. Gauge the success of each session, and the course itself, using faculty and student evaluations and comments
- Dependent upon student and faculty interest, consider offering 3810 Cellular and Molecular Neuroscience or 3810 Cognitive and Behavioral Neuroscience, or 3810 Clinical/Medical Neuroscience.

## Spring 2010

- If the Neuroscience Laboratory Methods and Techniques course is deemed a success, modify it as necessary and submit a new course proposal to College, University and Senate Faculty levels for NEUR 4010 Neuroscience Laboratory Methods and Techniques to be added to the course catalog.
- Dependent upon the success of the neuroscience courses taught to date, consider proposing either a neuroscience minor or major. Either would be formed around a set of core neuroscience courses and a selection of other appropriate courses (e.g. chemistry, health sciences, psychology, and zoology). Electives could be drawn from additional areas (e.g., computer science, philosophy, physics).

Based on this tentative schedule, it is possible that a Neuroscience Minor or Major would be offered for the first time in Fall 2010 or Spring 2011. The course listing for such a program could resemble the following:

### **Required courses**

- ❖ NEUR 2020 Introduction to Neuroscience
- ❖ HTHS/ZOOL 3XXX Clinical/Medical Neuroscience
- ❖ PSYC 3XXX Cognitive and Behavioral Neuroscience
- ❖ HTHS/ZOOL 3XXX Cellular and Molecular Neuroscience
- ❖ NEUR 4010 Neuroscience Laboratory Methods and Techniques

### **Electives**

ANTH LS/DV1020. Biological Anthropology (3)  
ANTH HU/DV1040. Language and Culture (3)  
ANTH SI4300. Anthropological Research Methods (3)  
BTNY 2303. Ethnobotany (3)  
CEET 1110. Basic Electronics (2)  
CEET 1120. Information Technology (2)  
CEET 4040. Digital Signal Processing (4)  
CHEM SI1120. Elementary Organic Bio-Chemistry (5)  
CHEM 1125. Elementary Organic Bio-Chemistry Lab (1)  
CHEM 2310. Organic Chemistry I (5)  
CHEM 2315. Organic Chemistry I Lab (1)  
CHEM 2320. Organic Chemistry II (5)  
CHEM 2325. Organic Chemistry II Lab (1)  
CHEM 2600. Laboratory Safety (1)  
CHEM 3090. Biochemical Techniques (1)  
DMS 4103. Physics & Instrumentation (3)  
HLTH 3100. Applications of Technology in Health Promotion (3)  
HLTH SI4013. Health Promotion Research and Assessment (3)  
HLTH 3160. Health Behavior and Special Populations (3)  
HTHS 1101 Medical Terminology (2)  
HTHS 1110/1111 Biomedical Core Lecture/Lab (8)  
HTHS 2230 Introductory Pathophysiology/Lab (4)  
HTHS 2240/3240 Introduction to Pharmacology (3)  
MICR 3254. Immunology (4) *F*  
MICR 3305. Medical Microbiology (5)  
MICR 4154. Microbial Genetics (4)  
MICR 4252. Cell Culture (2) (*cross-listed with Botany*)

MICR 4554. Virology (4)  
NUCM 4203. Scanning and Imaging Procedures I (3)  
NUCM 4213. Scanning and Imaging Procedures II (3)  
PHIL 3350. Medical ethics (3)  
PSYC 2730. Biopsychology (3)  
PSYC 2830. Psychology of Consciousness (3)  
PSYC 3010. Abnormal Psychology (3)  
PSYC 3710. Physiological Psychology (3)  
PSYC 3730. Perception (3)  
PSYC 3740. Drugs and Behavior (3)  
ZOOL LS1010. Animal Biology (3)  
ZOOL LS1020. Human Biology (3)  
ZOOL 2200. Human Physiology (4)  
ZOOL 3200. Cell Biology (4)  
ZOOL 3300. Genetics (4)  
ZOOL 4050. Comparative Vertebrate Anatomy (4)  
ZOOL 4060. Comparative Physiology (4)  
ZOOL 4120. Histology (4)  
ZOOL 4300. Molecular Genetics (4)  
ZOOL 4350. Animal Behavior (4)

**Supplemental materials supplied herein:**

- Syllabus for the Introduction to Neuroscience course
- Syllabus for the Neuroscience Laboratory Methods and Techniques course
- Funding sources for neuroscience education and research

For additional information, or to be added to the WSU Neuroscience email list, please contact:

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