

ARTICLE

Brain Awareness Week and Beyond: Encouraging the Next Generation

Colleen D. McNerney,¹ Eun-Joo Chang,¹ and Nicholas C. Spitzer²

¹Society for Neuroscience, Washington, DC, 20005; ²Neurobiology Section, UCSD, La Jolla, CA 92093

The field of neuroscience is generating increased public appetite for information about exciting brain research and discoveries. As stewards of the discipline, together with FUN and others, the Society for Neuroscience (SfN) embraces public outreach and education as essential to its mission of promoting understanding of the brain and nervous system. The Society looks to its members, particularly the younger generation of neuroscientists, to inspire, inform and engage citizens of all ages, and most importantly our youth, in this important endeavor.

Here we review SfN programs and resources that support public outreach efforts to inform, educate and tell the story of neuroscience. We describe the important role the Brain Awareness campaign has played in achieving this goal and highlight opportunities for FUN members and students to contribute to this growing effort. We discuss

specific programs that provide additional opportunities for neuroscientists to get involved with K-12 teachers and students in ways that inspire youth to pursue further studies and possible careers in science. We draw attention to SfN resources that support outreach to broader audiences.

Through ongoing partnerships such as that between SfN and FUN, the neuroscience community is well positioned to pursue novel approaches and resources, including harnessing the power of the Internet. These efforts will increase science literacy among our citizens and garner more robust support for scientific research.

Key words: Public Education, Brain Awareness Week (BAW), Neuroscience Core Concepts, NERVE, Neuroscientist-Teacher-Partner Program, Science Olympiad, International Brain Bee, Wikipedia

Public outreach and education serve as a cornerstone for the Society for Neuroscience (SfN), now celebrating its 40th year. An essential strategy in SfN's mission to promote understanding of the brain and nervous system involves engaging Society members, nearly 39,000 strong. Of these members, an increasing number (26 percent in 2008) are undergraduate and graduate students, the next generation of neuroscientists.

As mentors to young neuroscientists, educators (including FUN members) have tremendous opportunities as well as a responsibility to inspire and engage students in the public education endeavor. The current environment encourages sharing and promoting neuroscience research and discoveries with the public. People have an ever-increasing appetite for information about the brain, evidenced by heightened media attention to neuroscience-related topics.

This article reviews SfN programs and numerous easy-to-use resources that support public education outreach efforts and highlights opportunities for FUN members and students to become involved and contribute to exciting the public about the wonders of the brain.

BRAIN AWARENESS: The Campaign

Nearly 15 years ago, the Dana Foundation had a vision for a Brain Awareness Week (BAW) that would reach a global audience and be fueled by the passion, commitment and knowledge of the neuroscience community (Dana Foundation, 2009). Through leadership by the Dana Alliance for Brain Initiatives (DABI) and its sister organization, the European Dana Alliance for the Brain, BAW has evolved into a powerful global initiative with more than 2,200 partners in 76 countries (Dana, 2009). Many groups, implementing creative activities and events, join



Figure 1. 2009 University of Washington Brain Awareness Week Open House supported by: Hope Heart Institute, Pacific Cascade Chapter of SfN, UW Engineered Biomaterials, UW Graduate Program in Neurobiology and Behavior, and the UW Student Activities and Union Facilities.

this effort each year to reach exponentially growing numbers of people around the world. Increasingly, Brain Awareness efforts are taking place year-round and compelling stories about the impact of neuroscience research are being shared with educators and the public.

Each year at the Society's annual meeting, SfN's Public Education and Communication Committee (PECC), which strives to respond to the needs of neuroscience students

as well as promote education and information efforts for the public, organizes a Brain Awareness campaign event. The event features speakers who have made notable contributions to public outreach and provides a forum for BAW participants to showcase their innovative activities. The event grew to nearly 300 participants in 2008.

Many FUN faculty members have been active participants in Brain Awareness Week activities since its inception. Over the past three years, FUN has contributed significantly to the Brain Awareness efforts undertaken by SfN, largely through the creation of a FUN liaison to PECC. Alan Gittis from Westminster College is the current FUN liaison and an active member of PECC's Brain Awareness Subcommittee.

At Neuroscience 2008, SfN surveyed meeting attendees and asked, "Do you actively participate in neuroscience education outreach activities, such as the Brain Awareness campaign?" Of the nearly 25,000 respondents, more than half reported they actively participate, have participated in the past, or (and this is key) do not participate but are interested in learning how to get involved. This latter group represents 33 percent of the total responses (SfN, 2008). This level of interest underscores the need for easily accessible tools and resources and as well as opportunities to become engaged.

Get Involved and Be Recognized

In an effort to tap the 138 SfN chapters around the globe and thousands of others who follow the BAW and other educational outreach efforts, SfN recently launched a quarterly e-newsletter, *Brain Awareness Headlines—For the Neuroscience Education Enthusiast*. This newsletter highlights resources, provides updates on new programs and models, and addresses how interested individuals can get involved with BAW. (To subscribe, visit: www.sfn.org/baw.) Organized groups, such as the SfN chapters, neuroscience clubs and Nu Rho Psi, serve as models and catalysts for Brain Awareness activities throughout the year. Individuals interested in getting involved should contact one of these groups.

SfN also offers several opportunities for students and junior faculty to be recognized for active involvement in outreach efforts, including but not limited to BAW. The **Next Generation Awards**, presented at the Neuroscience annual meeting, recognize pre-doctoral and post-doctoral trainees and junior faculty members who are nominated by an SfN chapter for outstanding contributions to public communication, outreach, and education about neuroscience.

The **FUN/SfN BAW Travel Award**, new in 2009, specifically supports undergraduates who engage in Brain Awareness activities. The award provides \$750 for travel expenses plus complimentary registration to attend Neuroscience 2009 in Chicago. Applicants must be an author on a poster and present results from a Brain Awareness activity conducted while an undergraduate.

More information is available on the FUN Web site (<http://www.funfaculty.org/drupal/>).

NEW EDUCATIONAL RESOURCES

Neuroscience Core Concepts

To enhance knowledge about "essential principles" that the public and teachers should know about the brain and nervous system, SfN recently unveiled a new resource that presents eight *Neuroscience Core Concepts*. They address fundamental topics like: how your brain works and how it is formed; how it guides you through changes in life; and why it is important to increase understanding of the brain. They are available online and through a printed, poster-sized pamphlet for classroom use.

A product of 18 months of intensive development led by PECC and robust collaboration of numerous stakeholders, *Neuroscience Core Concepts* offers the most important insights gained through decades of brain research. The new tool includes a glossary of common neuroscience terms and basic anatomical diagrams, and provides educators in the United States with a correlation to science education standards. The *Neuroscience Core Concepts* is a living document that will be updated as the field evolves and new information emerges. Copies of the pamphlet are available for free and as a downloadable PDF file



Figure 2. Neuroscience Core Concepts

Figure 3. NERVE home page.

(www.sfn.org/coreconcepts) on the SfN Web site. We urge FUN members, SfN chapters, K-12 educators, and others to utilize *Neuroscience Core Concepts* to expand the reach and potential of this peer-reviewed resource.

Have You Got NERVE?

In response to needs expressed by Society members and K-12 educators, SfN launched the Neuroscience Education Resources Virtual Encycloportal (NERVE) in fall 2008. NERVE is an online gateway to current, credible education resources for teaching about the brain and nervous system.

NERVE provides easy access to a variety of more than 250 education resources and organizes these resources according to content themes popular with K-12 teachers. For example, teachers who may not initially consider teaching neuroscience to second graders may actually find it easy, using the “brain basics” area of the site, which provides exciting, age-appropriate resources to teach on a variety of subjects, such as the sensory system. Likewise, scientists who interact with middle school teachers find the site helpful because it focuses on resources specific to their content area and tailored for a particular age group.

NERVE also provides ideas for Brain Awareness activities, teacher professional development workshops, and even university classes. The majority of NERVE users are teachers (79 percent). Out of that group, 60 percent report teaching at the undergraduate, graduate or post-doctorate level (SfN, 2009). A recent commentary in *The*

Journal of Neuroscience encouraged neuroscientists to contribute resources to NERVE (Frantz et al., 2009). The “Suggest a Resource” button on the site puts users in direct contact with the site curator.

The response to NERVE underscores the demand for such online resources and demonstrates the need to expand beyond the K-12 classroom and encompass the entire education spectrum. SfN, in collaboration with FUN and the Association of Neuroscience Departments and Programs, developed a model for an expanded neuroscience education portal to high-quality vetted resources for teaching neuroscience at the K-12 and higher education levels. The Society is currently seeking funding to integrate the NERVE site into a comprehensive resource gateway with enhanced features that allow users to provide feedback, share experiences and participate in online educational communities.

ENGAGING WITH K-12 TEACHERS AND STUDENTS

One of the easiest ways for neuroscience students and faculty to get involved in K-12 classrooms is through the **Neuroscientist-Teacher Partner Program** (NTP, www.sfn.org/ntp). The program has grown to more than 600 neuroscience students and faculty who have volunteered to serve as partners for K-12 teachers. Teachers can search the NTP database by state to find the names and locations of participating neuroscientist experts. Some teachers want to develop an e-mail exchange, others want a scientist to visit their classroom, while others

want to discuss a science topic and gather additional information as they prepare a unit or laboratory experiment. SfN supports the program by providing volunteers with access to appropriate education resources and promoting the program to the K-12 community.

Two other programs supported by SfN offer additional opportunities for neuroscience students and faculty to engage first-hand in education outreach efforts – Science Olympiad and International Brain Bee.

The **Science Olympiad** (www.soinc.org) is a 25-year-old national “academic track meet” (Science Olympiad, 2009) competition that attracts and encourages students to study science. Nearly 240 regional competitions involving some 200,000 students are held annually in 47 states, creating a steady need for volunteer coaches, event volunteers, and guest advisors. SfN has contributed for the past two years, sponsoring two national-level events that feature neuroscience subject matter. James Olson, a faculty member in neuroscience at Wright State University, has been involved in the program as a team coach and leader. He developed a neuroscience-related event that was incorporated into the Science Olympiad competitions. Olson reports that students get so involved and consumed in the science they never look back. “At least three of the students I coached to the national competition in Health Science (with neuroscience as a focus) are now pursuing neuroscience as undergraduates. Two are in academic neuroscience laboratories. All are majoring in a biomedical science-type degree program,” Olson said.

The **International Brain Bee** (www.internationalbrainbee.com), directed by its founder Norbert Myslinski of the University of Maryland, seeks to motivate students to learn about the brain and to inspire them to pursue careers in neuroscience. More than 20 countries and nearly 30 states are involved in local, national and international competitions that rely on volunteers from the neuroscience community. SfN sponsors summer lab internships for the winners of the U.S., Canadian and International Brain Bees.

The Society has also established partnerships with the **National Science Teachers Association (NSTA)** and the **National Association of Biology Teachers (NABT)** as a means of extending outreach to K-12 educators. SfN exhibits at NSTA and NABT national conferences, distributing resources and bringing neuroscientists to interact with teachers. In addition, SfN offers hands-on workshops at the NSTA meetings and solicits the SfN membership for workshop proposals each year. The 2009 NSTA meeting featured workshops designed around a major lecture on “What Neuroscience Can Teach Us About Teaching” presented by SfN President Tom Carew. The workshops generated tremendous positive feedback and interest in neuroscience among the participating teachers.

Additional Resources

Providing students and K-12 teachers with the basic underpinnings of neuroscience and exposure to the dynamism of the research enterprise is aided by three additional resources: ***Brain Facts***, ***Brain Briefings*** and ***Research & Discoveries***.

The Society recently released a new edition of ***Brain Facts*** (www.sfn.org/brainfacts), a popular primer on the brain and nervous system designed for a lay audience as an introduction to neuroscience. For the first time, the resource is available on CD-ROM and online in a downloadable, chapter-by-chapter format.

Popular among teachers is ***Brain Briefings*** (www.sfn.org/briefings), SfN’s lay-language newsletter series explaining how basic neuroscience discoveries lead to clinical applications. Recent issues focus on “The Bilingual Brain” and “Post-Traumatic Stress Disorder.”

A new series, entitled ***Research & Discoveries*** (www.sfn.org/rd), chronicles examples of curiosity-driven research advances that create promise for the treatment of neurological and psychiatric disorders. Written in lay language, the series highlights the ways in which basic research advances scientific knowledge and how clinical researchers exploit these findings and identify new applications that lead to medical treatments. There are currently four pamphlets in the series: Light Molecules, Brain Plasticity and Alzheimer’s Disease, Vision and Gene Therapy, and Toxins and Venoms.



Figure 4. The Philadelphia Chapter of SfN engages local students with various brain models.

FUTURE DIRECTIONS

SfN continues to explore new and effective ways to educate the public about the wonders of the brain, and to leverage partnerships with FUN and others in the process.

The Society’s newest initiative aims to harness the power of Wikipedia, the largest and most widely used online source of general reference information. The effort encourages the neuroscience community to engage in a broad public education strategy by improving the neuroscience-related content on Wikipedia (<http://en.wikipedia.org/wiki/Neuroscience>). Following a call to the membership, SfN will look to FUN and other groups to help encourage undergraduate and graduate neuroscience programs to formally engage students in developing Wikipedia content. More information on the initiative can be found at www.sfn.org/Wikipedia.

Efforts are underway at SfN to develop an enhanced Brain Awareness Web site that will offer ideas and support

to first-time BAW participants, along with enhanced features for all users. DABI's redesigned BAW site (www.dana.org/brainweek) serves as an excellent model and resource.

Through both new and ongoing efforts, SfN will continue to work closely with its partners to develop novel ideas, tools and resources to support neuroscientists engaging in public outreach activities. These efforts will enable those immersed in coursework at the beginning of their careers as well as established faculty and researchers to successfully navigate the public education arena. Robust and sustained participation by the neuroscience profession in informing and exciting students and the public about the wonders of the brain will result in increased neuroscience literacy and public support for scientific research. Such support is critical for continued scientific progress and advances that can lead to the improved health and well-being of society.

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Received April 20, 2009; revised June 01, 2009; accepted June 01, 2009.

Address correspondence to: Dr. Colleen D. McNerney, Society for Neuroscience, Washington, DC 20005. Email: cmcnerney@sfn.org.

Brain Awareness Week 2010
March 15 - 21