

# Neuroscience Graduate Program Internal Review Committee Report

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## I. General Overview

### Program overview:

The Interdepartmental Graduate Program in Neuroscience is the only degree-granting interdepartmental program at the University of Utah. It includes 73 faculty who have research interests in a wide range of fields related to neuroscience, and who are housed in a number of Departments across campus. The Program recruits graduate students and provides them with two years of formal training in basic topics related to neuroscience research. Following the first year, students choose an individual lab to conduct their Ph.D. thesis studies. The Program oversees the preliminary exam for Ph.D. candidacy and provides subsequent opportunities for continued training. The goal of the Neuroscience Program is to train graduate students in the basic neurosciences, teach them to think critically, give effective presentations, write clear and compelling research proposals, and complete a significant body of research. The Neuroscience Program also provides a unique opportunity to bring researchers together from across campus to share their common interest in neuroscience and to combine their abilities for student training. This breadth in participating departments, however, provides both a strength and a potential challenge. Relatively few students are trained compared to the number of participating faculty. This may contribute to a perceived difficulty in recruiting faculty for committee work and teaching since there are few faculty members for whom the Program is a major source of students. In addition, Department chairs vary considerably in their level of support for faculty involvement in the Program.

### Faculty:

The Neuroscience Program includes 41 full professors, 14 Associate Professors, 15 Assistant Professors, and three non-tenure track research faculty members. The faculty members are active in their own Departments as well as other Programs across campus. Many faculty contribute to graduate student recruitment and training in the Neuroscience Program as well as teaching, although more work is needed to properly distribute these responsibilities. Faculty apply for Program membership and are selected based on (1) their conducting research in an area related to the neurosciences, (2) having an active research program, (3) having an appointment in one of the participating departments, and (4) their stated commitment to the goals of the Neuroscience Program. This includes a willingness to participate in attaining those goals, including participating in Departmental activities related to graduate education and attending Neuroscience Program meetings as well as participating in Neuroscience Program journal clubs, research in progress meetings, dissertation committees, and qualifying exam committees.

### Students:

There are 49 graduate students currently enrolled in the Neuroscience Program with an average admission rate of 8-12 students per year. There are indications that the quality of students admitted to the Program has improved in recent years, although more time is needed to see if this is reflected in the number of Ph.D. theses completed and students continuing to succeed in their

future employment. The students we met were positive about the Program, their coursework, and their thesis research projects. The major concerns expressed were a lack of teaching experience (TA) and a desire for a lounge dedicated to Program students, although it was not clear to the reviewers how much the lounge would actually be used by students who are so widely spread across campus. When asked about the student-only journal club that is tied to visiting speakers, the students indicated that participation is uneven and suggested that this course might be strengthened by making it a recognized course with assigned credit and by having some faculty involvement.

#### Curriculum and Programs of Study:

A well-balanced and integrated two-year curriculum has been developed that largely serves the Program students and labs well. This is a notable achievement for an extraordinarily broad program. There are, however, a number of concerns with regard to providing teaching experience, formal training in presentations, qualifying exams, and the absence of an elective course in clinical methodologies. These are elaborated in the recommendations.

#### Program Effectiveness:

Effective procedures are in place to assess student progress and monitor trends in recruiting. Program administrator Tracy Marble coordinates tracking/data collection. Program Directorate has responded to feedback to improve the Program. The absence of procedures to provide students with formal written feedback on their journal club and research presentations is a perceived weakness. For Program students who matriculated in 2004 and 2005, the average time to the award of the Ph.D. degree is less than 4 years. These are encouraging numbers although more time is needed to see if this trend continues. Over the last couple of years, there also seems to have been a decrease in the number of students that leave the Program prior to receiving a degree. The Program is encouraged to closely monitor years to degree and the percentages of students who receive their terminal degree as useful metrics for the overall health of the Program. The vast majority of Program students who graduate compete successfully for academic post-docs, faculty positions and positions in biotech/pharma, indicating the overall quality of the Program and its training efforts.

#### Facilities and Resources:

Support from central funds and the successful award of a T32 training grant currently funds 18 stipends for first and second year Neuroscience Program students. The ongoing success of the Program depends on the continuation of these funding streams. Program members and their trainees take advantage of opportunities provided by their affiliations with a number of Institutes and Centers across campus. A natural connection exists between the Program and the Brain Institute. The Program Director plans extensive future cooperation with the Brain Institute, but expressed important considerations for why the Program should remain distinct from the Institute. The way in which this relationship develops will be important for the future success of both the Brain Institute and the Program.

Ms. Tracy Marble manages the Program from a central office located in the Medical Research and Education Building. Many Program members commented on the outstanding job done by Ms. Marble to manage all aspects of the Program, including website maintenance, newsletter publishing and distribution, student recruiting, retreat planning and organization, and tracking of

student progress. Ms. Marble also manages all aspects of the T32 training program. The Program office has the necessary computer equipment required to conduct Program business in an effective manner.

## **II. Commendations**

1. Since the previous Graduate School review, the Neuroscience Program has continued to establish itself as a successful independent graduate training program.
2. Dr. Mary Lucero is widely regarded as providing outstanding leadership. Similar high praise was widely expressed for the Program Coordinator, Tracy Marble, who single-handedly oversees all day-to-day operations of the Program.
3. The Program promotes collaborative efforts related to neuroscience research on campus, bringing together researchers from both the basic sciences and clinical disciplines.
4. The administration is commended for providing support in the form of student stipends, which has been critically important for the success of the Program, including the award of an NIH Training Grant. Given the success of the Program, the central administration is encouraged to continue funding stipends at a level that allows effective recruiting of the most qualified students.
5. A comprehensive and well-coordinated teaching program has been established for the first two years of graduate studies. This includes in-depth training in writing and in preparing grant proposals, a skill that will help students win support during graduate school and their future careers. Indeed, a number of Neuroscience Program students have been successful at obtaining funding from training grants, NRSAs, and fellowships.
6. The Neuroscience Program has established a close and cooperative interaction with the Brain Institute that has benefitted both parties. This includes participation in Brain Awareness Week, which provides an ideal opportunity for outreach to the local community and the recruitment of minority students to careers in scientific teaching and research.
7. Graduate students who have left the Program have been successful in their future endeavors, with many going on to establish independent scientific careers.

## **III. Recommendations**

### 1. Teaching Requirement

One of the four recommendations from the last review was to provide graduate students with opportunities for teaching. Of the five students we met, however, four wanted some exposure to teaching but had not found an opportunity to do so. We recommend including a teaching requirement for all students who graduate from the Program. The Program may need to be creative in devising high-quality teaching opportunities for its ~10 students per year. One possibility is that first year Neuroscience Program courses might benefit from the inclusion of

discussion groups that would allow teaching assistants to review topics covered in the lectures and expand those topics in new directions.

## 2. Faculty Teaching & Service

It was stated repeatedly during the review that it can be challenging to recruit faculty participation for committee work and teaching. One possible approach to solve this problem might be to establish a formalized procedure for the replacement of faculty in administrative and teaching positions. The Program should consider implementing a three-year limit for faculty service on Program committees. Replacements for these positions could be set up by asking faculty to sign up for these appointments several years in advance. Faculty who are not inclined to serve on a committee in the current year could be more easily encouraged to sign up for a future date, and then held to that commitment. A similar effort could be used to sign up faculty for teaching in the core courses. In addition, faculty are only asked once, at the beginning of their appointment to the Program, which committees and teaching they would like to contribute to. This contact should be continued at regular intervals during their membership in the Program.

## 3. Formalized Training in Graduate Student Presentations

Graduate students in the Neuroscience Program speak at least three times during the course of their training in at least one of three activities: the Annual Student Retreat, the Student Symposium, and the Snowbird retreat. Further training in oral presentations is assumed to take place in their home departments. Most participating Departments, however, do not offer speaking opportunities to Program students. The Neuroscience Program should institute a regular opportunity for formal student presentations, with an organized effort to provide detailed feedback on the talk. This also has the advantage of gathering Program faculty during the later years of graduate study for the purpose of continued formal training.

## 4. Qualifying Exams

The Ph.D. qualifying exams would benefit from a careful consideration of how they are organized and implemented. There are three specific recommendations.

(a). The mechanism for selecting the exam topic should be more clearly defined. As currently stated, “the Supervisory Committee may request the student to make a list of preferred topics, provide a series of short abstracts, or may choose the topic ab initio.”

(b) The Program should eliminate the potential conflict of interest in having the student advisor participate in the qualifying exam. The current Neuroscience Program guidelines stipulate that the Advisor can be appointed as Chair of the qualifying exam and play a central role in how the exam is administered. The Neuroscience Program should consider following the guidelines implemented by the Departments that participate in the Molecular Biology and Biological Chemistry Programs. These stipulate that, while the advisor may attend the qualifying exam, they cannot participate in any way. This provides a more balanced opportunity to evaluate the student for their advancement to Ph.D. candidacy.

(c) Although Tracy Marble tracks each student and makes sure that they complete the exam during their second year, the Program website states that this does not need to be done until the fall semester of the third year. This should be corrected and the deadline clearly stated.

## 5. Add a Recruitment Committee

Recruitment is currently the purview of the admissions committee. The Neuroscience Program should consider implementing a formal Recruitment Committee to help with recruiting regular students and minority students. More coordination with the recruiting efforts of the Molecular Biology and Biological Chemistry Programs could help with these efforts.

6. Consider instituting a half semester elective lecture course for clinical research

The current courses do not provide the necessary background for graduate students to start their thesis research in a clinical lab. This would have the most impact if offered during the summer after the first year or the beginning of the second year. It is not clear how widespread this need is felt among Program faculty, but it was expressed strongly and should be considered further.

7. Consider increasing the class size

Given the large size of the faculty and their strong level of overall funding, it would be appropriate to increase the incoming class size to a target of 12-15 students per year. Due to the success in securing a training grant, this might be achieved without an increase in financial support from the central administration. Note that it would be inappropriate for the current level of central support to be reduced, since this would be viewed as punishing the Program for their success in obtaining the training grant. It is also important to note that quality is more important than quantity, and numbers should only be increased to the extent that incoming student quality can be maintained.