

Feature

Strategy for Engaging the Society for Neuroscience in Science Education

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INTRODUCTION

The Society for Neuroscience (SfN) has more than 37,000 members and constitutes one of the largest single-theme scientific societies in the United States. Although many of its members are engaged in various activities that support their local science education programs, historically the society has not played a major role in shaping the national debate on science education. This posture changed with the adoption of a Strategic Plan in 2003 and revision in 2006 that defined a global mission and vision for the organization (SfN, 2003) and its role in public education. The goals aligned with science education were taken up by the Committee on Neuroscience Literacy (CNL), which has recently merged with the Public Information Committee to become the Public Education and Communication Committee.

To focus the committee's charge associated with the Strategic Plan, the CNL met in early 2005 to revise its mission statement and to establish priorities for public education programs over the next decade. The CNL seeks to increase the level of public awareness and education efforts in the neurosciences. The Committee aims to

- increase the level of neuroscience literacy in the public;
- increase the number of neuroscientists properly trained and engaged in public communications, outreach, and advocacy;
- increase the number and depth of neuroscientist/teacher partnerships;
- emphasize neuroscience in the K–12 school curricula and in teacher professional development; and
- enhance the stature and visibility of neuroscience/science education within the society and academic community.

From these aims, two major focus areas emerge. The first focus relates to preparing neuroscientists for public interactions that are educational in scope, and the second focus relates to optimizing the impact of our programs for the science education community.

Focus area 1 involves catalyzing a shift in the professional culture of SfN members to include and embrace public

communications, outreach, and education about neuroscience.

Focus area 2 involves fundamentally shifting SfN's K–12 education activities in two ways: 1) Invest in broader, national education efforts aimed at the shared agenda of improving science education, thus increasing the national readiness for science research, leadership, and innovation; and 2) move SfN's education efforts to venues that are more accessible by teachers.

These foci generated by the CNL have been embraced by the society leadership and have been incorporated into the current Strategic Plan approved in early 2006. In particular, the Society has articulated renewed importance for communicating the results and benefits of biomedical research to the general public and to educators as a step toward ensuring public awareness and use of the knowledge gained as well as an electorate that is supportive of the research endeavor.

SHIFTING THE PROFESSIONAL CULTURE OF SfN MEMBERSHIP

Currently, only a small proportion of the membership elects to become actively engaged in communicating the importance of their research findings or basic information about neuroscience to the general public. It is unclear whether the lack of stewardship, or activities aimed at "civic science," is due to limited incentives for engaging in this work or to a less than adequate emphasis on public outreach and education in training programs. This systemic deficiency in the training of our graduate students is being addressed by the Carnegie Initiative on the Doctorate in which neurosciences is one of six disciplines that are participating (The Carnegie Foundation for the Advancement of Teaching, 2006a). Fifteen departments and programs in the neurosciences are involved with this project from across the United States. Three areas were identified as critical for effective "stewardship of the discipline"—generation, conservation, and transformation. It is in this latter category, transformation, that the importance of developing skills to "communicate in oral and written forms to technical and lay audiences" is underscored. "Whether working in a classroom, nonprofit or governmental organization, industrial setting, or policy arena, a steward must be able to convey information and the value of their knowledge and skills" (Carnegie Foundation for the Advancement of Teaching, 2006b).

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Depending on where a neuroscientist receives training, he or she may or may not have received formal training in the art of teaching (pedagogy) and only rarely in public speaking. Universal to all research training environments is the development of skills to critically evaluate the scientific literature and to exchange ideas with peers. This kind of training falls short in equipping neuroscientists with the necessary tools to become effective communicators when addressing an audience other than their peers. Recognizing this shortcoming, SfN and other institutions have sponsored professional development workshops at the SfN annual meeting that specifically target graduate students and postdoctoral fellows and that help them develop specific communication skills (Zigmond and Fischer, 2006).

There is a great need for scientists to communicate with nontechnical audiences. To address this need, the CNL is exploring the development of a training module on communicating with the public that will supplement existing professional development programs such as the University of Pittsburgh's Survival Skills and Ethics program. In the revised Strategic Plan, the society has committed to assessing member needs and crafting a professional development plan to better address those needs. This assessment will explore opportunities for the exchange of information and training beyond the annual meeting, with a focus on training and support for mentors, science educators, and others.

Few rewards exist in the current academic research environment for scientists to engage the public in dialogue about the exciting discoveries in neuroscience research. However, that does not lessen the need to relate these compelling stories regarding the impact of advances in the neurosciences on everyday life. These efforts are critical to our goal of developing a well-informed electorate that can see the impact and recognize the value of neuroscience research. In general, neuroscientists have not been quick to embrace this responsibility to communicate directly with the public.

One success in mobilizing the society membership to engage in public dialogue has been Brain Awareness Week (SfN, 2006a). This campaign was developed through a strong partnership with the Dana Alliance for Brain Initiatives (Dana Foundation, 2006) and serves as an exemplar for other scientific societies. As this campaign moves into its second decade, both organizations are undertaking an extensive evaluation of their past efforts and determining a strategy for the future that continues to enhance interaction between neuroscientists and the public around the world. Although Brain Awareness Week provides a wonderful focus every spring, the responsibility for keeping the public informed is a year-round effort.

To provide more continuity in the flow of public information, the society published a series called *Brain Research Success Stories* that addressed the advances made in a wide variety of neurological and psychiatric disorders directly attributable to the doubling of the National Institutes of Health (NIH) budget (SfN, 2006b). This series built upon the success of the society's most popular publication, *Brain Briefings* (SfN, 2006c), which describes in lay terms updates on selected neuroscience research topics. Such excellent publications respond partially to the goal of educating the lay audience; however, they are not a substitute for a presentation by an active neuroscience researcher. Indeed, in many instances, the public is as interested in the story of the scientist as in his/her science. This need is no more evident

than in the K–12 classroom, where a visiting scientist can become a role model for a young mind and especially inspire students who are traditionally underrepresented in the sciences. The Society also publishes *Brain Facts* (SfN, 2005), a 64-page primer on the brain and nervous system for lay audiences that is updated every three years.

To underscore the importance of public education, the society acknowledges prominent scientists who are making significant contributions to the public education mission. In 2003, the first Science Educator Award was presented at the annual meeting. Each year, this award is announced and the education-related accomplishments of the recipient are read before one of the major plenary lectures at the annual meeting. This approach provides a chance for a large group of neuroscientists to hear how a colleague incorporated public education into his or her professional life. It is equally important to acknowledge the efforts of the more junior neuroscientists who are just starting out and are trying to balance this aspect of stewardship in their career plans. To acknowledge this group (undergraduate and graduate students and postdoctoral fellows), SfN will be launching a next-generation Science Educator Award at the 2006 annual meeting in Atlanta, GA.

To achieve the long-term goal of engaging more neuroscientists in public education, the CNL is proposing to the society's leadership that each member be expected to engage in one day of public education per year. Examples of these activities range from working with K–12 educators in classrooms, to lecturing in a public forum or giving testimony before a state or national legislator. Moving in this direction will require incentives initially to get scientists engaged. The National Science Foundation (NSF) has provided such an incentive as part of the Broader Impacts Criterion of its merit review (NSF, 2006). As such, all NSF-funded proposals are required to list up to five examples that demonstrate the broader impact of scholarship. There is no equivalent requirement for grants from the National Institutes of Health (NIH), but it has been a topic of discussion. For most neuroscientists, an expectation of public dialogue is not part of their culture and has not been emphasized during their training.

Thus, a second strategy that SfN is pursuing is a joint dialogue with the organizations that oversee training in the neurosciences—the Association of Neuroscience Departments and Programs and the Faculty for Undergraduate Neuroscience. These discussions have centered on how a requirement for community service (i.e., public education) might be phased in as part of a neuroscience degree program. Important data regarding this aspect of professional stewardship will emerge from the neuroscience programs involved in the Carnegie Initiative and will help guide the next steps. One option might be to request that a select group of training grant directors evaluate the positive and negative aspects of a requirement for public education for their trainees. If the positive outcomes greatly outweigh the negative aspects, then there would be a basis for approaching the NIH or others to consider adopting such a policy.

Traditionally, SfN sponsors a series of activities targeted at K–12 teachers and students during its annual meeting. The CNL strategic planning process resulted in two new initiatives to impact K–12 science education, because the annual meeting does not seem to be the optimal venue for many reasons.

Developing a Presence at National Science Teachers' Meetings

In the current Strategic Plan, building strong relationships with K–12 teachers is a prominent feature of the public education strategy. Teachers are a key link in introducing more neuroscience into the K–12 curriculum and in initiating information flow to the public. To better understand how to create professional development programs for teachers and build long-term partnerships between neuroscientists and teachers, SfN has developed a presence at the annual conventions of the National Association of Biology Teachers (NABT) and the National Science Teachers Association (NSTA).

Neuroscience as a discipline is not strongly represented in the K–12 or in the National Science Education Standards (National Academies of Science, 1995). As such, it is important that the SfN make resources available that are aligned with these standards and integrate neuroscience examples to address existing standards. Because neuroscience is not a topic that is familiar to most K–12 teachers, it is important to provide professional development for teachers on how our discipline can be integrated into their curriculum. In response to this need, workshops featuring a series of hands-on exercises were shifted from the society's annual meeting (where it drew a few dozen teachers) to the NSTA and NABT meetings, thus reaching a larger audience. The goal was to provide classroom exercises that teachers can adopt to fulfill local and national standards in chemistry, physics, and biology. Equally important as these hands-on activities is making available some of our best spokespersons to give plenary lectures regarding the current advances in the field. Based on feedback from advisory groups of teachers representing various disciplines, the society will continue to identify speakers in the expressed interest areas and prepare them to effectively communicate key scientific information to an audience of educators with varying backgrounds.

Another effort that SfN has expended to raise its visibility and that of the research community at national science teacher meetings was to cooperate in the formation of the "Research Zone" in collaboration with the NIH Office of Science Education. Starting with the 2004 NABT meeting, all exhibits of the various institutes of the NIH, scientific societies, and biomedical research associations were clustered into one area within the exhibit hall. This organization provided teachers with a landmark to explore the vast resources of the biomedical research community. The clustering also enhanced the interactions between the partnering scientific organizations, yielding new initiatives such as a common approach to discussing the ethical use of humans and animals in research. In the future, it is hoped that this coalition of groups will partner with the organizers of NABT and NSTA, expanding the Research Zone and optimizing exposure to the education community.

Developing a Common Message on Animal Research

There is no one topic that unites the biomedical research community more than the need to explain the benefits of animal research to the general public. This aspect of professional development of scientists is almost totally overlooked

and, as such, they are unprepared to navigate this discussion. Besides preparing neuroscientists for this dialogue, it is important to introduce teachers to a balanced message on this subject. One desirable place for a discussion about the use of animals in research is in the classroom. Currently, the animal rights movement has expended significant efforts in the classroom, and their viewpoints have gone largely unopposed. To introduce a large group of teachers to the debate over animals in research, it might be effective to organize a session at one of the national science teachers' meetings. To this end, the SfN has brought together a coalition of interested parties, including professional scientific societies, biomedical research support groups, and organizations that fund such research to explore the development of a common message and a strategy for establishing a dialogue in the classroom. The relative importance of participating in the public dialogue about the use of animals in research has been underscored in SfN's Strategic Plan, where it is articulated as a key social and science policy issue.

In conclusion, the SfN, with the guidance of the CNL, has developed a strategic plan to actively engage our membership in science education and to continue to invest in public education at all levels. A desired outcome is that the culture of conducting biomedical research will embrace public education as an integral component. We have set out to shift this culture and invest intentionally in supporting our members to become engaged.

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