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Published by the Undergraduate Neuroscience Program
Homewood Campus
Dunning Hall 434
410-516-6196
https://krieger.jhu.edu/neuroscience/bams-program/
The Johns Hopkins University
School of Arts & Sciences
Last updated: Spring 2020

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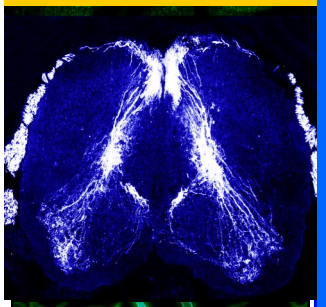
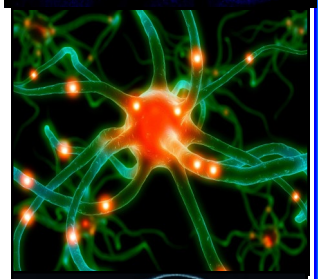
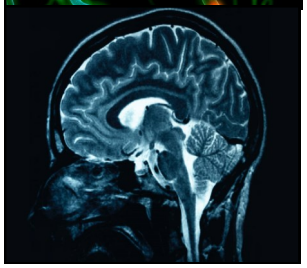
B.S./M.S. Neuroscience







Program Handbook 2019-2020

Offered by the
Interdepartmental Undergraduate

Application Dates: Fall/Spring

Check the website for specific dates.

January/August
Email sent out to all neuroscience majors announcing the timeline and admissions requirements.

February/September
Make an appointment to meet with Dr. Jason Trageser, DUS, and meet with Linda M. White, Program Administrator, about the application packet.

March/October
Application packet due in the Neuroscience Office by 4:00 P.M.

March/October
Applicant Interviews

March/October
Decisions made and applicants notified.

IMPORTANT NOTES

Table of Contents

Introduction

Program Director: Dr. Jay Baraban

Dr. Baraban joined the BS/MS Program in 2011. He is a professor of neuroscience, psychiatry and behavioral sciences at the Johns Hopkins School of Medicine. His research is in understanding key aspects of neuronal plasticity induced by environmental stimuli.

The principal aim of the B.S./M.S. program is to provide an opportunity for students with a serious interest in pursuing research in an M.D., M.D./ Ph.D. or Ph.D. program to work full-time in a laboratory. Students are expected to concentrate fully on their research, attend seminars and journal clubs, and present their research and related topics in both written and oral formats. The B.S./M.S. program is structured to provide students with a genuine and intensive research experience. Students may apply in their junior or senior year if they will complete their BS degree requirements in the fall semester of that year. Students applying in their senior year of full-time study at Johns Hopkins University will receive coverage for 50% of their tuition for their fifth year of study.

B.S./M.S. Commencement Project

The mentored research program culminates in the preparation of a written report on the research project ("thesis"), in the form of a scientific journal article with an expanded introduction and discussion. This report is to be completed following the conclusion of the research year. The first written draft is to be submitted to the research mentor for review. The mentor meets with the student to discuss the content and writing, and requests revisions, if necessary. This process continues until the mentor approves the report.

Student's should then email the final copy to both the Program Administrator and Dr. Baraban. At this point, Linda M. White will then email the student's defense committee with an electronic version of the thesis and remind them of the defense format.

During March of each year (subject to the Graduate Office's deadline), a B.S./ M.S. Project Defense will be scheduled. In most cases, the student will give a 45 minute presentation that will be interrupted by questions from the Committee and guests. The defense is open to anyone who may wish to attend. The written report and oral presentation are evaluated by the Defense Committee. Passing performance, as judged by the Committee, is required for the M.S. degree. Decisions regarding performance are made after each student has finished his/her defense. A student's Defense Committee typically consists of Dr. Jay Baraban, the student's PI and a third committee member that is knowledgeable in the area of the student's research and is chosen by the PI.

Awarding of the M.S. Degree

Students admitted to the B.S./M.S. program will be awarded the M.S. degree when they:

1. Complete all course requirements for the degree.
2. Achieve satisfactory performance, as judged by the Defense Panel on the final written report and oral defense of the research project completed during the research year.
3. Apply for graduation in their last fall semester.

A student who does not receive a satisfactory grade for the B.S./M.S. Commencement Project course and/or does not satisfactorily meet all other degree requirements will not be awarded the M.S. degree, but may, nevertheless, receive a B.S. in Neuroscience, if the requirements for the B.S. have been fulfilled.

Mentored Research (24 credits total)
During the research year, students will complete a total of 24 credits of Mentored Research. Students complete 9 credits of research in the spring academic term, 6 in the summer and an additional 9 in the fall.

Students will register for this course each semester they are in the program.
080.850 Mentored Research: Neuroscience I (spring)
990.892 Mentor Research (summer) **Note:** The Program Office will need to register you for summer research.
080.852 Mentored Research: Neuroscience II (fall)

Final Spring Semester Courses (12 credits total)
Degree requirements include 9 credits of additional advanced neuroscience coursework (300 level or above). Courses must be related to the study of Neuroscience. Students may choose courses from the approved list of undergraduate upper level courses. In addition, students also take the Advanced Seminar in Neuroscience (3 credits).

B.S./M.S. Commencement Project (1 credit)
After completing the research year, students must register for a one credit Commencement Project course devoted to the preparation of the thesis document and their thesis seminar.

Requests for any exceptions to the program requirements must be made to the Neuroscience Program Committee prior to acceptance into the program. Students may not deviate from the degree track once accepted. Failure to comply with all requirements may result in the student's dismissal from the program. Students are required to complete their degree requirements by the end of their 5th year (Spring); otherwise, they will NOT receive their M.S. degree.

Grading of Mentored Research Credits

For each semester's research work, students are assigned a letter grade by the research mentor. The mentor's evaluation takes into account the student's progress on their research project.

Writing Requirement

Writing is an integral part of research. Accordingly, one aim of the mentored research year is to train students in scientific writing. B.S./M.S. students prepare a research proposal for admission to the program, and a final paper ('thesis") in scientific journal article format.

As part of the Advanced Seminar, students are required to write one 5-10 page, review paper, as well as prepare several oral presentations each semester. The paper topics are selected by the student and research mentor. Papers will be submitted to Dr. Jay Baraban, Program Director, for review. In addition, students prepare a progress report on their project due at the end of the summer.

Admissions Information

Eligibility

Admission to the B.S./M.S. program is selective. Undergraduate Neuroscience majors interested in applying must meet the following minimum qualifications:

- **Completion of the Neuroscience B.S. requirements and all undergraduate requirements other than the 120 credit requirement, prior to starting the BS/MS Program.**
- **A minimum cumulative GPA of 3.5 or approval from the Neuroscience Program Committee.**
- **A minimum major GPA of 3.5 (includes ALL core, math & science, and upper level coursework).**

Completing the Full Application:

Submit the following items online at**:**

ApplyYourself—https://app.applyyourself.com/

- Application for Admissions
- Research Proposal (upload as one document)
- Two letters of recommendation
- Notify Linda White when you have completed and submitted your application.

Submit the following materials in–person

- A Student/Mentor Contract.
- An official transcript.

Complete application packets must submitted by:

Fall 2020
Application Due: April 10, 2020
Matriculation: Fall 2020

Spring 2021
Application: October 9, 2020
Matriculation : Spring 2021

The Research Proposal

Note: Please keep in mind that this should be a project that can be completed in 1 year (2 semesters plus the summer). To be considered for admission to the B.S./M.S. program, students, in cooperation with their research mentor, must prepare a proposal detailing the rationale, methods, and timetable for a project to be completed during the research year. The proposal will be evaluated by the Admissions Committee with respect to the quality, feasibility and student's knowledge of the proposed research. The format of the proposal should be as follows (pages are to be double-spaced, unbound and unstapled):

Title	(1 page) Title of research proposal, applicant's name and contact information (address, phone, email), mentor's name and contact information (address, phone, email), date of application.
Abstract	(<200 words) Summarize the proposal.
Scientific Aims	(1 page) Specify the aims of the research project and the experimental approaches planned to achieve them.
Background & Significance	(3 pages) Describe (1) the scientific background and (2) the significance. The scientific background explains the current state of knowledge. The significance section specifies how our knowledge will be advanced if the project is successful.
Preliminary Data	(2-3 pages) If the applicant has already done research relating to the proposed project, what has been accomplished? How does it set the stage for the work to be done? If this is a new project, present background data from the sponsor's laboratory that demonstrate the feasibility of the project.
Experimental Design & Methods	(3 pages) Exactly which experiments will be done? What are the critical methods? Is everything in place to carry out the proposed research? If not, what are the steps required to get to that stage? What difficulties might arise? How will they be dealt with? What is the proposed timetable?
Expected Outcome	(1/2 page) What does the applicant propose to discover or elucidate?
References	APA style

Student/Mentor Contract

Included in the application packet will be a *Student/Mentor Contract*. This form verifies that the Research Mentor approves of the student's research proposal and understands the responsibilities of the Research Mentor in supervising the student's research progress. Finally, the signed contract confirms the Research Mentor's willingness to participate in the panel defense of the student's final project and subsequent granting of the M.S. degree.

Interview

Upon the submission of all required application materials, students will be scheduled to interview with the B.S./M.S. Program Director, Dr. Jay Baraban, as well as one faculty member from the Neuroscience Program Committee with expertise in the student's chosen area of research. Interviews will last approximately one hour and will cover the research proposal, timeline, academic record, and recommendations.

Once all applicants have been interviewed, the admissions committee will meet to review all application materials and determine who will be accepted to the program. Since the B.S./M.S. program has an enrollment cap of ten students, the selection process will be based on the overall excellence of each candidate. Applicants will be notified of the committee's decision in March/October depending on the semester.

M.S. Degree requirements

Students in the B.S./M.S. program must complete all requirements for the B.S. degree in Neuroscience (prior to enrolling the BS/MS program), as well as a total of 43 credits of advanced and specialized courses to complete the M.S. degree. Students may be permitted to take additional course work during the research year only with the written permission of the mentor as outlined in the *Student/Mentor Contract*. The additional requirements for the M.S. degree are as follows:

Advanced Seminar in Neuroscience (6 credits)
The Advanced Seminar in Neuroscience is offered each semester. Students will register for this course each semester they are in the program.
080.411 Advanced Seminar: Neuroscience I (1st spring semester)
080.412 Advanced Seminar: Neuroscience II (2nd fall semester)