

ARTICLE

Expanding Collaborations between the Neuroscience Training Committee of the Society for Neuroscience and the Faculty for Undergraduate Neuroscience

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At the FUN workshop at Dominican University in July 2017, we presented a session on activities of the Neuroscience Training Committee (NTC) of the Society for Neuroscience (SfN). We focused on activities that pertain to undergraduate neuroscience education and how NTC could help the Faculty for Undergraduate Neuroscience (FUN) achieve its goals and objectives in the coming years. We outlined a brief history of how FUN became involved with the Association of Neuroscience Departments and Programs, one of the parent organizations from which the current NTC evolved. We provided examples of the efforts that the NTC is making to include more activities that support undergraduate neuroscience education, including providing support for FUN workshops and its accompanying special issue in the *Journal of Undergraduate Neuroscience Education (JUNE)*. In addition, we solicited feedback from the participants at this session for ideas for how the NTC could better serve members of FUN. This discussion yielded

questions about the value of Institutional Program (IP) memberships for undergraduate institutions and suggestions, such as reduced membership fees and discounts for abstracts, and/or registration attendance at the annual SfN conference for individuals at colleges or universities with IP membership. Other suggestions included providing short courses in undergraduate pedagogy (including program and curriculum development), sponsorships for developing new assessment tools or innovative curricula, and providing more support for *JUNE*. We concluded our session by encouraging FUN members to become active in NTC programs and to seek membership to the NTC and other SfN committees to ensure that the voice of undergraduate neuroscience education will continue to be heard.

Key words: Neuroscience Training Committee (NTC); Institutional Program (IP) membership; undergraduate neuroscience pedagogy; graduate school fairs; webinars on issues in undergraduate education; NTC survey.

The Neuroscience Training Committee (NTC) of the Society for Neuroscience (SfN) helped sponsor the 2017 FUN workshop at Dominican University, as well as this special issue of the *Journal of Undergraduate Neuroscience Education (JUNE)* describing workshop presentations. NTC's financial assistance is a continuation of its investment in FUN; the committee also helped sponsor the 2015 FUN workshop at Ithaca College. As part of the Dominican workshop, we presented a plenary lecture/discussion section on the partnership between the NTC and FUN. Our presentation covered: (1) a brief background of how the NTC-FUN partnership evolved; (2) how the NTC-FUN partnership has helped both organizations achieve their missions; and (3) ways in which the NTC-FUN partnership could be expanded and enhanced.

HISTORY OF FUN AND THE EVOLUTION OF THE FUN-NTC PARTNERSHIP

In 1991, Julio Ramirez, Sally Frutiger, Stephen George, and Dennison Smith (the original FUN Executive Committee) organized a meeting to discuss establishing an organization for faculty whose primary focus was on undergraduate neuroscience education (Ramirez and Normansell, 2003). Although the number of faculty who showed up at the first meeting was not huge, the enthusiasm for the idea was. It was clear that this new

organization could fill a niche for the emerging population of faculty teaching neuroscience. At that time, the focus of the SfN was on research, and the major contributions to neuroscience education were provided by the Association of Neuroscience Departments and Programs (ANDP), whose focus was on education of graduate and medical students. As such, there was no voice for those devoted to teaching undergraduate neuroscience. There was not even an opportunity for undergraduates to sponsor their own research at the SfN meetings. Clearly, the time for an organization devoted to undergraduate education had arrived, and of the various names proposed for the organization, Jeff Wilson's suggestion sounded like the most "fun." The ideas of establishing travel awards for faculty and students, teaching awards, a newsletter, and workshops were exciting possibilities enthusiastically embraced by the new organization (Ramirez and Normansell, 2003). The mission of FUN included providing "undergraduates with greater access to the national SfN meeting and advancing undergraduate neuroscience faculty development" (Wiertelak et al., 2011).

In 1992, Ramirez invited SfN President, Joseph Coyle, and ANDP President, James Blankenship to the second annual FUN social at the SfN meeting. That same year, Ramirez, Smith, and Gary Dunbar (who was added to the Executive Committee) met with the SfN Education Committee and invited them to partner with FUN to promote undergraduate neuroscience education (Ramirez

et al.,1998; Ramirez and Normansell, 2003). The following year, the ANDP invited FUN representatives to present a symposium on undergraduate neuroscience education at their annual meeting, which led to a new partnership between FUN and ANDP, and included several initiatives, such as coordinating an undergraduate component to ANDP's *Neuroscience Training Programs of North America*. This partnership was very helpful to FUN by increasing its awareness and mission, and it also helped the ANDP expand their outreach. From 1994 to 2008 the partnership grew and the ANDP established a liaison membership for FUN and sponsored more symposia for FUN members, including the presentation of the results of a survey on undergraduate neuroscience education by Jeff Wilson (Hardwick et al., 2006).

By 2008, the ANDP formally merged with SfN to become the Committee for Neuroscience Departments and Programs (cNDP), but maintained the liaison membership for FUN, which was strengthened by the election of other FUN members to the cNDP. Between 2012 and 2014, nearly 25% of the cNDP membership also had strong ties to FUN, as the terms of Bruce Johnson, Jean Hardwick, Barbara Lom, Julio Ramirez, and Eric Wiertelak overlapped. However, by September of 2015, SfN expanded the mission of the cNDP and changed its name to Neuroscience Training Committee (NTC). The new committee structure included a continuation of the liaison membership for FUN, which is currently occupied by Dunbar through the 2018 annual SfN meeting and also included Laura Symonds and Keith Trujillo as members selected by the Committee on Committees of the SfN to serve as appointed members of the NTC.

ACTIVITIES OF THE NTC-FUN PARTNERSHIP

The NTC was established to expand training throughout the career of the neuroscientist and to meet new demands in the field, such as increasing scientific rigor and developing and teaching new methods. In addition, the NTC is concerned with workforce policy issues, such as engaging with agencies on training policies, as well as supporting institutional program (IP) memberships, by training the trainers and providing teaching resources (see Fig. 1 for description of the core functions of the NTC).

One of the many NTC-sponsored activities that directly impacts undergraduates is the graduate school recruiting fair at the annual SfN meeting. This event allows undergraduates who attend the meeting to talk with representatives from national and international neuroscience graduate programs. Students gain insights into what different qualifications graduate programs are looking for in applications. They discover what research areas are emphasized in the various programs, gain valuable contact information, and they can learn about the levels of support from the nearly 100 graduate schools represented at the fair each year (Fig. 2).

Another valuable service that the NTC provides is the excellent library of teaching tools, many of which are appropriate for undergraduate neuroscience education and in which many FUN members are involved. These include

Core Function	Primary Activity
Neuroscience Education (trainee period)	<ul style="list-style-type: none"> • Preparing students during trainee period • Sharing best practices, resources, priorities, challenges • Fostering careers in academia and beyond
Life-Long Learning (scientific training for all career stages)	<ul style="list-style-type: none"> • Emerging tools and techniques • Short Courses, Meet the Experts, new programming TBD • Scientific rigor
Workforce Policy	<ul style="list-style-type: none"> • Engagement with agencies re: policies and implications of training policies • International collaboration, where appropriate
Supporting IP Members via NDP subcommittee	<ul style="list-style-type: none"> • Integration of above into NDP community; conduit of NDP perspectives into above • Training the trainers programming (AM and year-round) • Teaching resources • Networking and discussion

Figure 1. Core functions of the NTC.



Figure 2. NTC-sponsored graduate school fair at the annual SfN meetings is utilized by many undergraduates each year. Last year there were nearly 100 graduate programs who took part in this event.

webinars, training modules, videos, and podcasts. For example, several teaching tips directed to undergraduate programs (Fig. 3) can be found at neuroonline.sfn.org. SfN members and individuals associated with a program with an IP membership have unlimited access to Neuroonline. For those without SfN or IP membership, access to Neuroonline is limited to five resources a month.

Perhaps the most direct support that NTC provides to FUN is its sponsorships of our workshops at Ithaca College in 2015 and Dominican University in 2017. At the 2015 workshop, the then-NTC Chairperson, Hermes Yeh, took



Audrey Chen discusses The Claremont College's 5-C Summer Undergraduate Research Program.



Leah Anderson Roesch's neuroscience class is not just a prerequisite course for her non-neuroscience students. It's a way to get liberal arts students excited about the field.

Figure 3. Examples of NTC-sponsored webinars and training modules (from: <http://neuronline.sfn.org/>).

part in a best practices plenary lecture. For the 2017 workshop, the NTC supported Laura Symonds to describe the NTC-FUN partnership. In both cases, the NTC offered funds to help publish the proceedings from these workshops. In addition, the NTC sponsored a webinar on May 30, 2018 on neuroscience pedagogy featuring FUN member presentations: Julio Ramirez (establishing and running a neuroscience minor at a liberal arts college), Karen Parfitt (establishing and running a neuroscience major at a liberal arts college), Gary Dunbar (describing a neuroscience major at an R2 university), and Laura Symonds (describing a neuroscience major at an R1

Figure 4. Example of data collected by the latest NTC survey, showing the types of courses covered by undergraduate neuroscience programs (source: <http://www.sfn.org/Careers-and-Training/Faculty-and-Curriculum-Tools/Training-Program-Surveys>).

university). This webinar is available online at <http://neuronline.sfn.org/articles/program-development/2018/undergraduate-neuroscience-pedagogy-perspectives-from-different-institutions>.

NTC is currently seeking help from the FUN membership to prepare and conduct a new survey focused on undergraduate neuroscience programs. While the most recent NTC survey (2016) provided some interesting information, such as the frequency with which certain types of courses are offered or required in undergraduate programs (Fig. 4), it had several weaknesses. For example, the survey includes responses from only 22 undergraduate programs (with many questions being answered by far fewer than 22), so it is unlikely to provide an accurate view of what is occurring at most schools. As such, NTC hopes to partner with FUN to bolster the input of the next survey or may ask FUN to share with the NTC the data of its own survey.

The NTC is interested in having FUN conduct a survey of undergraduate programs that would reflect more accurately the demographics and structures of current undergraduate programs, as well as incorporating new questions in such a survey that would be most helpful to the institutions involved in undergraduate education. The NTC is interested in knowing what undergraduate programs would like from the NTC and whether this might increase IP memberships among undergraduate programs. Some insights for this were provided in the lively discussion towards the end of our presentation, which included suggestions that would make NTC and SfN resources more readily available to the broader undergraduate community (see below). Clearly, a major involvement by FUN in such a survey would mutually benefit both organizations.

ENHANCING THE NTC-FUN PARTNERSHIP

The last part of our FUN workshop presentation focused on how the NTC-FUN partnership might be strengthened. We

US Undergraduate Course Requirements

	Required Coursework	Elective Courses	Informal Coursework	Not Covered
Writing	78%	50%	11%	0%
Statistical reasoning and data analysis methods	78%	39%	0%	6%
Lab or method-based courses	78%	39%	0%	0%
Experimental design	72%	50%	6%	0%
Scientific rigor issues	72%	50%	6%	0%
Public speaking	67%	39%	17%	11%
Responsible conduct of research	56%	22%	28%	0%
Ethics	50%	33%	11%	11%
Grant writing	28%	33%	17%	28%
Computer programming	28%	50%	6%	17%
Science outreach and advocacy	11%	33%	39%	17%
Data science/ "Big data" approaches	6%	56%	22%	22%
Journal clubs	0%	44%	39%	17%

Question: "In addition to your technical neuroscience content, how does your program provide training in the following topics? Select all that apply."

Please note the table uses a color gradient to highlight differences within each column. Green cells are the highest in that column, yellow are in the middle, and red are the lowest percentages in that column.

asked members of the audience for their ideas and received many suggestions. These included increasing the value of IP memberships for undergraduate institutions and providing more support for specialized programs that promote undergraduate education, as well as promoting and supporting *JUNE*, the flagship publication of FUN devoted to undergraduate neuroscience pedagogy (Lom, 2002; Dunbar et al., 2009).

To add value to IP membership, it was suggested that the NTC offer access to Neuroline for undergraduates as a part of the IP membership, especially since many of these students cannot afford individual SfN memberships. It was also suggested that the cost of individual SfN memberships and SfN meeting registration could be discounted for faculty and students at institutions with IP memberships. It was pointed out that even FUN Travel Award winners are required to pay the entire annual meeting registration fee, which leaves little, if any of this award to be used for their actual travel expenses.

It was commented that faculty members who have paid the individual SfN membership fee are, nonetheless, prevented from serving on the NTC unless their college or university is also an IP member. Although this may be an incentive to obtain an IP membership, it does reflect an additional hardship for faculty at smaller schools where the IP fees cannot be justified if there are only a few neuroscience faculty members. This becomes a hard sell to their administrators, who often require strong cases for direct, tangible benefits for their students before allocating funds for such purposes.

In terms of specialized programs for undergraduate neuroscience education, a suggestion that NTC provide a short course on undergraduate pedagogy at the SfN meeting, or as a satellite meeting, was made. Other suggestions included that the NTC sponsor grants for developing assessments and innovative curricula. It was also recommended that efforts be made to offer the undergraduate poster session at a better location and time during the SfN meeting. Finally, it was suggested that increasing and highlighting the special programs for undergraduate neuroscience education could use the models provided by the American Psychological Association and the American Physiological Society and which are prominently displayed on their websites. Such resources as research and writing tips, information on how to engage in community service, and topics like curriculum, faculty development, and diversity that are geared specifically for undergraduate pedagogy are offered and are easier to access on these professional organization sites than can be found on the SfN site.

There was some discussion about support for scholarship and tools related to undergraduate pedagogy in the neurosciences, such as support for ERIN (Educational Resources in Neuroscience). We indicated that support for ERIN has been discussed and considered by the NTC, but that, presently, it is unclear if NTC has the resources to update and fix broken links in the current ERIN online portal.

We concluded our session with an appeal to all FUN

members to engage with the activities offered by the NTC and the SfN. We also asked FUN members to seek membership on the NTC and other SfN committees. Only through active involvement with the NTC and SfN can the voice of undergraduate neuroscience education be heard and incorporated as part of the intertwined missions of the NTC and FUN.

CONCLUSIONS

Overall, our session on expanding the NTC-FUN partnership engendered a great deal of interest and audience participation. Participants expressed their appreciation for the efforts that the NTC is providing to extend its outreach to include more of what is most pertinent to undergraduate programs, such as an increase in undergraduate-specific content on Neuroline. In addition, the session provided constructive insights into ways in which the NTC-FUN partnership can be enhanced. The support of the NTC in sponsoring the Dominican workshop session and for helping *JUNE* publicize the proceedings of all the workshop sessions is greatly appreciated. We are hopeful that the NTC-FUN partnership can continue to grow and flourish well into the future.

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