

NEUROSCIENCE

WINTER 2012

Q U A R T E R L Y

“Neuroscience welcomes all who are interested in the profound challenges associated with understanding the brain and nervous system.”

— Moses Chao,
SfN President

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European Advocacy Grants Program Announces First Recipients

The Federation of European Neuroscience Societies (FENS) and SfN have announced the first 10 grantees in the FENS-SfN Advocacy Grants Program, a 3-year pilot initiative to advance advocacy for neuroscience in European countries.

The program, co-funded by FENS and SfN with each contributing €25,000 per year, reflects the strong desire by both organizations to enhance the effectiveness of national advocacy efforts and provide expanded advocacy opportunities for their members. The program is consistent with SfN’s successful strategy to provide sustained early funding for advocacy in Canada, which is now producing significant gains through Brain Canada, as well as successful support for education and advocacy efforts in Mexico.

“SfN strongly supports advocacy engagement by members, including all non-U.S. members,” said SfN President Moses Chao. “At the same time, SfN recognizes that each country has unique funding systems, political structures, and cultures when it comes to

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Message from the President

What Is a Neuroscientist?



Moses Chao,
SfN President

More than one department chair has remarked to me that I am not a neuroscientist. After being taken aback by the comment, I realized the reason for their conclusion: Trained as a molecular and cell biologist, I was not exposed as a student to training in physiology, the classical backbone of neuroscience research. Hence, I was not considered a neuroscientist. Or was I? What then, if anything, is a neuroscientist?

This question seems particularly relevant as I write my first column as president of the Society for Neuroscience. It also is a worthy conversation as the field continues to grow into an ever more dynamic and diverse community. Evidence of this includes the Society’s record membership figure in 2011, topping 42,000. The Society is actively evaluating and launching new programming to serve the evolving needs of our membership.

There is great value in the field’s commitment to encourage both diversity and unity simultaneously. This combination is precisely what keeps our collective research, discovery, and knowledge on an aggressive growth trajectory. This growth results in the generation of new ideas, perspectives, and questions.

Neuroscience welcomes all who are interested in the profound challenges associated with understanding the brain and nervous system, including those scientists and clinicians with diverse training and skills.

Continued on page 2...

A diverse group of investigators is more likely to be effective in creating new technologies, solving complex problems, and coming up with creative solutions. Examples abound. The intracellular mechanisms behind programmed cell death, studied in the 1940s, arose from a genetic analysis of *C. elegans*. The origin of the polymerase chain reaction was based on DNA enzymology and the fortuitous discovery of bacterial polymerases resistant to high temperature. Likewise, fluorescent proteins and optogenetics were derived from studies of different forms of bacteria and green algae — not the usual subjects of a neuroscientist.

The origins of neuroscience can be traced to the anatomy and physiology communities, which included Charles Sherrington, who studied the physiology of spinal reflexes and perception, as well as Hodgkin and Huxley, who used mathematical models to describe the movement of ions during an action potential. The American Physiological Society (APS), which originated in 1887 and represents more than 10,500 scientists, carries on from these research traditions. It was a group of physiologists who broke away from APS in 1969 to form SfN. (*Editor's note:* read Robert Doty's article about the history of SfN's founding at www.sfn.org/sfnhistory).

Today, neuroscience has embraced not only electrophysiology, but also many other disciplines including genetics, biochemistry, cell biology, endocrinology, physics, computer science, and mathematics, not to mention the fields of psychology, radiology, psychiatry, neurology, neuroimmunology, and the newer areas of neuroeconomics, neurolaw, neurotechnology, neuropolitics, and social neuroscience. This explosion in the evolution of neuroscience has caused some to worry that the term “neuro” is both misused and overused and perhaps also has contributed to confusion about “what is a neuroscientist.”

Defining a neuroscientist is also a common problem among medical centers and universities. For example, should an institutional Web site organize a list of all scientists in every department or institute who work on the brain or the spinal cord? Or should there be only one Department of Neuroscience with a smaller, more defined membership? How are clinical scientists interested in neurosurgery and traumatic brain injury included in such a listing? Moreover, should neurologists and psychiatrists belong to separate departments or in an integrated brain institute with everyone else?

This predicament is exacerbated by the traditional tendency of academia to place faculty and researchers in separate departments, a decision often dictated by undergraduate, graduate, and medical school teaching resulting in basic science departments of biochemistry, microbiology, cell biology, pharmacology, physiology, and others. This also can create silos that impede interactions between different

departments, particularly on the research front, and can result in “turf” battles over space and recruitment issues. There are now attempts in many schools to eliminate departments in favor of programs or institutes, combining disciplines and encouraging more collaboration.

Perhaps there are lessons to be learned from the state of science in the 15th and 16th centuries — the study of nature was referred to as natural philosophy and included physics, chemistry, astronomy, mathematics, and the study of mechanics and matter. It represented a concerted analysis of nature and the physical universe in all its dimensions, without making separate categories for each area. So it would be advantageous to take a much broader and more unified view of neuroscience rather than to separate the field into a series of narrow, specialized disciplines.

SfN has long resisted the urge to split up the annual meeting into smaller meetings or to start spin-offs from *The Journal of Neuroscience*. In fact, *The Journal* does a remarkable job merging various scientific areas together into a single place. As a former senior editor, I look forward to reading the table of contents each week. I always find something from a different field that draws me in and gets me to explore outside my own area. The annual meeting provides this same opportunity. Over the years, I have walked down the poster floor and seen many changes in the field. Because the meeting is so diverse I always find insight into new areas of scientific pursuit, which frequently break down traditional silos.

Fostering this kind of collaboration is tremendously important. We should avoid “drawing a line” about who is and isn't a neuroscientist and instead focus on exploring and going beyond our own interests. Simply put, problems we face in neurobiology and neurology require new techniques and perspectives from outside the traditional boundaries. We all need to be more intentional about seeking to understand and leverage other fields, instead of defining them out of the neuroscience field. We should also encourage students, labs, and institutions to see this diversity as a strength: The future will be won by those scientists who are skilled in many areas, foster dialogue, and leverage ideas and technology beyond their own areas.

With its growing size, neuroscience is now better powered to ask the infinite number of broad and fine questions inherent in the study of the brain and nervous system. With the diversity of backgrounds, we also are better equipped to pursue all means to answer them. It is likely that basic discoveries will inform future knowledge, treatments, and applications of neuroscience. Given our challenging field, I am confident it will take every one of our 42,000+ experiences, and more, to achieve them. ■

U.S. Advocacy: Uncertainty Abounds as Election Year Heats Up

With the release of the President's budget in early February and the continued drive by some in Congress to slash funding — regardless of the consequences — it's hard to predict what the impact will be on federal funding for biomedical research. Congress has often seen a unique value in research, and funding for agencies such as NIH and the National Science Foundation (NSF) has traditionally enjoyed broad bipartisan support. In an era of shrinking budgets at virtually every federal agency, even the relatively small increases in research funding stand out. However, as the broader debate over the size of the federal government continues, these programs could become entangled in broader budget politics, resulting in cuts.

Against that backdrop, the outlook for federal funding could fall into a wide range. For example, NIH funding for the current fiscal year is \$30.6 billion, or about 0.8 percent above last year. At the same time, last summer's negotiations over the debt limit increase could still result in a cut to all federal programs next year, potentially in the range of \$3 billion (9 percent) for NIH. The longer the debate drags on during this election year, the less predictable the funding situation will be. Given the level of uncertainty,

advocacy engagement by Society members is essential. Members of Congress need to hear about how the decisions they make concerning research funding affect the health and economic well-being of their constituents.

BRING YOUR VOICE TO CAPITOL HILL

Want to become an advocate for science funding or looking for a new way to get your chapter involved in advocacy? This spring, SfN members, including chapter representatives from across the United States, will take a strong message to Capitol Hill: Make biomedical research a national priority. Hill Day is an advocacy activity that connects neuroscientists with their members of Congress to highlight the latest neuroscience discoveries and the need for strong, sustainable funding platforms for NIH and NSF. Your scientific voice is essential to educating lawmakers on the value of science funding to their constituents and the national economy. The SfN Chapter Grant Awards are now eligible for advocacy activities, including Hill Day. Plan to attend the 5th Annual SfN Capitol Hill Day on March 29. For details, visit www.sfn.org/hillday. For information on SfN Chapter Grant Awards, visit www.sfn.org/chaptergrants. ■

Find Neuroscience Opportunities and Resources

AROUND THE WORLD

SfN is the largest individual membership society for neuroscientists in the world. With 39 percent of members residing outside of the United States, SfN provides a range of benefits and resources for its global membership:

- Professional development training
- International funding
- Foreign-language public outreach resources

Learn more at www.sfn.org/global.



Stuart Zola: Communicating Science and Animal Research to the Public



Stuart Zola, Yerkes National Primate Center Director

Stuart Zola is the director of the Yerkes National Primate Research Center and a professor of Psychiatry and Behavioral Sciences at the Emory University School of Medicine in Atlanta, Ga. Zola's work focuses on how the brain organizes memory and how this process relates to memory loss. Zola also is active in communicating science and research to the general public. Neuroscience Quarterly asked him about communicating science and animal

research. He answered in collaboration with Lisa Newbern, Yerkes chief of public affairs.

NQ: Yerkes is very proactive in its communication about the importance of research and the values that guide its work. As an institutional leader, how have you shaped Yerkes' communications approach and what is the public response?

In two words, proactive and positive! When I became director of the Yerkes Research Center, I knew I wanted to support a robust public outreach program to help members of the Emory community, the surrounding neighborhoods, and the greater Atlanta community truly understand what a unique resource the Yerkes Research Center is. It took about a year to find the right communications director to partner with me on this vision, but it's been nonstop since then. The positive response from the public is remarkable. Not a day goes by that we don't receive some type of request related to our educational outreach. From the internships we offer high school and college students to our speakers' bureau and tour programs, I believe we are taking all the right steps. By training future generations of researchers and leaders, as well as educating others about the incredible value of our research, we are enhancing scientific literacy locally and nationally. Moreover, we continue to share the view that we take seriously the stewardship of animals while at the same time meeting our obligation for developing knowledge, treatments, and cures that will improve the quality of life for us all. An important message that we always try to be mindful to deliver is that the discoveries, treatments, and cures derived from research with animals comes full circle to benefit animals, as well as humans. It is ironic but true that the ability of your veterinarian to diagnose and treat your pet successfully often depends on the very same research that animal activists oppose.

NQ: What primary and secondary education programs has Yerkes found to be most effective in communicating the value and process of animal research, and why are they so effective?

I believe it's very important for our researchers to talk with members of the community, students, and others about what they do, how they do it, what results they are achieving, and how their results are improving human health. It's this hands-on approach that makes a lasting difference — when you hear directly from the person whose goal it is to discover treatments and cures for diseases, you remember that and, I hope, share it with others. Accordingly, we have developed a speakers' bureau through which many of our scientists visit both primary and secondary schools throughout the year. We have also developed an Open House program that brings many school groups into the Yerkes Center to talk with scientists and to see the animals firsthand. For several years we have had the opportunity to bring high school students and high school science teachers to the Yerkes Center for summer internships. Our research faculty, postdoctoral fellows, and graduate students agree to mentor the students and teachers, and they get the chance to do real, daily, hands-on research in a variety of different laboratories and research settings. At a special symposium, capping the summer internship, we typically hear comments from the interns about the summer of science at Yerkes being “a life-changing experience.” We believe these kinds of opportunities help enhance the pipeline for developing students who will choose careers in science and improve science education in our school systems.

NQ: What advice would you have for individual researchers to enhance their own communication about animal research? Would you have a special message for younger members such as students and postdoctoral fellows?

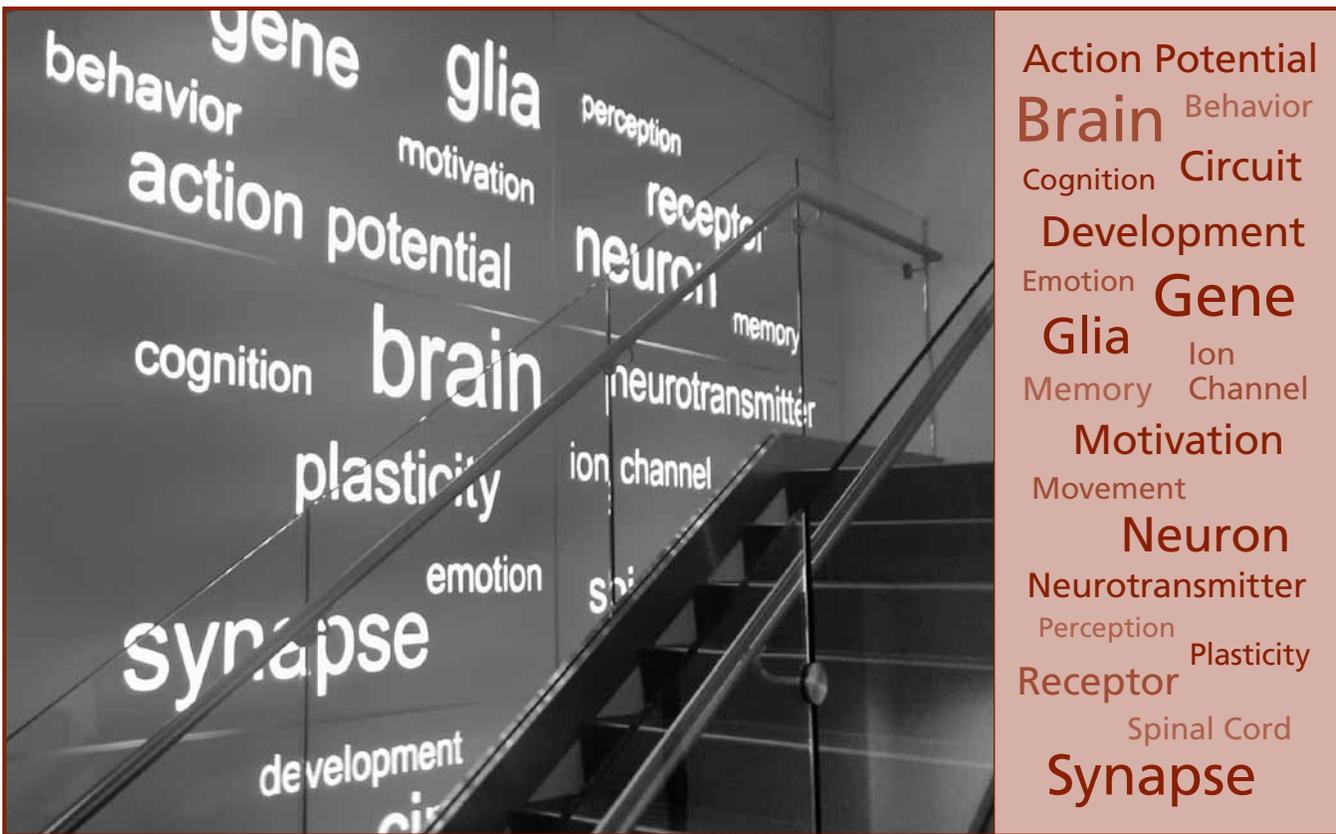
Work with and trust your communications officer! It truly is a partnership among administrators, researchers, and communications officers to ensure messages are being shared appropriately and that you never feel like you are on your own. Also, your communications officer will have a more global perspective about research at your center and across the country, so it's important to work together to develop messages that will resonate with the general public and inspire them to support what we are doing. Additionally, there are a number of both local and national resources, e.g., the Society for Neuroscience and the National Association for Biomedical Research, that provide information, talking points, and even public speaking training to help prepare individuals to engage effectively with

the public and their colleagues about the use of animals in research. A key aspect of communicating with the public, the media, or anyone, is establishing trust. So, an important piece of advice to always keep in mind is to be sincere in your views about what you are discussing. If you do not truly believe in the value of what you are saying, it is probably better not to do the interview because you will not be able to communicate sincerely, and you will likely fail in establishing trust and in making your point convincingly. You do not necessarily have to be an expert in an area to believe in its value, and its value is what you want to communicate.

NQ: What can institutions and organizations within the research community do to convey the importance of responsible animal research to medical progress? Are there roles that journals, meetings, societies, institutions, or others must play, either individually or together?

It is important that the highest administrative and executive levels of an institution or organization be informed about the issues of animals in research and that they

communicate to all levels that carrying out animal research is recognized by the administration as an important part of the organization’s mission. For faculty, students, and staff to be engaged in research with animals, and for them to engage in discussions with the media and the public successfully, they need to know that the highest levels of the institution or organization trust and believe in the mission and back them in their research with animals. We must work together, and we must be forthright and honest. It is the responsibility of each one of us to be able to talk about our research. That includes talking about not just the findings, but also about the care of the animals and how that can affect the outcome of experiments. If an error or mistake has been made in the context of animal welfare, we need to be upfront about that, determine the cause and how to prevent it from recurring, and communicate all of that openly and sincerely. Journals and meetings must underscore the importance of appropriate stewardship of animals used in research, and institutions must ensure that appropriate stewardship does take place. Together, all of these efforts will help the public understand, trust, and therein support the critical role of animals in research. ■



Several areas of the SfN headquarters building in Washington, DC, feature visual presentations of neuroscience. Through these installations, SfN educates visitors about the history, beauty, and progress of neuroscience. The newest installation is a backlit “word cloud” highlighting key terminology and concepts in the dynamic and growing discipline. Conceived and designed by Envision Design PLLC, the word cloud was installed adjoining the staircase connecting SfN’s expanded workspace completed last fall.

Making Strides in Understanding Neurodevelopmental Disorders

For years, our understanding of autism spectrum disorders (ASD) has been confounded by their exceptional complexity. At Neuroscience 2011, Emanuel DiCicco-Bloom of the Robert Wood Johnson Medical School and Rutgers University chaired a press conference that aimed to present a clearer picture of ASD. DiCicco-Bloom pointed out, “We aren’t dealing with one autism,” rather, the spectrum describes many different, yet related disorders. And while these conditions have been grouped according to their behavioral consequences — their phenotypes — they might arise from different underlying causes. During the press conference, scientists described new findings in animal and human research about this complicated set of diseases and related disorders.

THE EYES HAVE IT

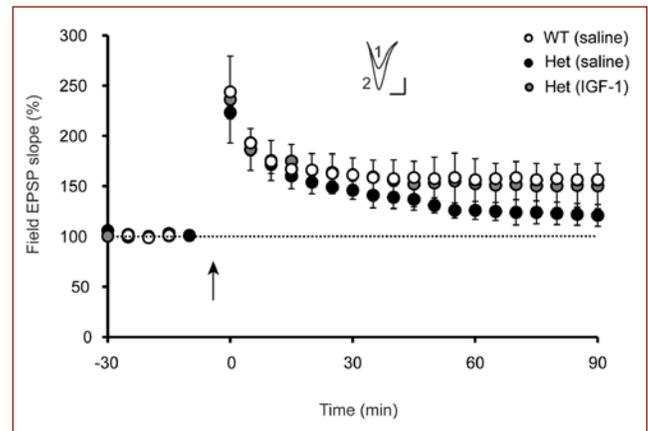
Like children with ASD, children with bipolar disorder have trouble identifying emotions in others’ faces, which likely contributes to difficulties with social interactions. Pilyoung Kim and colleagues at the National Institute of Mental Health investigated the underpinnings of the deficit. Unlike healthy volunteer children, children with bipolar disorder failed to accurately label the emotions in images of angry, fearful, happy, sad, or neutral faces.

Why? Kim found children with bipolar disorder made fewer and shorter visual fixations on the eyes and spent more time than other children looking at noses and mouths. Those children with bipolar disorder who did spend more time focusing on eyes scored better on labeling emotions. These findings might suggest a therapeutic strategy to help children better interact with others: teach them to look to eyes for emotional cues.

FRAGILE X MENTAL RETARDATION PROTEIN: A KEY REGULATOR

Fragile X syndrome provides a unique opportunity to study ASD. About a third of boys with fragile X are diagnosed with ASD, and the disorders share some behavioral elements. But unlike ASD, fragile X syndrome arises from a mutation in one specific gene, FMR1, which codes for fragile X mental retardation protein (FMRP). The mutation shuts down production of FMRP. FMRP seems to act as a regulatory “brake” on protein translation by binding to the mRNAs encoding other proteins.

Scientists at Yale University Medical School, led by Susan Goebel-Goody, studied one of the proteins regulated by FMRP called striatal-enriched tyrosine phosphatase



In slices from Shank3 heterozygous mice LTP was abolished, as shown by the reduced field EPSP levels between 60–90 minutes. Field EPSP levels were restored in mice injected with IGF-1. The inset shows representative EPSP traces at 90 minutes after LTP introduction from saline-injected (1) and IGF-1-injected (2) mice (scale bar: 0.5 mV, 10 ms). Courtesy, with permission, Bozdagi et al., submitted.

(STEP). STEP is a brain enzyme that removes phosphate molecules from many different proteins, often terminating a cellular signal. Because STEP protein production goes unchecked without the FMRP “brake,” researchers thought STEP over-activity might underlie some of the shared symptoms of ASD and fragile X syndrome. They used mice lacking the Fmr1 gene as a model of fragile X. By breeding these mice with mice lacking the gene for STEP, Goebel-Goody produced mice that lacked both proteins.

To examine their social exploratory behaviors, the mice were given access to a “stranger mouse” enclosed in a wire cup and to an empty wire cup, both within their cage. Mice lacking FMRP made shorter visits and spent less time near the stranger than did wildtype controls. While fragile X model mice “do have the ability” to interact socially, Goebel-Goody said, “they’re unable to appropriately maintain those interactions.” When even one copy of the STEP gene was removed from the fragile X mice — reducing the amount of excess STEP enzyme by about half — their social exploratory behavior was restored to normal.

The results suggest STEP over-activity may underlie some of the social deficits seen in the fragile X syndrome model. The result also identifies STEP as a potential therapeutic target; drugs that reduce STEP activity could perhaps affect social behaviors in some children with fragile X syndrome or ASD.

What is the role for FMR1 in normal brain function? To get a better picture, Susan Rivera and her colleagues at the University of California, Davis studied healthy men using genetic tests, brain imaging, and a test of working memory. Even within the normal population, mild mutations of FMR1 can cause memory impairments and increased risk of anxiety and other psychiatric disorders. These “premutation carriers” show higher levels of FMR1 mRNA — which might interfere with FMRP protein function.

In men with elevated levels of FMR1 mRNA, “the structural integrity of brain areas gets worse,” explained Rivera. Likewise, higher mRNA levels were linked to worse performance on working-memory tests. The men’s memory performance also was correlated to the inter-connectivity seen on their brain scans. Although the specific mechanisms have yet to be defined, FMRP seems to play a key role in setting up neuronal connections in the healthy brain, with direct effects on cognitive ability.

INSULIN-LIKE GROWTH FACTOR 1 (IGF-1) AS A POTENTIAL THERAPEUTIC

Joseph Buxbaum described the approach of his team at Mount Sinai School of Medicine in understanding ASD: “We try to be translational and move things forward to patients.” Mutations in the SHANK3 gene have been linked

to ASD, and Shank3 mutant mice display altered neuronal communication properties. Particularly, they show deficits in long-term potentiation (LTP). Buxbaum showed that, in these mice, treatment with IGF-1 restored LTP and levels of the AMPA-type glutamate receptor. Subtle motor behavior deficits also improved in the mice with IGF-1 treatment.

Because a clinical formulation of IGF-1 already has FDA approval for use in children, the group has been approved to begin clinical trials for children with either the SHANK3 mutation or an ASD diagnosis. Buxbaum hopes the approach will be widely applicable to many ASDs. “We want to develop therapies that have the greatest impact. I don’t want to cure one autism,” Buxbaum said.

What unites SHANK3, FMRP, and STEP? Each appears to profoundly affect the synapse. SHANK3 is a scaffolding protein in the post-synaptic density. FMRP and STEP regulate other synaptic proteins. Furthermore, FMRP regulates the translation of SHANK3 and STEP.

Press conference participants noted that as part of the same pathway, independent mutations in each of these genes might result in the same phenotype, explaining how disparate genotypes could lead to the same ASD diagnosis. Hopefully, they noted, the commonalities between ASDs will help identify common causes and treatments. ■

ANNUAL SPRING CONFERENCE OF Neuroscience Departments and Programs

Sustaining Training Program Vitality During Challenging Times

March 30, 2012

Washington, DC

Featuring Keynote Speaker

Steven Hyman

Former Provost of Harvard University

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Join SfN for Capitol Hill Day on March 29. Plan to arrive in Washington, DC, a day early to take part in visiting with congressional representatives about the importance of national investment in biomedical research. To learn more, visit www.sfn.org/hillday.

advocacy. Partnering with FENS on this initiative enables SfN to support the goals of its members in Europe while helping FENS members tailor country-specific strategies that can increase public awareness and political support.”

“The joint advocacy grant program provides an important opportunity for FENS member societies to enhance funding for neuroscience in Europe while accommodating the distinct needs of each national neuroscience community and political system,” said FENS President Sten Grillner. “The partnership between FENS and SfN combines strengths and has the potential to educate the public and legislators about the importance of the brain and the burdens that diseases of the brain impose on individuals, relatives, and society.”

BUILDING CAPACITY FOR ADVOCACY

The FENS-SfN program launched in 2011 with a workshop for FENS members in Brussels, June 16-17, attended by 50 neuroscientists from 29 national societies in the region. Members of SfN’s Government and Public Affairs Committee, Bill Martin and David Kaplan, presented on elements of U.S. and Canadian advocacy, and SfN Policy and Advocacy Director Allen Segal spoke about a range of SfN advocacy tools and resources. Two keynote speakers presented on joint international and global efforts in advocacy: Mary Baker, president of the European Brain

Council (EBC), and Pierre Magistretti, secretary general of the International Brain Research Organization (IBRO). FENS members also discussed their experiences advocating for neuroscience research and participated in several strategy sessions.

Following the June meeting, FENS issued a call for grants. The grants address four main areas covered at the meeting: legislative strategy, member involvement, resource creation and adaptation, and strategic partnerships.

At Neuroscience 2011, a joint committee of FENS and SfN members met to review the grant proposals and select recipients. In December, FENS announced the first 10 grant recipients for the 2012 calendar year (see below). Details about the 2013 grants program will be announced on the FENS Web site next summer.

EXPANDING GLOBALLY

Building on the initial success of the FENS-SfN program, IBRO has expressed interest in a global advocacy program. As a result, IBRO has formed a global advocacy committee and is developing a program to support national society capacity-building for advocacy in other regions of the world. The program would be supported by SfN, IBRO, and other societies identified in coming months. ■

2012 FENS-SfN Advocacy Grant Recipients

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| Spanish Society for Neuroscience | To build public awareness around Spain’s 2012 “Year of the Brain” and educate public officials. |
| Hellenic Society for Neurosciences (Greece) | To initiate an advocacy campaign aimed at local, national, and Europarliament members. |
| Croatian Society for Neuroscience | To support the foundation of the “Croatian Brain Council,” a coalition including researchers, clinicians, patient advocates, and others. |
| Neuroscience Ireland | To organize an advocacy workshop for Neuroscience Ireland Committee and members to learn about best practices in advocacy and develop an advocacy strategy for neuroscience in Ireland. |
| Société des Neurosciences (France) | To develop a Web-based tool for policymakers to learn about the costs of brain-related diseases using a standardized set of documents specifically for advocating for support of brain research. |
| Italian Society for Neuroscience | To develop a year-long series of events supporting a competition among students on brain-related subjects. |
| British Neuroscience Association | For a series of events including a workshop on the “Policy and Politics of Neurodegenerative Diseases: Social Challenges for the 21st Century.” |
| Slovenian Neuroscience Association | To promote brain awareness and unite stakeholders on a joint set of priorities and messages to promote brain research. |
| Sociedade Portuguesa de Neurociências | To initiate an advocacy campaign aimed at the national parliament in Lisbon and national European Parliament deputies in Brussels. |
| Hungarian Neuroscience Society | To develop a program focused on specific policymakers representing Debrecen City. The city includes a major research center and is home to several prominent national policymakers. |

SfN Chapters: Promoting Neuroscience Locally

As part of its mission to strengthen the global neuroscience community, SfN supports member-driven grassroots activities through its locally organized chapters. By voluntarily forming and participating in SfN chapters, members gain access to resources for local training and outreach programs, as well as the chance to nominate graduate students and postdoctoral fellows for travel awards.

Chapters also enable members to network and share information across institutions, engage and educate their communities about neuroscience, and increase involvement with SfN.

Chapters are created and led by SfN members and exist to serve members where they live and work. Any group of members in any locality around the world is eligible to petition SfN to establish a chapter with the support and signatures of 10 regular or emeritus members. With 154 chapters in 22 countries and 47 U.S. states, there may be an active chapter near you.

SfN RESOURCES SUPPORT CHAPTERS

To help chapters achieve their missions, SfN provides approved new chapters with start-up grants to launch chapter activities. Chapters are also eligible to apply for a variety of chapter grant and travel award opportunities. The Society distributes approximately \$140,000 each year to chapters through its growing chapter grant programs.

In 2012, two new grant programs will be available to chapters. The first is aimed at supporting local mentoring and other professional development workshops, similar to those provided by SfN during its annual meeting. The second, modeled on the highly popular Grass Traveling Scientist Program, will allow chapters to host visiting neuroscientists from other parts of the country or internationally.

ENGAGING THE LOCAL NEUROSCIENCE COMMUNITY

Chapters frequently plan activities such as Brain Awareness Week (BAW) and other public outreach events, congressional lab tours in the United States, student conferences, and lectures. Each year SfN recognizes outstanding contributions of chapters through the Chapter-of-the-Year Award.

The 2011 Chapter-of-the-Year Award winner, The Lehigh Valley chapter in eastern Pennsylvania, organized a successful undergraduate student neuroscience conference and visits to the local public library and elementary schools. Their student members have been heavily involved in these and other chapter activities, including developing and maintaining a chapter Web site.

Last year, SfN's Michigan chapter hosted Brain Bee events for high school students, opened research labs to the public during BAW, and demonstrated fascinating neurophysiological experiments at local high schools and small colleges. Active student and postdoctoral members of the Michigan chapter have received SfN travel awards, as well as the Next Generation Award, which recognizes chapter members who have made outstanding contributions to public communication and outreach about neuroscience.

CHAPTERS AROUND THE GLOBE

Chapters around the world have access to the same SfN funding opportunities as U.S. chapters. Using such support, international chapters like the one in Ile-Ife, Nigeria have benefited and contributed to advancing neuroscience through innovative local activities. In addition to supporting a wide range of BAW activities at local schools, the Ile-Ife chapter offers an ongoing series of public lectures and radio programs to raise awareness about epilepsy and other topics.

SfN chapters outside the United States often work in collaboration with national societies to support common goals. For example, the Rio de Janeiro chapter in Brazil, one of SfN's newest chapters, is working with the Brazilian Neuroscience Society and the International Brain Research Organization (IBRO) to plan events in coordination with the 2015 IBRO World Congress. The three highly active chapters in Australia coordinate with the Australian Neuroscience Society on the annual International Brain Bee competitions. Members of the Buenos Aires, Argentina chapter use SfN support to help strengthen and expand activities of the Argentinian Society for Neuroscience.

Chapters are playing an increasingly vital role as partners in new and ongoing programs that support SfN's mission and members. A complete list of SfN chapters and chapter benefits can be found at www.sfn.org/chapters. ■

FAST FACTS ABOUT SfN CHAPTERS

- There are 154 chapters in 22 countries worldwide and 47 U.S. states.
- SfN distributes \$140,000 to chapters each year.
- Since 2003, SfN has awarded more than \$1 million in funding to chapters through Chapter Grants, Chapter Travel Awards, and the Grass Traveling Scientist Program.
- A total of 126 chapters have applied for or received SfN funding.
- The Professional Development Chapter Grant will support implementation of chapter professional development workshops.
- The Distinguished Traveling Scientist Program will support chapter initiatives to host domestic or international visiting neuroscientists.

SfN Science Education Focuses on Strengthening Core Programs, Innovating for New Generations

Accurate, scientifically-driven public information and science education about neuroscience is more important than ever, and SfN programs continue to grow and innovate to serve this need. This spring, along with long-standing events like Brain Awareness Week and neuroscience programming at the National Science Teachers Association meeting, SfN is preparing to launch a new platform for public engagement: *BrainFacts.org*.

As neuroscience discovery expands dramatically, public awareness and interest is growing — along with sources of potential misinformation. This makes public information and dialogue between the public and scientists crucial. Moreover, the neuroscience field seeks to foster the next generation of scientists who are passionate about expanding the pace of discovery and driving it in new directions.

To address these issues, leading SfN members already pursue neuroscience education through formal classroom teaching, teacher training, or administration; practical teaching tools and games; education theory, strategy, and practice; informal science education and outreach through institutions, SfN chapters, or individually; and by welcoming students into their labs.

Much of this member activity falls within the “informal science education” arena, where work by SfN continues to expand. SfN also pays close attention to critical issues that fall within formal education, such as recent efforts to explore incorporating neuroscience into proposed national science standards, a topic on which the organization feels it may play a constructive role.

“Since its founding, SfN has recognized that effective science education and outreach is vital to our field and to the larger human endeavor,” said Public Education and Communication Committee (PECC) Chair Jim McNamara. “As the science education and communications worlds continue to evolve very rapidly, PECC will be exploring how our programs can adapt and thrive to serve these larger goals.”

LONG-STANDING EFFORTS THRIVE, NEW INNOVATIONS ADDED

SfN outreach activities are particularly active in the spring. SfN remains a major partner in the Brain Awareness Campaign, launched by The Dana Alliance for Brain Initiatives in 1996. Each year, hundreds of Brain Awareness partners, many of them SfN members and chapters, help launch and lead fun, educational events throughout the



SfN sponsors and participates in events that encourage students of all ages to become more “brain aware.” The National Museum of Health and Medicine’s 12th annual Brain Awareness Week event drew more than 550 students from the Washington, DC area.

year. SfN plays a vital role in facilitating materials and resources for these events. Much of the activity takes place during Brain Awareness Week (BAW), which is March 12–18. Interested in taking part? Resources are available at sfn.org/baw.

Building on BAW success, SfN launched a new initiative in 2011, the Brain Awareness Video Contest, to solicit short, fun educational videos. Nearly 50 entries from contestants in 9 countries were submitted, and the breadth of topics covered — not to mention the overall creativity of the submissions — was impressive. But the real success of the contest was seeing the virtual life of the videos and their use outside usual SfN channels and in the education community through online venues like YouTube, Twitter, and Facebook. Check out the winners on SfN’s Web site.

As part of its work with science teachers, SfN has a long-standing partnership with NSTA, exhibiting at the organization’s annual meeting and hosting teacher workshops led by neuroscientists. At the 2011 NSTA meeting in San Francisco, a workshop on neuromyths and another on virtual reality were well-attended and scored highly by science teachers. This outreach means thousands of science teachers avail themselves of SfN materials throughout the year. SfN will again participate in multiple events, led by volunteers, in 2012 at NSTA’s meeting in Indianapolis. SfN also sponsors the Science Olympiad, which this year will feature neuroscience as a major theme, and invites and funds Science Olympiad and Brain Bee winners to attend the annual meeting.

In 2012, SfN will again take part in the USA Science & Engineering Festival in Washington, DC. In 2010, the inaugural event drew thousands of visitors to the National Mall for a remarkable and energizing presentation of leading science from across the life and physical sciences. SfN volunteers and staff worked busily for two days to share fun brain facts, tools, and resources.

FUTURE SCIENCE EDUCATION AND OUTREACH: NEW TECHNOLOGIES, NEW POSSIBILITIES

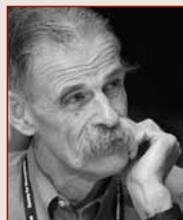
SfN is keeping a focus on the future and has launched major programming to help its outreach programs keep pace with evolving science education approaches and new communication tools. Many of the possibilities stem from *BrainFacts.org*, a public information initiative of The Kavli Foundation, The Gatsby Charitable Foundation, and SfN (see sidebar for details).

In 2011, SfN received more than \$1.5 million in funding over six years from the two founding partners to build the platform, which will launch in spring 2012. SfN's wealth of print public information materials developed over time — *Brain Briefings*, *Brain Facts*, *Research & Discoveries*, and *Brain Research Success Stories* — will have a new home on *BrainFacts.org*, with a greatly expanded global reach. Moving forward, the site will be led by an editorial board of neuroscientists (see sidebar). Newly developed public information content generated by SfN and many leading neuroscience centers will be showcased and seen by greater sets of eyes. *BrainFacts.org* also will become a new hub for science educators, with resources from SfN's NERVE database transitioning into the new site for launch. Over time, the site has the potential to build on, transform, and knit together SfN's science education activity, while also giving greater visibility to work underway in organizations across the field.

As SfN programming continues, PECC strives to balance online activity and resources, along with tools that help many members and chapters lead face-to-face engagement between science and society — including teachers, students, and the general public. At the same time, as an increasingly global organization working in a rapidly evolving communications environment, SfN is exploring how new educational approaches, communication modes, and content formats may drive opportunities for science education. Through these strategic efforts — locally, nationally, and digitally — the Society is eagerly working to transform public understanding of the brain and to light the vital spark of excitement for scientific discovery. ■

BRAINFACTS.ORG EDITORIAL BOARD MEMBERS NAMED

The inaugural editorial board members for *BrainFacts.org*, an authoritative public source for information about the brain and nervous system, began their terms January 1. A public information initiative of The Kavli Foundation, The Gatsby Charitable Foundation, and SfN, *BrainFacts.org* will launch in spring 2012. The editor-in-chief of *BrainFacts.org*, Nicholas C. Spitzer, Distinguished Professor of Biological Sciences at the University of California, San Diego, began his three-year term July 1, 2011.



Nicholas C. Spitzer, Editor-in-Chief, *BrainFacts.org*

The editorial board is composed of eight leading neuroscientists from around the globe.

Members have wide-ranging areas of expertise, spanning from molecular and cellular science to areas related to human cognition and disease, as well as across the physical and life sciences. The board will provide guidance on content development of *BrainFacts.org*,

ensuring its strong scientific validity and facilitating engagement from the scientific community. As founding editorial board members, they will be instrumental in determining the site's direction and development:

- Allan I. Basbaum, University of California, San Francisco
- Judy L. Cameron, University of Pittsburgh
- Sarah Dunlop, University of Western Australia
- Kenneth S. Kosik, University of California, Santa Barbara
- Trevor W. Robbins, University of Cambridge
- Terrence J. Sejnowski, The Salk Institute for Biological Sciences
- Edvard I. Moser, Norwegian University of Science and Technology

A World of Scientific Content in Washington, DC

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NEUROSCIENCE 2011

The Society for Neuroscience held its 41st annual meeting in Washington, DC, November 12–16, 2011, convening more than 32,000 attendees from around the world to participate in more than 16,000 scientific presentations and dozens of workshops supporting professional development and the neuroscience field.

SfN's annual meeting enjoys representation from much of the global neuroscience community. More than 30 percent of the neuroscientists who attended Neuroscience 2011 came from 74 countries outside the United States. Though the science presented came largely from countries with high concentrations of neuroscientists like Canada and Japan, a portion of the poster presentations, symposia, and nanosymposia came from neuroscientists in emerging science communities like Armenia and Mongolia. More than 70 percent of posters were from presenters based in the Americas; more than 17 percent were from presenters based in Africa, the Middle East and Europe; and more than 10 percent were from presenters based in Asia and Oceania.

The Neuroscience 2011 scientific program illustrated much about neuroscience research and neuroscientists around the world.



Robert Shiller, PhD, leading economist, Yale University professor, and best-selling author, discussed the ways human behavior drives the economy during the Dialogues Between Neuroscience and Society Lecture.

For instance, California-based neuroscientists contributed more abstracts to the meeting than any other U.S. state, and the meeting's 148 Australia-based neuroscientists traveled the farthest to present in Washington, DC. SfN's annual meeting continues to expand its reach and scope, engaging more neuroscientists from a variety of professions and across the globe.

BRINGING TOGETHER NEUROSCIENCE AND SOCIETY

Neuroscience 2011 drew both neuroscientists and the local public with three popular public events.

World-renowned economist, Yale economics professor, and best-selling author Robert Shiller opened the annual meeting with a presentation that compared trends in consumer confidence to trends in financial markets. His lecture, "Animal Spirits — How Human Behavior Drives the Economy" began with a brief history of the major economic models developed in the 20th century, including the Keynesian model, which suggests human decisions are

driven by "animal spirits." Shiller, an academic who helped develop the behavioral economics model in the 1980s, then discussed a correlation between the human psyche and 21st century financial milestones such as the Great Depression and the housing market crash.

Throughout his lecture and the question-and-answer session with leading neuroscientists, Shiller explained one of the greatest challenges facing economists is their reliance on historical evidence. Unlike neuroscientists who can develop experiments to test their theories, economists can only analyze macroeconomic trends using historical information. Without the help of neuroscience, Shiller argued, economic forecasting will continue to be guesswork.

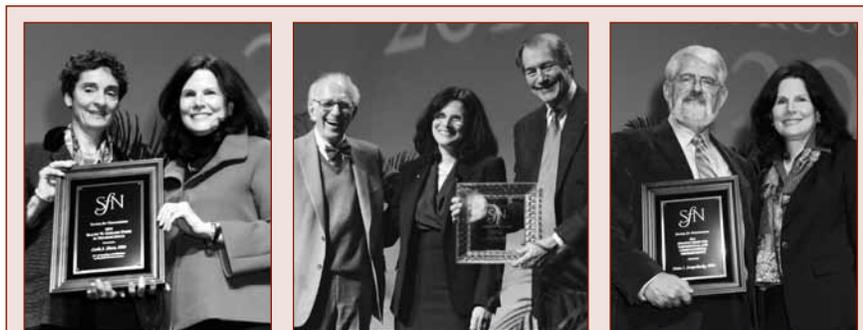
"We don't know what to do with these crises," Shiller said of economists. "We need a better understanding of neuroeconomics, taking inspiration from neuroeconomics and using it to build a better understanding of the economic model."

In the Fred Kavli Public Symposium, “The Brain on Trial: Neuroscience and the Law,” chair Alan Leshner and four experts shared how neuroscience research challenges the evidence used by the judicial system in criminal convictions. Steven Hyman spoke about addiction and the control of behavior while Adrian Raine used evidence about the biology of violence to explain how neuroscience challenges the law. The symposium also included Abigail Baird’s lecture on the neuroscience of the adolescent brain and the implications for the criminal justice system. Finally, Craig Stark explored how memory formation affects the court system.

The public also was welcome at the annual Public Advocacy Forum. During this year’s forum, “The Obesity Epidemic: How Brain Science Is Leading the Way to Better Help and Prevention,” four neuroscientists and medical professionals illustrated how brain research is being used to fight



Ann Graybiel of Massachusetts Institute of Technology presented a Presidential Special Lecture at Neuroscience 2011 about basal ganglia circuits.



(Left) Carla Shatz received the Ralph W. Gerard Prize in Neuroscience at Neuroscience 2011 for her contributions to the field throughout her career. (Center) Charlie Rose (right) accepted the SfN Public Service Award at Neuroscience 2011 after an introduction from SfN Past President Eric Kandel and Susan Amara. (Right) Amara presented Haim Sompolinsky with the Swartz Prize for Theoretical and Computational Neuroscience. To learn more about the SfN awards program, visit www.sfn.org/awards.

the obesity epidemic by informing preventative health programs. The speakers shared their insight on topics like the effects of nutrition on brain development and the relationship between obesity-related diseases and cognitive impairments, childhood obesity, and metabolism.

View Neuroscience 2011 public events at youtube.com/sfnvideo.

SCIENTIFIC LECTURES ENRICH NEUROSCIENCE PROGRAM

Past President Susan Amara selected four leading neuroscientists with a range of research specialties to deliver the Presidential Special Lectures. Mu-Ming Poo discussed the discovery of nerve growth factor, providing a retrospective view of the evolving concepts in the study for neurotrophins and highlighting recent findings on the role of neurotrophins in axon development and synaptic plasticity. Ann Graybiel explained how deep brain structures, including the basal ganglia, influence human behavior, and how the interplay between imbalance between flexibility and fixity could be related to motor and

neuropsychiatric problems. Cornelia Bargmann looked at the way genes and the environment interact to generate flexible behaviors, showing how neuronal circuits wiring in *C. elegans* is both incomplete and ambiguous because of the genetic variation, internal states, and environmental conditions regulating them. The final Presidential Special Lecture by Andrew Feinberg covered the epigenetic basis of common human disease, looking at how heritable information advances the understanding of such diseases using new technological, statistical, and epigenetic approaches.

NEUROJOBS JOB FAIR

The NeuroJobs Job Fair, a pilot effort at this year’s annual meeting, drew large crowds of attendees to meet with representatives from a dozen companies, nonprofit organizations, and educational institutions from around the world. Organizations exhibiting at the NeuroJobs Job Fair included: HHMI-Janelia Farm Research Campus, Thorlabs, St. Jude Children’s Research Hospital,

Continued on page 14...

...A World of Scientific Content, continued from page 13

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Nora Volkow, director of the National Institute on Drug Abuse, and Allen Guttmacher, director of the National Institute of Child Health and Human Development, along with four other NIH directors, addressed the media at a Neuroscience 2011 press conference.

Research In Germany, University of Tennessee Health Science Center Postdoctoral Office, NatureJobs, Surgical Monitoring Associates Inc., The Edmond and Lily Safra Center for Brain Sciences at the Hebrew University of Jerusalem, Yale University Department of Neurobiology, Center for Neuroscience and Regenerative Medicine, Impulse Monitoring Inc., and Ohio Wesleyan University.

Attendees with a variety of backgrounds learned about employment and fellowship opportunities in biomedical research, academia, photonics technologies, and more. They also had access to a series of three career-path workshops.

To learn more about SfN's NeuroJobs Online Career Center or to participate in the Neuroscience 2012 job fair, contact pdp@sfn.org.

SUPPORTING THE PROFESSION

SfN organized the annual meeting line-up of professional development

workshops to meet the needs of neuroscientists at every career stage. Some of the professional development workshops included "The Art of Networking," "Research Careers in Industry and the Private Sector," and "Time Management: Balancing Family and Neuroscience."

Workshops such as "Careers Beyond the Bench" drew hundreds of early-career neuroscientists interested in hearing about the many ways to apply graduate training in neuroscience outside of academia. The presenters reminded attendees of the networking opportunities that could lead to unexpected, but rewarding career paths beyond academia. Presentations from professionals in fields such as K-12 education and publishing helped attendees consider the transferable leadership, writing, and problem-solving skills they have acquired from their neuroscience training.

"Beyond the Bench: Supporting the Neuroscience Community Through Leadership, Outreach, and

Accumulated Wisdom" suggested to established neuroscientists how to engage in the broader neuroscience community through advocacy, public outreach, and increasing professional contributions outside of the laboratory. Senior members of the neuroscience community shared their experiences, such as working in university administration and assuming leadership roles with scientific publishers. Presenter Irwin B. Levitan, who has served in a leadership role with SfN, said "Serving your Society is a great way to serve your community because (the Society) is so good at getting things done."

NEUROSCIENCE SCHOLARS PROGRAM CELEBRATES 30 YEARS

The Neuroscience Scholars Program (NSP) celebrated 30 years of supporting underrepresented minorities (URMs) during a symposium where scholars presented research on topics ranging from how the brain manages dopamine to the mechanisms of memory impairment. The scholars had 5 to 25 years of experience since participating in the program, and all have become highly successful.

The NSP has funded fellowships, including annual meeting attendance, for more than 550 trainees and contributed to stemming the proverbial "leaky" pipeline that causes attrition of URMs in neuroscience. In a recent survey of past scholars, 87 percent of respondents reported the program had increased their commitment to a neuroscience career and 90 percent indicated the NSP helped with their career advancement.

NSP principal investigator and former NSP Scholar Erich Jarvis introduced the program and summarized its history and successes. As NSP's primary funder, National Institute of Neurological Disorders and Stroke Director Story Landis

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Neuroscience 2011 featured more than 16,000 abstracts from neuroscientists around the world.

explained why NINDS continues to support the program. SfN also premiered a video highlighting the program's achievements through a montage of interviews with selected scholars (view the video at youtube.com/sfnvideo).

"The NSP is a spectacular program and NINDS is very proud of its accomplishments," Landis says in the video. "It provides a lot of bang for the buck. It's probably the most successful diversity program we support."

Finally, SfN honored 14 individuals who have played instrumental roles in the NSP's success over its 30-year course or who have otherwise made significant contributions to the SfN goal of advancing diversity in neuroscience. Some served as past program directors for the NSP or other NIH-funded diversity programs at SfN, while others held volunteer leadership positions through which they helped to advance the Society's diversity goals. ■

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| | |
|--------|------------------------------|
| 43 | trees |
| 19,489 | gallons of water |
| 1,235 | pounds of solid waste |
| 4,322 | pounds of hazardous effluent |

DID YOU KNOW?

Top 10 Neuroscience Meeting Planner 2011 Search Terms:

1. Pain
2. Autism
3. Schizophrenia
4. Optogenetics
5. Dopamine
6. Microglia
7. Neurogenesis
8. BDNF
9. Zebrafish
10. Spinal Cord Injury

Top 10 Countries With the Most Scientific Presentations at Neuroscience 2011:

1. United States
2. Canada
3. Japan
4. Germany
5. United Kingdom
6. Republic of Korea
7. Brazil
8. France
9. Mexico
10. Italy



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