

## ARTICLE

# Northeast Under/graduate Research Organization for Neuroscience (NEURON): Our Thirteenth Conference for Neuroscience Trainees and Educators

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The Northeast Under/Graduate Research Organization for Neuroscience (NEURON) was established 12 years ago in order to foster the training, education, and research of both undergraduate and graduate neuroscience students. NEURON hosts two annual conferences (Boston in the fall; New York City in the spring) to promote and support neuroscience training, education, and research. For 12 years, the organization has promoted neuroscience by exposing neuroscience trainees to research and educational perspectives (Edinger et al., 2004, 2005; Frye

and Edinger, 2004; Goyette et al., 2008; Rhodes et al., 2006, 2007, 2008). Conferences are supported by an NIH R13 grant, and serve as a valuable experience for both students and mentors with a passion for neuroscience. This paper describes the proceedings of the fall 2007 meeting at Northeastern University.

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The Northeast Under/graduate Research Organization for Neuroscience (NEURON) is an organization, which works to enhance the training, education, and research opportunities for students by sponsoring conferences. At a Neuroscience Education Training Conference, supported by The New England Consortium of Undergraduate Science Education (held at Trinity College in 1995), Drs. Cheryl Frye (University at Albany-SUNY), Priscilla Kehoe (Trinity College), and Cheryl McCormick (Bates College) realized the importance of exposing neuroscience trainees, especially undergraduates, to broader research and educational perspectives than typically occurs in training environments at small liberal arts colleges. NEURON was created to bring together trainees and faculty from colleges and universities throughout the northeast to better address this need. Thus, since 1996, NEURON has created a vehicle for undergraduate and graduate students to present their research, discuss it with leaders in the field, and learn from these individuals at a more advanced level than what is offered in basic curriculums (Edinger et al., 2004, 2005; Frye and Edinger, 2004; Goyette et al., 2008; Rhodes et al., 2006, 2007, 2008). Two NEURON conferences are held annually: New York City in the spring and Boston in the fall. Both meetings are supported by an NIH R13 grant and serve as a valuable experience for both students and mentors with a passion neuroscience.

This paper describes the proceedings of the fall 2007 meeting at Northeastern University. The main activity, a morning poster session, provided a forum for students to present, discuss, and gain feedback on their current research. Other professional development issues were covered in roundtables, workshops, and discussion groups.

**Registration:** In order to have a successful meeting, and to attract greater diversity, it was necessary to reach out and advertise to the desired constituency. The meeting was advertised by pamphlets distributed to high schools, colleges, and universities that have trainees or students interested in the study of neuroscience. Notice of the meeting was also distributed to potential participants via list serves. Lastly, information was available via the NEURON website (<http://www.albany.edu/neuron/conference/index/html>).

To adequately serve the participants, attention to logistics, such as adequate space, materials, and refreshments were necessary. We were fortunate to have funding from NIH (R13) to support these aspects of the conference, which enables participants to attend without costs to themselves. However, we needed to know how many attendees there would be in advance to effectively meet the needs of the participants, and to make the conference a success. Moreover, the integrity of the science requires that we received advance commitment from participants, so that we were able to create and disseminate an appropriate program. As such, we asked that participants pre-registered via the NEURON website. When participants pre-registered on the website, we inquired if they wished to make a presentation during the poster session. In addition, pre-registered participants were asked to complete a pre-conference survey. From this survey, we were able to collect and analyze pre-conference participant demographic data. Moreover, the online pre-registration allowed us to gauge the size of the conference; and in turn, effectively serve the participants in terms of conference logistics.

The day of the conference, pre-registrants checked-in

Gender	Count	Ethnicity	Count	Academic Status	Count
Male	41(32)	Caucasian	63(51)	High School	2 (1)
Female	88(68)	African-American	7 (6)	Undergraduate	86(67)
		Latino/Hispanic	24(20)	Graduate	27(21)
		Asian/Pacific Islander	19(15)	Faculty	14(11)
		Other	10 (8)		
<b>Total</b>	<b>129</b>		<b>123</b>		<b>129</b>

Table 1. Attendance Statistics from Survey. Numbers in ( ) indicate percentages

and verified their information. Individuals that were not pre-registered had the opportunity to do so on site. In order to meet our goal of increasing participants and diversity at the conference, we have recognized the importance of flexibility in planning activities, and offer numerous opportunities for conference attendees. Each participant was given a folder that had the conference program, handouts for each workshop, as well as information about neuroscience job and educational opportunities. Registrants were provided information about meeting evaluations and were directed to go for the poster session or the “Brain Primer” workshop.

For the current meeting, there were 355 total registrants: 217 (61 %) undergraduates, 57 (16%) graduate students, 14 high school students (4%) and 67 (19%) faculty members. At the end of the meeting, attendees were requested to fill-out a survey regarding their experience. Respondents rated the various features of the meeting, such as workshops and the keynote address on a 3-point Likert scale (1, not useful; 2, somewhat useful; 3, very useful). According to the survey, women comprised 68% of attendees and approximately 50% represented under-represented minorities (see Table 1).

**Poster Session:** To be an effective professional development experience for neuroscience trainees, all participants are given the opportunity to present the research they have been working on. A unique and key aspect of the conference is that students have the opportunity to not only present their research but to do so in a non-threatening environment. In holding the poster sessions, our goal is to foster the overall development of trainees, allowing them to not only present their research, but to gain valuable professional development experience. The poster session immediately follows the morning registration, and is the first meeting during the conference. Breakfast is also available concurrent with the poster session to create a more welcoming atmosphere. In order to create opportunity for all participants that wish to present during the poster session, it lasts for a total of three hours. Students presented their posters one-on-one to mentors, faculty members, and fellow trainees. The session was formatted this way, so that students are able learn how to effectively communicate their research and develop relationships with other neuroscientists. In holding the poster sessions, we aimed to continue our mission to foster

the development of neuroscience trainees and provide them with opportunities to interact with other trainees and professionals. This experience also gives participants the opportunity to learn about new techniques and areas of research in neuroscience that they may not have been exposed to prior to the conference.

During this meeting, there were 44 poster presentations given by both graduate and undergraduate students during session with 222 in attendance. According to the survey, 67% of attendants rated the poster session as “very useful.” Furthermore, 61% of undergraduates surveyed indicated that this was their first scientific conference and 49% reported that this was their first poster presentation.

**“Brain Primer” Workshop:** The “Brain Primer” workshop was created to reach out to younger people that are interested in neuroscience, but that have little background. Many science students are fascinated with the brain, yet know little about it. This workshop reaches out in particular to high school students, because neuroscience is not currently integrated into high school curriculums. The “Brain Primer” was held in the morning immediately following registration and was held concurrent with the poster sessions. The workshop introduced the attendees to the world of neuroscience by describing recent exciting breakthroughs in the field. Moreover, participants learned how to successfully navigate the conference and get the most out of their experience. Most importantly, the workshop was created so that engaged high school students could learn and discuss neuroscience at a more advanced level than traditionally available in the high school. The literature indicates that as students become more involved, they are more likely to enhance their educational experience and become more engaged in their program (Hardwick, 2005; Lopatto, 2007). Indeed, sixty percent of attendees rated this workshop as “highly beneficial.” We are now piloting a similar mentoring program for other NEURON conferences as a means to increase the exposure of high school students to neuroscience.

**Docent Program:** At first, a neuroscience conference can be quite intimidating for a high school student. In order for high school students to effectively navigate the conference and take advantage of the advanced level of science, we have created a docent program. Immediately following the

“Brain Primer” workshop, high school students were paired with a graduate docent. The docent led students around the poster sessions, translating the higher level information to a more basic level that a young neuroscientist could understand. This provided an opportunity to empower high school students, allowing them to more fully participate. The docent program was led by Angela Seliga (Boston University). The overall aim of the program was to enhance the experience of the younger students, while engaging them in neuroscience. Moreover, as it is important to introduce students to neuroscience while they are still in high school, it is equally important to provide opportunities for all participants to be actively engaged in the conference through activities such as the docent program.

**Keynote Address:** At each conference, a distinguished neuroscientist is invited to deliver a keynote address to the conference participants. This year, Dr. William Carlezon of Harvard Medical School, McLean Hospital was selected as the keynote speakers for both his interesting research endeavors and his willingness to work directly with students to develop their interests in neuroscience. Dr. Carlezon discussed the “Role of nucleus accumbens CREB in motivated behavior: implication for co-morbidity of addiction and depression.” A highlight of Dr. Carlezon talk was a You-Tube.com video that examined *Salvinorin A*, a powerful psychoactive drug, through the lens of popular culture that left students intrigued and engaged. Indeed, many students left the discussion to go view the video again, or engaged in subsequent conversations with fellow-trainees. Following the talk, many students stayed afterward to talk to Dr. Carlezon individually to ask more in-depth questions. Prior to his talk, Dr. Carlezon attended the student poster sessions, interacting one-on-one with students, providing them with feedback on their original research projects and presentations.

**Tieman Awards for Trainees/Faculty:** It is important to recognize achievements of neuroscientist trainees. A key element of the environment created by NEURON is to encourage participants to present their research to peers and professionals in the field. Over the years, we have continued to encourage presentations and we have created an award to recognize extraordinary research efforts by trainees. Awards for student poster presentations were handed out following the keynote address. The Suzannah Bliss Tieman Research Award was created to honor Suzannah Bliss Tieman. She was an invaluable member of the NEURON Steering Committee and played a formative role in the development of the organization. She passed away recently, and in her memory, an award to recognize extraordinary trainees was established.

Former students and colleagues of Dr. Su Tieman, other members of the NEURON Steering and/or Local Organizing Committee, and former recipients of the award judge presentations. Research awards are given to students who exhibit high quality presentations of their projects. The criteria used to judge student presentations

are those that Dr. Tieman valued most: format and organization of the presentation; use of color, font, figures, pictures; clear, succinct methodology; ability to thoughtfully answer questions; enthusiasm about the project. This year, Kassandra O’Brien (Northeastern University) received the undergraduate award for her presentation, “Alteration in Dopamine and Dopamine D2 Receptors Correlates with Adolescent, Anabolic Androgenic Steroid Treated Hamsters;” Angela Seliga (Boston University) received the graduate award for “Mating Induces Phosphorylation and Nuclear Translocation Of Mitogen-Activated Protein Kinase (pMAPK) in Female Rats.”

Not only is it important to recognize achievements of trainees but it is important to recognize extraordinary faculty members that have an important role in the development of young neuroscientists. To recognize the extraordinary efforts of faculty members that take time to work one-on-one with students to foster their development into future extraordinary scientists, the Suzannah Bliss Tieman Exemplary Mentorship Award was created. This award is handed out in conjunction with the Tieman Award for trainees and is given to one faculty member at each conference. Dr. Sharon Ramos-Goyette (Stonehill College) was presented this year’s award for her contribution, A Panel Discussion of Neuroscience Outreach and Opportunities.

**Outreach Workshop:** Workshops held after the keynote address, catered to the diversity of the participants at the conference. For high school students that wish to continue to engage in neuroscience following the conference, and undergraduate students uncertain if they wish to continue on to graduate training, a panel was organized to discuss research and educational opportunities for trainees in the Boston area. A graduate student at Boston University, Angela Seliga and Dr. Sharon Ramos Goyette (Stonehill College), led the panel and discussed what opportunities were available for trainees. The panel was designed particularly to inform high school trainees that they have the option to continue to be engaged in neuroscience following the conference. Moreover, taking advantage of opportunities that are highlighted will help trainees to form concrete professional contacts that will help with educational and training guidance for interested students. Students that take advantage of the highlighted opportunities will be able to continue to foster their growth as young neuroscientist and thrive in the field as they advance their education. NEURON continually recognizes the importance of nurturing young neuroscientists through opportunities such as this panel discussion. Participants were able to interact with a current graduate student and a faculty member which, in turn, would guide them through possible paths of professional development.

**Graduate School Workshop:** To plan an effective conference for undergraduate participants, it is important to have workshops that will help them to develop as trainees, as well as instructing them how to further their neuroscience training. A continuing successful feature of the conferences are the workshops held for participants to

attend. Drs. Madeline Rhodes of Smith College with the assistance of Jay McLaughlin of Northeastern University led the workshop, "How to gain entrée and thrive in your graduate program of choice." The workshop discussed general preparation for a graduate career including research interests and career goals, grades, and research experience. Participants also learned about how to find a school that matches their interests, the application processes, admission tests, letters of recommendation, and how to properly write a personal essay.

### **Summary**

One of the primary objectives of NEURON is to provide an open forum for neuroscience undergraduate and graduate students to present and discuss their work with to provide an open forum for neuroscience undergraduate and graduate students to present and discuss their work with students and faculty of similar interests. Previous research demonstrates that presenting research at a conference poster session serves as an effective vehicle to meet this objective (Allen and Tanner, 2005). Indeed, as noted earlier the majority of students rated the poster session as "very useful." Moreover, the entire organization of the NEURON meeting including the keynote speaker, the workshops and the poster session is designed to maximize, to promote and encourage the development of neuroscientists in training.

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