



Crafting a **MOSAIC** *in Support*
of **DISCOVERY**

FY2012 | ANNUAL REPORT



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SCIENCE in SOCIETY SCIENCE in PROGRESS

Exploring the progress and potential of neuroscience research and its impact on the world around us.

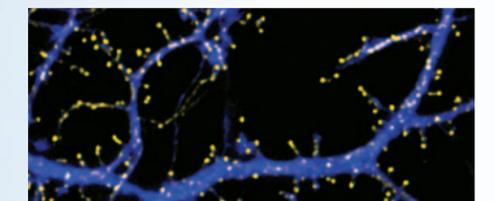


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MISSION

Advance the understanding of the brain and the nervous system by bringing together scientists of diverse backgrounds, by facilitating the integration of research directed at all levels of biological organization, and by encouraging translational research and the application of new scientific knowledge to develop improved disease treatments and cures.

Provide professional development activities, information, and educational resources for neuroscientists at all stages of their careers, including undergraduates, graduates, and postdoctoral fellows, and increase participation of scientists from diverse cultural, ethnic, and geographic backgrounds.

VISION

Guided by its mission and its values, the vision of the Society for Neuroscience (SfN) is that the next ten years should be a decade of breakthrough discovery in neuroscience and breakthrough translation of scientific advances to improve the health of people everywhere.

SfN represents the entire range of scientific research endeavors aimed at understanding the nervous system and translating this knowledge to the treatment and prevention of nervous system disorders. It fosters the broad interdisciplinarity of the field that uses multiple approaches (e.g., genetic, molecular, cellular, anatomical, neurophysiological, system, comparative, evolutionary, computational, and behavioral) to study the nervous system of organisms ranging from invertebrates to humans across various stages of development, maturation, and aging. SfN facilitates the translation of this fundamental knowledge into strategies for the treatment of nervous system disorders, including neurological, neurosensory, neurodevelopmental, psychiatric, addictive, and other related illnesses. It also encourages information transfer from the clinic back to the basic research arena. In these ways, SfN contributes to the breadth of the field of neuroscience, its highly dynamic nature, and its creative use of all the tools of modern biology to understand neural function in health and disease.

Neuroscience is a rapidly evolving field that benefits greatly from, and helps to drive, the ongoing development of powerful new tools for acquiring and analyzing experimental data. The effort to make efficient use of the staggering amounts and diversity of information known about the nervous system raises challenges that have

Promote public information and general education about the nature of scientific discovery and the results and implications of the latest neuroscience research. Support active and continuing discussions on ethical issues relating to the conduct and outcomes of neuroscience research.

Inform legislators and other policymakers about new scientific knowledge, recent developments, and emerging opportunities in neuroscience research and their implications for public policy, societal benefit, and continued scientific progress.

social, ethical, and technical dimensions. Some of these challenges are common to biomedical research in general and to its subdisciplines of bioinformatics and scientific ethics. Others are unique to neuroscience by virtue of the tremendous complexity of neural circuits and their role in controlling behavior. This entails opportunities as well as responsibilities for the neuroscience community to develop novel tools and approaches for integrating and advancing our understanding of the nervous system.

SfN will play a key role in confronting new issues as they challenge and energize the field. This will require active dialogue between SfN and federal funding agencies (NIH, NSF, and others) to define current needs and to develop strategies for meeting them. SfN's perspective on the current nature of the field and its future trajectory permeates all the elements of this strategic plan and will guide the initiatives aimed at enhancing the key scientific functions of SfN, including the annual meeting and *The Journal of Neuroscience*. This perspective will guide the ways in which SfN will strive to serve its membership and will frame the public outreach and governmental interactions of SfN.

SfN supports the open exchange of scientific information both among scientists and between scientists and the public. The Society is committed to ensuring that its published materials are scientifically accurate and are widely accessible to interested audiences. The Society seeks to ensure that its access policies and practices for information dissemination are consistent with these goals, and with the sustainability of a system requiring careful scientific review prior to publication.

VALUES

In carrying out all of its activities, the Society for Neuroscience is committed to the following:

- Identifying and serving the evolving needs of SfN members as well as the field of neuroscience.
- Actively promoting the idea that progress in understanding the nervous system depends on the honest pursuit of scientific research and the truthful representation of findings.
- Continuing to promote greater diversity of representation of women, minorities, and young investigators, along with geographic and specialty balance, in SfN's meetings, conferences, committees, and governance processes.
- Seeking new and innovative ways to utilize technology in ongoing activities to better serve members and to help manage the problems of scale as a successful association in the 21st century.
- Fulfilling its Mission in a socially, economically, and environmentally responsible fashion, including minimizing SfN's environmental footprint through energy efficiency, recycling, and other initiatives, and being mindful of the broader impact of its day-to-day practices, decisions, and actions.
- Developing effective strategic relationships and collaborative initiatives with appropriate external partners, including other scientific societies and associations, health advocacy groups, foundations, public agencies, government entities, educational institutions, corporate entities, information technology service providers, etc.
- Building a model of iterative planning into the fabric of SfN governance and management processes, incorporating regular evaluation of the impact and success of initiatives and activities, and periodic revisiting of major programs and activity clusters.



MESSAGE from the President

At a time of both unparalleled opportunity and considerable challenge in the neuroscience community, the Society for Neuroscience made significant progress in FY2012 on programs that support and strengthen the field. Several initiatives have been launched by SfN Council and committees while others are developing, creating a strong mosaic of activities that serve an increasingly global, diverse, and growing membership. A major theme of my presidency has been to emphasize advocacy and greater funding for neuroscience research.

Sustaining High-Value Programs, Establishing New Targets

SfN continues to implement successful programs that members value — one reason that membership hit another new record high of more than 42,000 members in 2012, with representation in nearly 100 countries. Those programs include a vibrant annual meeting that brings together all aspects of neuroscience research; *The Journal of Neuroscience*, which is highly respected; media outreach and advocacy initiatives worldwide; and a range of professional development programs.

At the same time, Council has identified five priority areas for the Society's strategic attention and expansion: 1) ensuring programs and services reflect *changing member demographics*, as the Society becomes increasingly young, diverse, and international; 2) exploring new options and opportunities for the *annual meeting of the future*, to stay on the leading edge of member expectations; 3) leveraging the Web for *public outreach and advocacy*; 4) *expanding professional development* for many neuroscience career paths at every professional stage; and 5) leveraging *social and Web technologies* to expand the reach and scale of SfN programs.

Key Achievements, Building for the Future

Continuing vibrant, scientific exchange within the neuroscience field was a major emphasis in FY2012. Both Neuroscience 2011 in Washington, DC, and *The Journal of Neuroscience* experienced successful years while

the organization also investigated new ways of enhancing their offerings. Outstanding science at the 2011 annual meeting drew the second largest attendance in the Society's annual meeting history, and Neuroscience 2012 plans include a new meeting mobile app and a demonstration of "dynamic posters" using flat screens. Additionally, *The Journal* remained the most frequently cited peer-reviewed journal in the field, while SfN made significant enhancements to its online and mobile access.

"A major theme of my presidency has been to emphasize advocacy and greater funding for neuroscience research."

- SfN also enhanced efforts to support the diverse and growing neuroscience community. The Society launched a new online educational resource portal that is funded by NSF and guided by a scientific editorial board. *NeurOnLine* continued to grow as a way to discuss many topics ranging from research protocols to animal research advocacy. At the annual meeting, professional development programs continued to be widely attended. The Neuroscience Scholars Program celebrated 30 years of excellence in training under-represented diverse scholars in neuroscience, and the NSF-funded Department Chair Training to Increase Women in Neuroscience project drew the participation of many department chairs and administrators.
- Public advocacy and outreach expanded globally, with novel partnerships and transformative new communications platforms. In May, I was particularly pleased to help launch *BrainFacts.org*, a public information initiative of The Kavli Foundation, the Gatsby Charitable Foundation, and SfN. With an editorial board of leading neuroscientists from four nations and nearly 1,000 resources about the brain and nervous system, the site provides an exciting and accessible global

platform for discussing the progress and promise of brain research. Both U.S. and global advocacy initiatives also expanded, including a partnership with the Federation of European Neuroscience Societies to enhance the work of national societies in Europe and worldwide.

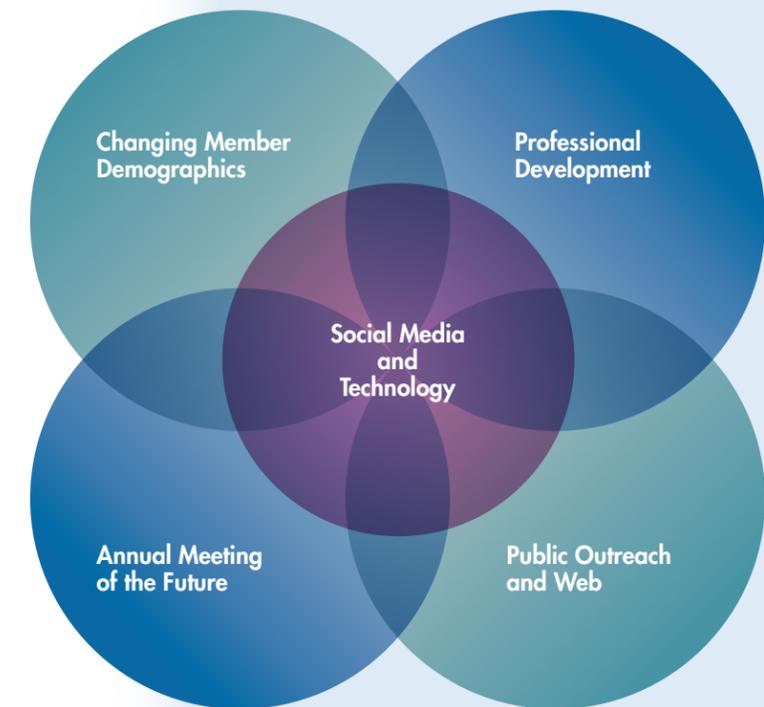
Continued dialogue with U.S. policymakers occurred through Capitol Hill visits, laboratory tours, and coalition partnerships, including Research!America, One Mind for Research, and the American Brain Coalition. The Society also engaged with the White House Office of Science and Technology Policy to discuss significant new opportunities and strategies for promoting neuroscience research. A number of leading SfN members provided ideas for innovative and interdisciplinary approaches for the future.

Addressing Evolving Needs and Challenges

The future of neuroscience is bright, with many exciting discoveries, new partnerships, and new opportunities to advance our field. At the same time, SfN is keenly aware of deep funding pressures in many nations and other hurdles facing neuroscientists. In this environment, it is especially important that the field's largest professional society is working to serve the community's evolving needs. SfN Council continues to focus on those activities where the Society can make a meaningful impact on public awareness, research funding, and the coordination of resources. Above all, SfN's strengths have been to promote communication among neuroscientists through the annual meeting, professional development, publication, education, and outreach. I thank you for the opportunity to serve as your president this year and welcome your continuing thoughts on how we can work together to advance understanding of the brain and nervous system.

Sincerely,

MOSES V. CHAO

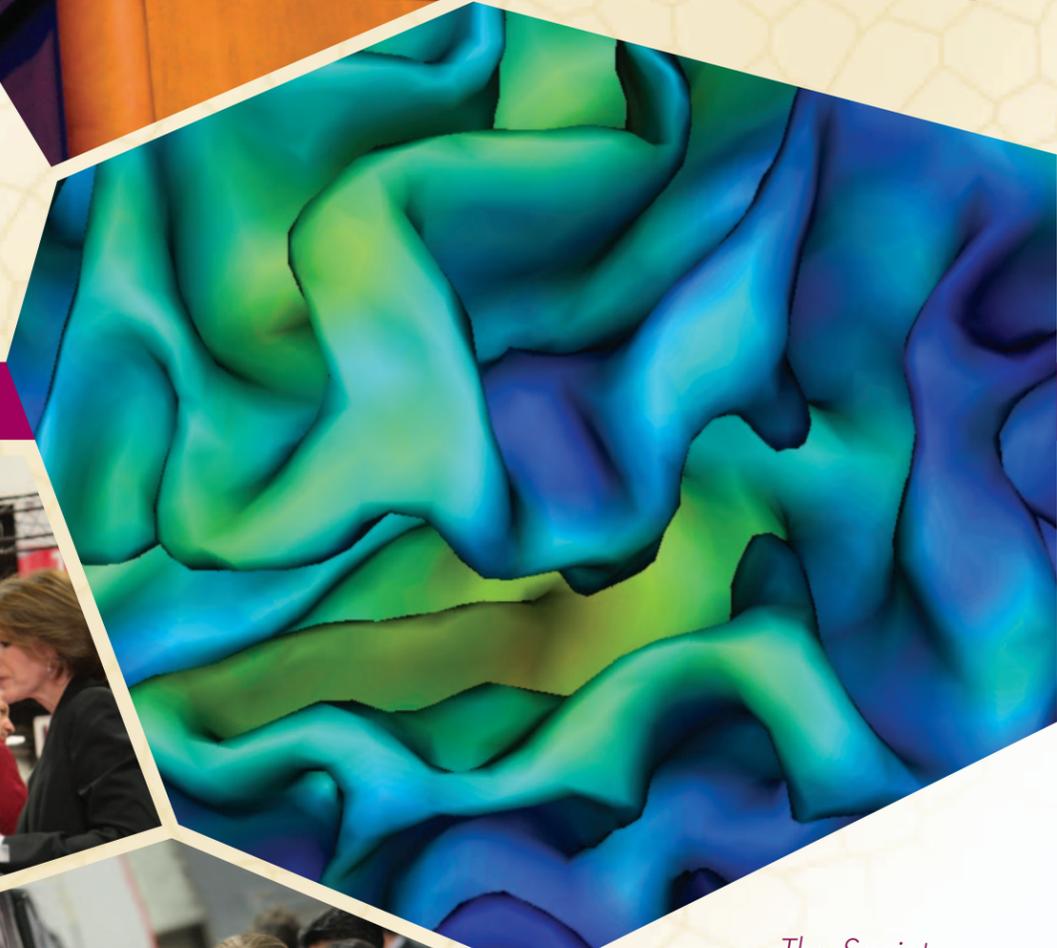


Strategic opportunities and initiatives serve a highly dynamic, diverse, and globalizing field. They take advantage of and enhance SfN's unique abilities and strengths.



Top: Mu-ming Poo of the University of California, Berkeley, and the Institute of Neuroscience, Chinese Academy of Sciences, delivered a Presidential Special Lecture at Neuroscience 2011 called "Neurotrophins: From Axon Growth to Synaptic Plasticity."

Creating Venues for GREAT SCIENCE



Above: More than 500 companies exhibited their products, publications, and services at Neuroscience 2011.

Right: More than 16,000 scientific presentations were given at Neuroscience 2011 in Washington, DC.



The Society advances the understanding of the brain and nervous system by bringing together scientists from around the world and facilitating the integration of research spanning the discipline.

Neuroscience 2011: Connecting With the Field and the Public

Washington, DC, is always a popular city for neuroscience and Neuroscience 2011 upheld the trend with the second highest annual meeting attendance ever — 32,357.

The Presidential Special Lectures ranged in topic from synaptic plasticity to the interplay between genes and the environment. Mu-ming Poo presented a retrospective view of the evolving concepts in the study of neurotrophins, highlighting recent findings on their role in axon development and synaptic plasticity. Ann Graybiel summarized evidence of flexibility in neural activity in cortico-basal ganglia circuits related to value-based decision-making and adaptive behavior. Cornelia Bargmann explained *C. elegans* research that shows how genes and the environment interact to generate flexible behaviors. Andrew Feinberg discussed the epigenetic basis of common human disease.

Rett Syndrome, the evolution of modern humans, the vestibular system, and the history of neurodegenerative diseases were the subjects of other featured lectures, which included The Peter and Patricia Gruber Lecture by Huda Zoghbi, The David Kopf Lecture on Neuroethics by Svante Pääbo, the Albert and Ellen Grass Lecture by Dora Angelaki, and the History of Neuroscience Lecture by Anne Young. Thematic special lectures ranging from basic science to clinical applications and new technologies also enriched the Neuroscience 2011 scientific program.

Held in the political heart of the United States and crossroads of public advocacy, Neuroscience 2011 drew

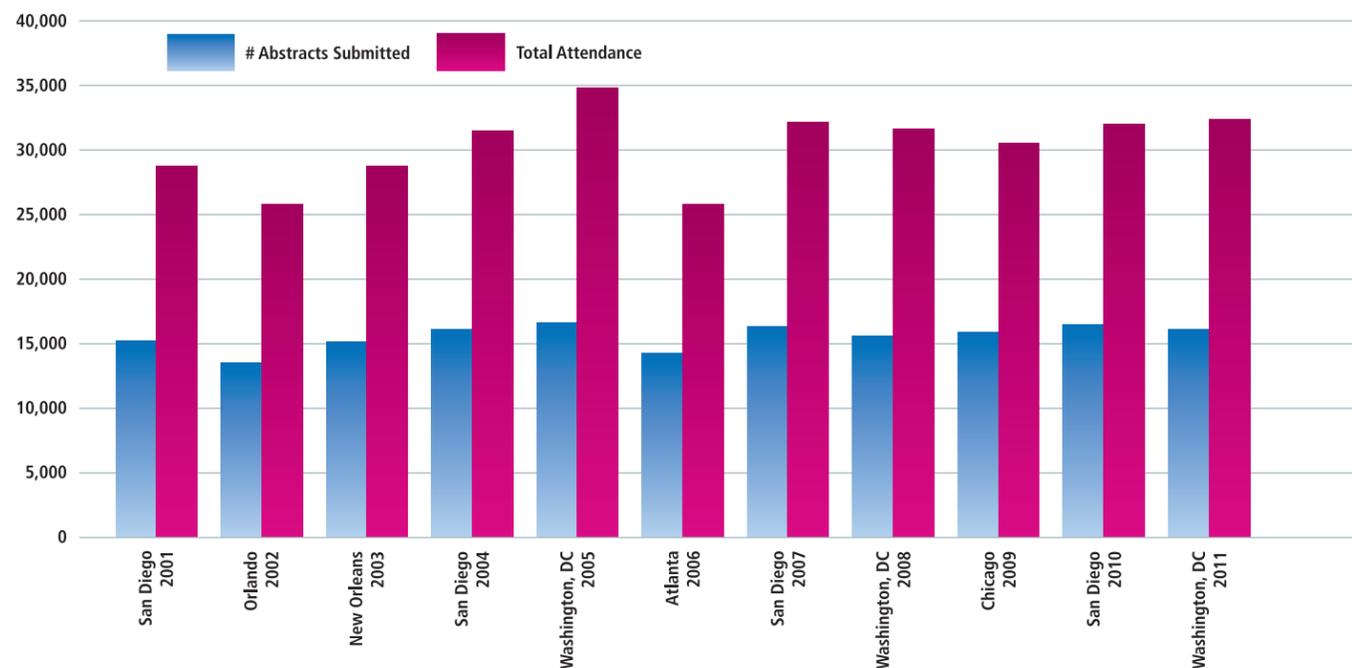
officials from both the U.S. House of Representatives and U.S. Senate for poster floor tours and opened its doors for public events. The Dialogues Between Neuroscience and Society lecture featured a timely discussion of economic decision-making by Robert Shiller. Shiller, a leading Yale economist and best-selling author, presented his findings about "Animal Spirits: How Human Behavior Drives the Economy" and engaged a panel of distinguished neuroscientists to explore the interplay between economics and the brain.

The public and neuroscientists alike learned about "The Brain on Trial: Neuroscience and the Law" during the Fred Kavli Public Symposium. The Public Advocacy Forum, titled "The Obesity Epidemic: How Brain Science Is Leading the Way to Better Health and Prevention," shared neuroscience clinical discoveries related to obesity issues, pointing to the importance of emerging discoveries for public policy.

Innovating to Serve Attendees

As part of SfN's ongoing commitment to serve the evolving needs of meeting attendees, the Annual Meeting Advisory Group, appointed by the SfN Council, initiated a survey of both meeting attendees and members who have not attended the meeting in the past five years to identify opportunities to enhance the meeting experience. The survey results will help SfN maintain and enhance the meeting's scientific dynamism and ensure successful implementation of new initiatives, particularly those involving new technologies.

Strong Science Drives Strong Attendance



Strong abstract submission numbers and the second-highest attendance in history showcased Neuroscience 2011 as continuing to provide importance and value to SfN members and the neuroscience community.

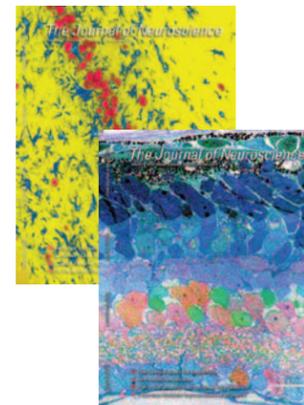
As part of SfN's ongoing efforts to increase the vibrancy and effectiveness of the meeting's scientific program, SfN prepared to hold a dynamic poster demonstration at Neuroscience 2012. A dynamic poster is a multimedia presentation displayed on a flat screen with movies, animation, digital images, and sound. The dynamic poster concept is designed to provide a different level of engagement with science. Nine volunteers from the eight themes will present a dynamic poster at Neuroscience 2012, with the intention of expanding the use of new technology and presentation modes on the poster floor in future years.

LEARN MORE:
SfN.org/am2011
SfN.org/am2012

Strategic MILESTONES

- *The Journal of Neuroscience* celebrated 30 years of scientific publishing in 2011.
- It's easier to read *The Journal* on the go with the new *JNeurosci* app for iPhone and iPad. *The Journal* website is also optimized for small screens to make it more compatible with smartphone Web browsers.
- Neuroscience 2011, held in Washington, DC, had the second highest attendance of any SfN annual meeting, with 32,357 total attendees.
- Anticipating annual meetings of the future, SfN prepared for dynamic poster demonstrations at Neuroscience 2012. Dynamic posters are multimedia presentations displayed on a flat screen with digital audio and video capabilities.

The Journal of Neuroscience: Publishing Cutting-Edge Neuroscience Research



As in the past 10 years, in calendar year (CY) 2011 *The Journal of Neuroscience* continued to be the most highly cited journal in the field of neuroscience, maintaining its position as the premier publishing platform for neuroscience research. *The Journal* expects to publish more than 17,500 pages in CY2012. It also maintained a highly selective acceptance rate of 29 percent in CY2011. *The Journal's* impact factor remains high at 7.27.

The median time from submission to first decision was 30 days and the median time from acceptance to publication was 55 days under the leadership of Editor-in-Chief John Maunsell. This fast turnaround was made possible by *The Journal's* dedicated editorial team of eight senior editors and 29 reviewing editors from nearly 30 institutions in six countries. Also crucial to *The Journal's* peer review process are the 161 associate editors.

A new mobile strategy now makes it easier to access the latest neuroscience discoveries anywhere. iPhone and iPad users can access *The Journal's* free mobile app, *JNeurosci*, which provides the current issue of *The Journal* as well

as the five most recent issues. *The Journal* experience is interactive on *JNeurosci*, with searchable abstracts and full-text articles complete with side navigation and internal hyperlinks. Devices registered with an institutional subscriber can easily browse images, article sections, and references in text and downloadable PDF formats whether the subscriber is on or off-campus. *JNeurosci* also tracks reading history and allows users to electronically share content from sections of *The Journal* with colleagues.

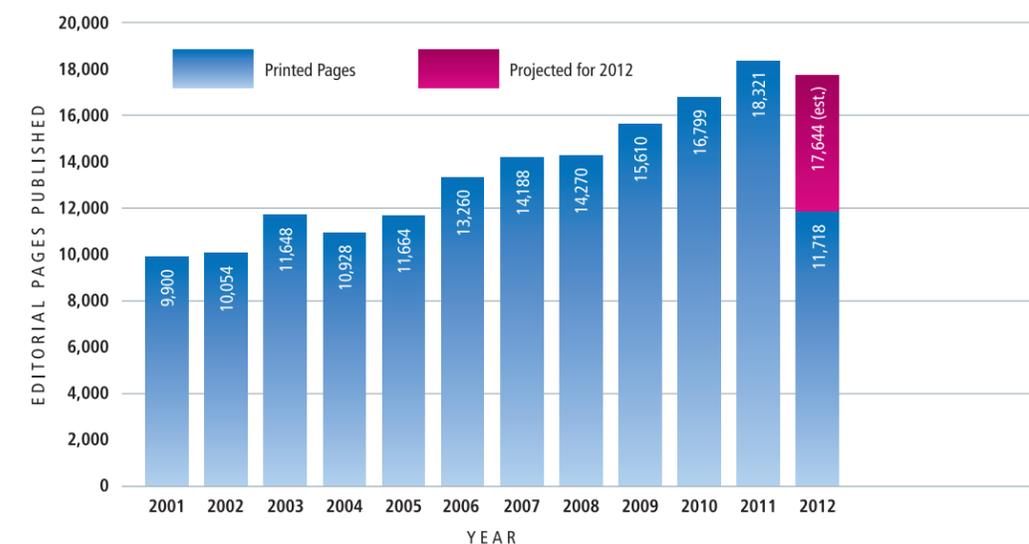
Subscribers can easily navigate every section of *The Journal* on any mobile device using its website jneurosci.org, now optimized for small screens. All *The Journal* content remains accessible to subscribers via the website, where

there is still free access to articles older than six months.

The Journal continues to provide reliable news to local, national, and international media outlets that serve a broad public. In FY2012, SfN engaged reporters around the world and nearly 7,000 media hits featured content from *The Journal*. Online coverage, which constituted the majority of media coverage, included *Yahoo! News*, *The Examiner* in Canada, *The New York Times*, *The Wall Street Journal*, *MSN Canada*, *Discovery*, *ABC* in Australia, *Top News Arab Emirates*, *Irish Medical Times*, and *The Independent* in the United Kingdom.

LEARN MORE:
jneurosci.org

Editorial Pages Published From 2001–2012 (Projected)



The Journal is projected to publish more than 17,500 editorial pages in 2012, demonstrating its stable reputation as a premiere venue for scientific publishing.

A Window into Human Behavior

Understanding the drivers behind individual and group decision-making may lead to insights into the economy.

In 2008, the markets crashed, sending economies worldwide into a tailspin. While economists had noticed fluctuations in certain sectors, according to Robert Shiller, an economist from Yale University, no one actually had predicted the fall. During “Dialogues Between Neuroscience and Society,” SfN’s annual presentation highlighting the ways brain research touches the human experience, Shiller turned to the language of neuroscience to discuss these events.

As described in his book, *Animal Spirits: How Human Behavior Drives the Economy*, Shiller pointed out

that economics is not just a rational endeavor. It is also driven by what John Maynard Keynes called “animal spirits” — internal drives that govern much of human behavior.

Neuroscience is starting to shed some light on the brain-based factors that affect economic behavior, sparking a subfield called neuroeconomics. The focus of this subfield is the science of individual and group decision-making. A growing body of research in neuroeconomics is helping to identify the connections between financial behavior and brain activity.

For example, Shiller described a recent study in the *Journal of Economics* that measured brain activity during an economic exercise. When “shareholders” were told of the possibility of an unexpected financial windfall — a special dividend — brain imaging showed a spike in neuronal activity. Yet when the shareholders received the actual reward, no response was observed. This finding suggests expectation is a driver of economic behavior. Shiller noted that when animals are presented with the possibility of a reward, they, too, will do what they need to receive it.

Research suggests another driver of economic behavior is personal outlook. The more optimistic people felt about the economy, the more likely they were to spend money



Economist Robert Shiller discussed how human behavior drives the economy during the “Dialogues Between Neuroscience and Society” lecture at Neuroscience 2011.

and accumulate debt. As soon as confidence declined, so did the spending.

Hormones on the Trading Floor

What can neuroeconomics tell us about the decisions stock traders make as they move in to close a deal? During a small study conducted at the University of Cambridge, Shiller explained, researchers measured the hormone levels of 17 young male traders to see how they corresponded to behavior. Specifically, the researchers looked at testosterone, the male sex hormone linked to aggression, and cortisol, a hormone secreted during stress. Their findings provided a glimpse of the relationship between physiological responses and financial actions.

The hypothesis guiding the study was that the higher a trader’s testosterone levels were at the beginning of the day, the more

money he would make. Similarly, the researchers believed cortisol levels would rise if the day’s trading resulted in above-average losses.

The results of the study did show a positive correlation between testosterone and profits. Cortisol, however, rose not in the face of actual losses but in anticipation of market volatility and the prospect of increased profits. Researchers believe that for a period of time, elevated cortisol can result in increased motivation and focus.

Sometimes, however, there can be too much of a good thing. The study suggests that if both testosterone and cortisol levels remain high, the two hormones could work in opposition to each other, with testosterone promoting risk-taking and cortisol leading to risk-averse behavior. Receiving these conflicting signals may make it difficult for traders to conduct sound risk assessments.

Linking Behavior to the Economy

Clearly, such behaviors can have an impact on the world economy. The question, however, is how much of an impact. Dialogues panelists Wolfram Schultz, a neuroscientist from the University of Cambridge, and Antonio Rangel, a neuroeconomist from the California Institute of Technology, had a lively discussion about this issue, with Shiller and SfN President Susan Amara pointing out a couple of possible scenarios.

Schultz suggested that perhaps a relatively small number of people made the risky decisions that led to the crash, and others followed suit because of herding behavior. Alternatively, Rangel speculated that an aggregate of individual decisions moves the system along, resulting in booms and busts.

At this point, whether the economy is driven by one — or both — of these scenarios is unclear. “We can’t conduct controlled experiments in economics,” concluded Shiller. “No government in the world would let us raise interest rates in one country and compare its behavior to countries with lower rates. Therefore, what’s called for now is more research about individual decision-making and how individuals interact in the economic arena,” he said.



Researchers study stock traders to determine the brain’s link to economic decision-making.

GROUP THINK: The Science of the Social Brain

Social neuroscience is helping shed light on the powerful link between biology and behavior.

What are the drivers behind human interactions in social situations? How do people behave in groups? Can biological responses and processes provide clues about how people make choices in the financial arena? The growing field of social neuroscience focuses on questions such as these and has made headway in explaining the complex relationship between biology and behavior.

Understanding how people process social information is an important area of research for social neuroscientists. Brain imaging studies show people respond differently to other members of their own social group than to outsiders. This research supports the importance of social information in how people interact with the world around them.

Other research indicates social

interactions may be rewarding, especially among women. Neuroscientists used functional magnetic resonance imaging (fMRI) to scan women's brains while they played a collaborative game. When players cooperated, the researchers observed activation in parts of the brain related to reward — the nucleus accumbens, caudate nucleus, ventromedial frontal/orbitofrontal cortex, and the rostral anterior cingulate cortex. Later studies conducted with men had a slightly different result. Their reward pathways were more activated when they had an opportunity to punish players who were cheating. Similar research is examining the benefits and biological underpinnings of the social concepts of generosity, empathy, and social justice both in people and in animals.



Like humans, savanna baboons suffer from anxiety and stress based on their social standing in the group, which often has adverse health effects.

learning and memory. Chronic stress also has been linked to an array of diseases, including high blood pressure, hardening of the arteries, and abdominal disorders.

Studies with savanna baboons are helping researchers better understand social stress. Like people, baboons live in social groups and spend plenty of time interacting. Many of these interactions generate stress, much of it built around competition for social rank.

In general, among baboons in a stable dominance hierarchy, lower ranked animals are more stressed, indicated by increased levels of stress hormones. And while higher ranked baboons are generally more relaxed than those ranked below them, alpha males are the exception — they are markedly more stressed than their peers.

Rank is not the only factor that determines stress levels in baboons. Personality matters as well. Those that are isolated or perceive even benign social activities, such as a rival sleeping nearby, as a threat are more stressed — and less healthy overall.

Social neuroscience studies like these are helping to uncover why we behave the way we do. Although still a relatively new field, social neuroscience is illustrating the inextricable connection between the brain, the mind, interpersonal interactions, and the body.

The Social Hormone

Brain chemistry plays a role in modifying social behaviors. Researchers found that the hormone oxytocin is important in some social behaviors. Released by the pituitary gland, oxytocin has long been known for its involvement in childbirth and in helping mothers bond with their babies. Its impact on social behaviors, however, has only recently become apparent.

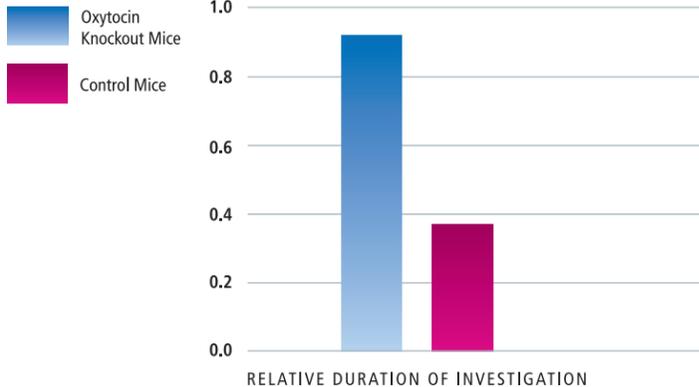
One study found mice unable to produce oxytocin could no longer recognize mice they had previously encountered. But when oxytocin was injected into the amygdala, the part of the brain responsible for processing this kind of information, the mice's ability to engage socially was restored. Another study reported children with autism have decreased levels of oxytocin. Although the causes of autism are varied and complex, this suggests oxytocin may play a role.

Building on this work, other researchers showed oxytocin increased trust in a financial situation. In a game that tested trust, participants who sniffed oxytocin invested more money than those who sniffed an inactive substance. Furthermore, brain imaging studies suggest that even after their trust had been violated, investors who had sniffed oxytocin showed no signs of fear, and they did not decrease their investments. Economic decisions, decisions made by individuals in a social setting, and decisions made by groups are all studied by social neuroscientists.

Stress in Everyday Life

Neuroscientists also monitor the effects of social constructs, such as socioeconomic status, and chronic stress. Research has shown that living in a state of chronic stress can impair the hippocampus, which is key for

Exploration of Familiar Mice

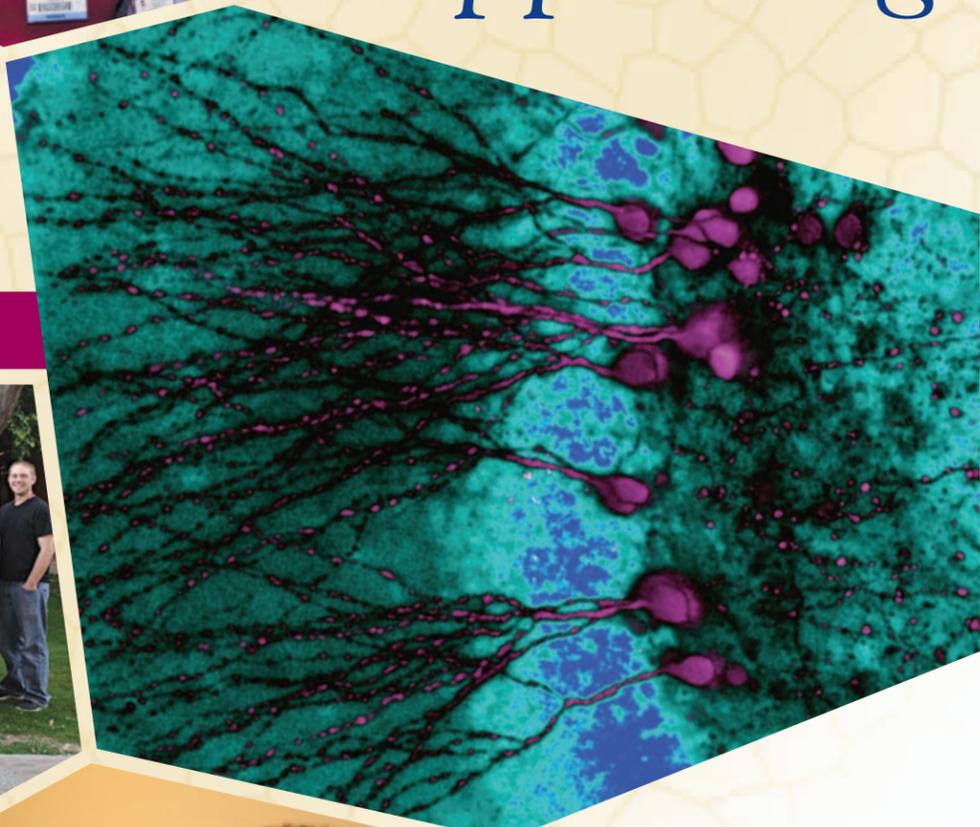


Mice normally lose interest in mice they have met before, spending less time sniffing or investigating them. However, mice without oxytocin (oxytocin knockout mice) fail to recognize the familiar mice, exploring them more than control mice do. This suggests oxytocin plays a role in social engagement.



Top: SfN supports professional development for neuroscientists across a range of career stages, paths, and transition points.

Supporting *the* Neuroscience COMMUNITY



Above: Members in Tempe, Ariz. established a new chapter, joining the network of 152 SfN chapters around the globe.

Right: Joanne Berger-Sweeney, the Professional Development Committee co-chair, helps celebrate the 30-year anniversary of the Neuroscience Scholars Program.



To meet the demands of busy, tech-savvy, and international members, an SfN focus in the future will be new online resources, leveraging SfN chapters and building partnerships with organizations globally.

Membership and Chapters: Building Value for a Growing Global Community

SfN's strong and growing membership reflects the dynamism, diversity, and global reach of the field, as well as SfN's continued success in delivering compelling value to its members. Membership has increased by more than 50 percent in the past decade. In 2011, membership grew by 3 percent to a record 42,576 members in nearly 100 countries. Students and post-doctoral fellow members increased by 6 percent in 2011 to comprise 42 percent of all members, while members residing outside the United States grew to more than 38 percent. Institutional Program membership also increased in 2011 by 10 percent to 188 neuroscience departments and programs.

SfN continues to monitor the pulse and evolution of the field as reflected in its growing and changing membership. The results are being used to align the Society's strategies, programs, and services to meet member needs in innovative ways now and in the future.

Translating Feedback Into Action

Based on findings from member surveys and other research, a Council-appointed working group drafted a strategic vision, desired outcomes, and action plan to address the priority needs of members, aimed at raising awareness and engagement of members and increasing membership value.

Additionally, supporting the next generation of neuroscientists is key to SfN's mission. Given the significant

number of student and postdoctoral members, Council created an advisory group of trainees to provide guidance on issues of concern to young scientists. The group has begun its work and will present recommendations to Council in FY2013.

Acting Globally and Locally

SfN continued to be attentive to creating greater value for its significant and growing international membership and ensuring that geographic diversity is reflected in SfN's volunteer leadership. In 2012, there were 2 percent more non-U.S. members serving on SfN committees and Council than in 2011, and SfN's international members are participating across the Society's numerous programs and initiatives.

SfN chapters continue to play a vital role in advancing the mission of the Society. With 152 chapters in 22 countries and 47 U.S. states, SfN enables members to engage locally to network, share information, educate communities about neuroscience, and participate in local advocacy. To support these initiatives, the Society awarded more than \$120,000 in chapter grant funding in FY2012. Additionally, the new Distinguished Traveling Scientist Program allows chapters to host high-caliber guest lecturers, while the new Professional Development Chapter Grants Program supports the implementation of chapter-organized career development workshops and other activities.

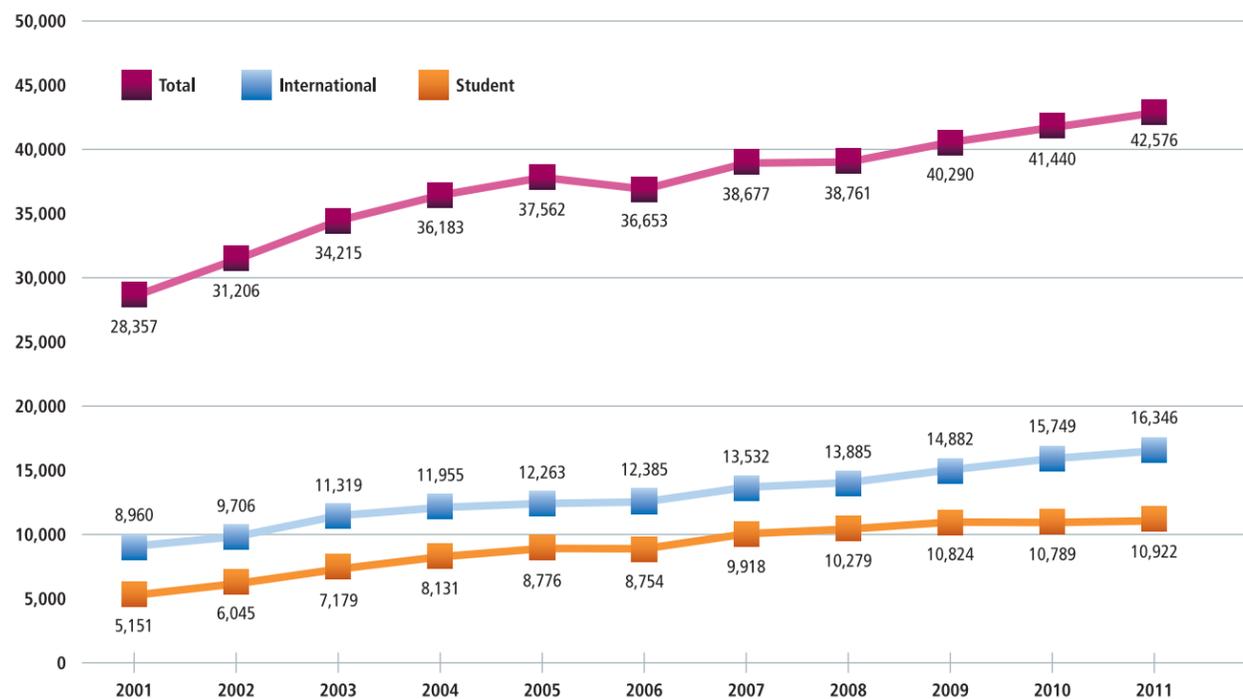
At Neuroscience 2011, the fifth annual Chapters Workshop drew a record turnout and offered best practices and tools for science advocacy in local communities. The Lehigh Valley Chapter was recognized as the 2011 Chapter-of-the-Year for its outstanding achievements in public outreach and education. The Next Generation Award went to student members of the Greater New York Chapter for excellence in public communication and education.

LEARN MORE:
SfN.org/membership
SfN.org/chapters



The Lehigh Valley Chapter hosted an event for the public during Brain Awareness Week 2012 at the Da Vinci Science Center in Allentown, Penn.

Diverse and Evolving Membership Shows Consistent Growth



SfN's membership continued to grow in 2011, with a record-breaking 42,576 members in nearly 100 countries.

Professional Development: Supporting the Career Lifecycle

In 2011, SfN put its new professional development strategic plan into action, adding new opportunities for learning and career development and laying the groundwork for future programming. To meet the demands of busy, tech-savvy, and international members, SfN will focus in the future on new online resources, leveraging SfN chapters and partnering with organizations globally.

Expanding Career and Online Resources

Professional development workshops at Neuroscience 2011 covered an

expanded array of topics including the art of networking, careers beyond the bench, and negotiating a senior position. The mentoring roundtable drew more than 200 participants, while SfN's first career fair featured representatives from organizations around the world.

Beyond the annual meeting, SfN established a new grant program to support local professional development initiatives, and the enhanced NeuroJobs Online Career Center was launched to offer users a more robust job bank and serve as the future home for multimedia

career-related resources.

NeurOnLine, SfN's members-only online community, serves neuroscientists worldwide as a venue for real-time discussions and networking, allowing members to advance their science. Active discussions are taking place, with nearly 12,000 subscribers in at least one of the more than 30 sub-communities. The mentoring program on *NeurOnLine* grew to include nearly 600 mentors and mentees, and the feature will be used to offer a new annual meeting mentoring program for Neuroscience 2012.



SfN's first career fair featured representatives from organizations around the world. Participants used the fair to explore options for their next career move and engage in face-to-face meetings with potential employers.



Above: A panel of editors representing the world's top neuroscience journals, including *The Journal of Neuroscience*, discussed responsible scientific communications at the International Brain Research Organization World Congress in Florence, Italy. Left to right: Nancy Ip, Stephen Lisberger, Jean-Marc Fritschy, Atsushi Iriki, John Maunsell.

Below: A breakout discussion group during the SfN-Chinese Neuroscience Society Workshop on "Responsible Scientific Communications" at Peking University in Beijing.



“Training and career development opportunities for the global neuroscience community remained active both at the annual meeting and beyond.”

Broadening and Training the Neuroscience Workforce

The SfN Neuroscience Scholars Program, a highly lauded and effective program funded by the National Institute of Neurological Disorders and Stroke, celebrated its 30th anniversary in 2011. This multifaceted program for U.S. underrepresented diverse trainees benefited 56 scholars in FY2012, bringing the total to more than 550 participants over 30 years.

Recruitment, promotion, and fostering productive work climates for women and underrepresented diverse faculty remained a top SfN priority through the NSF-funded

Department Chair Training to Increase Women in Neuroscience project. Leaders from 23 institutions attended workshops this year and the project concludes next year with a meeting of 43 participating institutions and dissemination of lessons learned.

Neuroscience faculty now have a rich new supply of high-quality teaching material with the launch of Educational Resources in Neuroscience, an online community-based Web portal of catalogued and reviewed resources. Launched last spring and funded by NSF, the portal already contains hundreds of syllabi, lab exercises, textbooks, and other resources contributed by SfN

members. The site was previewed at the Annual Spring Conference of Neuroscience Departments and Programs, which focused on “Sustaining Training Program Vitality During Challenging Times.”

Supporting Training Around the World

Training and career development opportunities for the global neuroscience community remained active both at the annual meeting and beyond, and SfN offered them with strategic partners around the world:

Latin America: Fifteen competitively selected young investigators from Latin America received

training via the eighth Ricardo Miledi Neuroscience Training Program, held in Argentina, with funding from The Grass Foundation.

Europe: The third Federation of European Neuroscience Societies (FENS)-International Brain Research Organization (IBRO)-SfN Neuroscience School was held in Italy for 30 students and postdoctoral fellows from throughout Europe.

Africa: Twenty-nine African university-based neuroscience educators took part in the fourth “Teaching Tools in Neuroscience” workshop, a collaboration with IBRO.

Asia: SfN participated in a joint international symposium at the Japan Neuroscience Society annual meeting on the topic of neuroscience higher education and training. In a new collaboration with the Chinese Neuroscience Society (CNS), SfN conducted a workshop on responsible scientific communications in Beijing for 52 graduate students and junior faculty from throughout China. Responsible

scientific communications was also the topic of SfN-organized symposiums at the IBRO World Congress, which featured top neuroscience journal editors, and at the CNS annual meeting.

Recognizing Scientists

Recognizing and fostering scientific excellence remains a top goal for the Society. In FY2012, 134 individuals received scientific awards and prizes, fellowships, and travel awards. Recognition included outstanding research and career achievements, the promotion and mentoring of women in neuroscience, recognition for young scientists, and science education and outreach. Dozens of travel awards supported the attendance of promising young and diverse scientists from around the globe at the annual meeting.

LEARN MORE:
 SfN.org/pd
SfN.org/awards



BACs, TRAPs, and Targeted Mutations: Revealing Secrets of the Mammalian Brain Using Advanced Genetic Approaches was the topic of a short course at Neuroscience 2011 where David Ginty presented.

Strategic MILESTONES



- SfN membership reached a new record of 42,576 members in FY2012, with membership 50 percent larger than a decade ago. Thirty-eight percent of SfN's members live outside of the United States.
- To serve the professional development needs of an evolving membership, SfN awarded more than \$120,000 to chapters in grants and other funding. The awards included funding for the new Distinguished Traveling Scientist Program and the Professional Development Chapter Grants Program.
- The Educational Resources in Neuroscience portal launched, containing nearly 600 syllabi, lab exercises, textbooks, and other resources that SfN members can contribute to and rate.
- The Neuroscience Scholars Program celebrated 30 years of advancing the careers of underrepresented diverse trainees.

CONFRONTING Attention Deficit Hyperactivity Disorder

The growing prevalence and cost of ADHD calls for research to better understand the disorder.

Most of us can remember a classmate who could never sit still. If he wasn't getting up and pacing the room, he was tapping his pencil on the desk or kicking his feet. And then there was the one who sat in the corner, daydreaming and looking out the window. She never disrupted the class, but when called on to participate, she might not know what was going on.

Today, both of these children might be evaluated for ADHD. First diagnosed 100 years ago, the disorder is characterized by excessively inattentive, hyperactive, or impulsive behaviors. Symptoms include having trouble focusing, interrupting conversations or activities, and missing important social cues.

In recent years, the diagnosis of ADHD has become common.

Between 5 and 8 percent of school-aged children in the United States have been diagnosed, with boys outnumbering girls nearly three to one. About 60 percent of children diagnosed with ADHD will continue to show symptoms well into adulthood. ADHD is prevalent in many other industrialized nations as well. Recent studies suggest that the prevalence in Canada and Europe is comparable to that in the United States. This becomes particularly evident when those countries use similar diagnostic criteria.

Regardless of location, ADHD also comes with a steep economic price. Based on a 5 percent prevalence rate, recent estimates indicate ADHD costs between \$32 billion and \$56 billion each year in the United States alone.

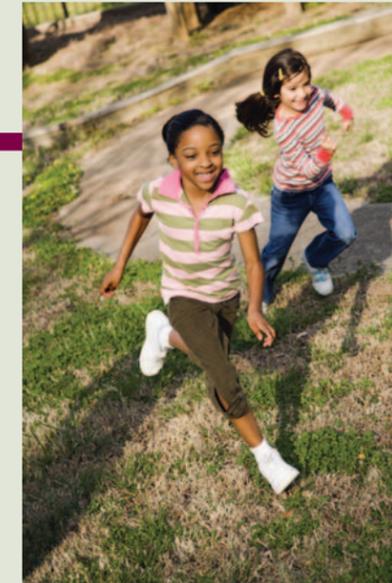
Potential Causes

Researchers are learning more about what causes ADHD. Twin and family studies show that ADHD has a strong genetic influence. One study found that more than 25 percent of parents with ADHD had children with the disorder.

Genes involved in the transmission of the neurotransmitters dopamine and norepinephrine have been implicated. In addition, recent imaging studies have shown reductions in the transmission of these so-called catecholamine neurotransmitters in at least some people with the disorder. Because prefrontal brain circuits, which are normally involved in cognitive control, require an optimal level of catecholamine stimulation, reduced catecholamine transmission could potentially lead to the weakened regulation of attention and behavior in ADHD.

Altered brain activity also has been observed in circuits connecting the cortex, striatum, and cerebellum, particularly in the right hemisphere. Recent studies show a delay in cortical development in some children with ADHD, although most individuals with ADHD do not outgrow the disorder as they mature.

Children with ADHD often have cognitive deficits as well. Research has shown that many people with ADHD have difficulties with executive functioning, which



While some high-energy behavior is normal for healthy children, behaviors that disrupt daily life can be a warning sign for ADHD.

ADHD. Currently, between 4 and 6 million children in the United States take one of these medications, which reduce hyperactivity and impulsivity, help improve the ability to focus, and even improve physical coordination. In fact, medications are so effective in helping people with ADHD that a recent shortage wreaked havoc for many families.

Nonetheless, many parents express concern about giving their children a drug that is potentially addictive. Cocaine and methylphenidate, the active ingredient in Ritalin, act similarly to inhibit their brain targets, the catecholamine transporters. Further, many wonder whether ADHD is overdiagnosed, leading to the diagnosis and treatment of high-energy children who have difficulty in the classroom, but are medically normal.

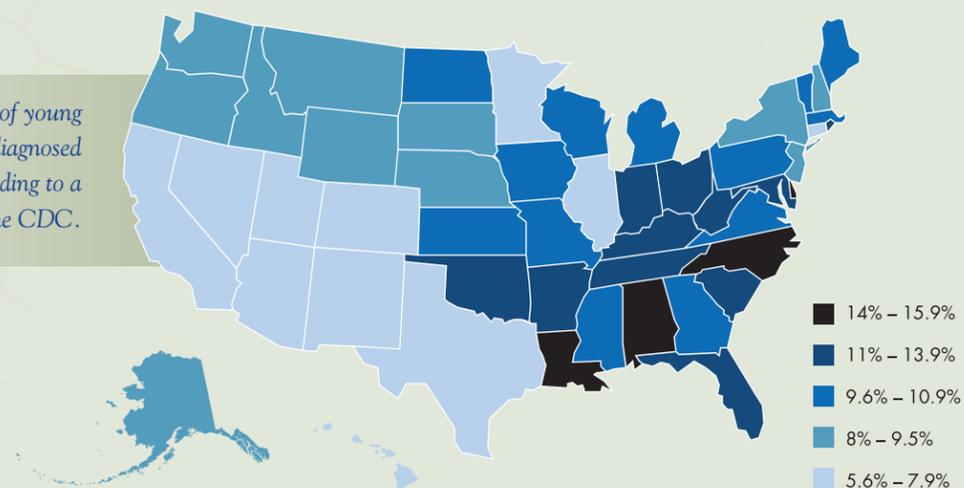
Only better understanding of ADHD and the medications used to treat it will answer these concerns. Many researchers are pursuing this path, studying ADHD's underlying mechanisms and working toward developing new tools for managing and deepening knowledge of this increasingly common disorder.

includes the ability to maintain and manipulate information in the short term, as well as planning and motor control. Particular deficits have been reported in processing visual-spatial information. This can translate into specific academic issues, such as difficulties with math skills related to geometry, difficulty reading maps, and problems with spatial relations.

Treatment Options

Treating ADHD often includes behavioral and pharmacological approaches. On the behavioral side, children can be taught strategies for staying on task, such as following a detailed schedule, or for organizing materials. Sometimes a physician determines that behavioral support is not enough. Many children with ADHD may also need medication. Since the late 1960s, stimulants such as Ritalin® or Adderall® have been prescribed to treat children with

More than 5 percent of young Americans have been diagnosed with ADHD, according to a 2007 survey by the CDC.



BRAIN CHEMICAL TRANSPORTERS:

*Solving
the Ritalin Paradox*

Studying dopamine transporters has helped solve the mystery of why stimulants have a calming effect on people with attention deficit hyperactivity disorder.

For decades, researchers have been studying attention deficit hyperactivity disorder (ADHD), but identifying the scientific underpinnings of the disorder has been challenging. In recent years, painstaking research at the molecular and cellular level has yielded important new insights.

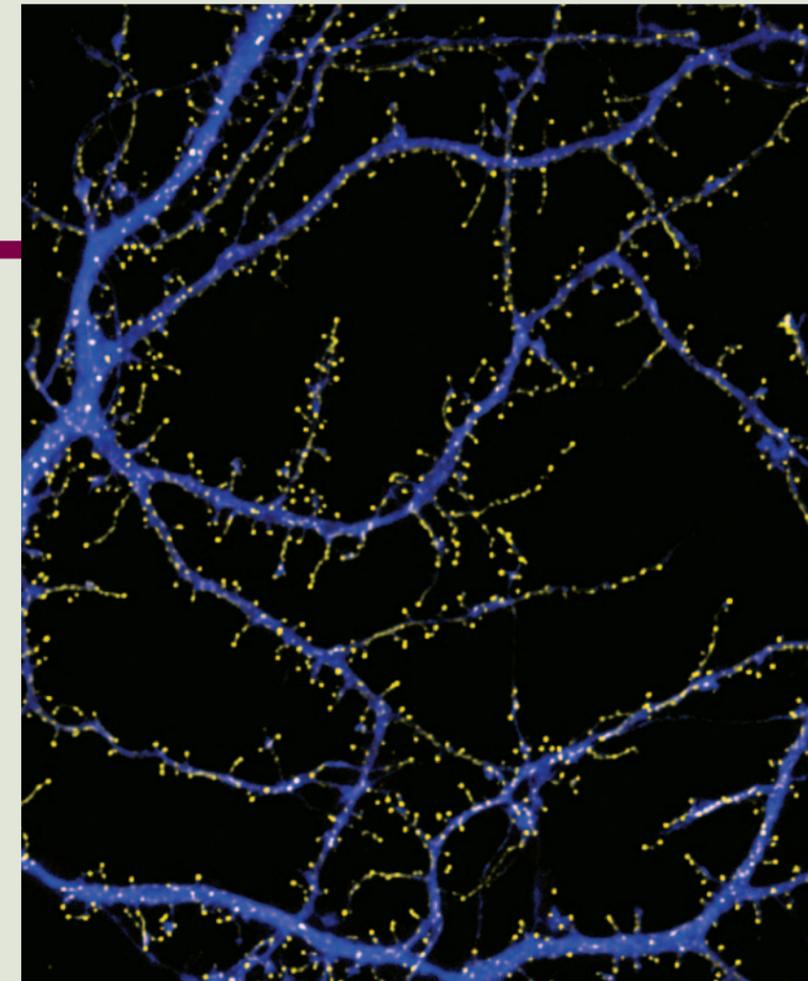
What has been particularly puzzling is why stimulants such as methylphenidate (Ritalin®) have a calming effect on people with ADHD — the so-called Ritalin paradox. Interestingly, studying addictive drugs such as cocaine has helped answer this question. That's because cocaine and methylphenidate are quite similar. Research has shown that cocaine and other stimulants block cells from disposing of dopamine, a brain chemical that produces pleasurable feelings.

How does dopamine work? During pleasurable experiences, it is released into the synapse, the space between communicating brain cells. It then binds to receptors in the receiving cell that specifically recognize and respond to dopamine. In the sending cell, the dopamine transporter is responsible for the re-uptake and storage of the extra dopamine in the synapse. Cocaine blocks the transporters, causing dopamine to accumulate in the synapse.

This finding opened the door to a new research path. Research by SfN Past President Susan Amara made studying dopamine transporters in depth possible. Amara and her colleagues figured out how to clone the gene for another transporter, for the brain chemical norepinephrine. This breakthrough allowed Amara and others to identify and study the genes for many other neurotransmitter transporters, including the dopamine transporter. Now, researchers could study how drugs interact with transporters, how the transporters function under different conditions, and how they are regulated. They could also create mice without any transporters at all.

Calming hyperactivity in mice

The role for dopamine transporters in the Ritalin paradox became clear once researchers in Marc Caron's laboratory began studying their function in "knockout" mice — mice bred to lack dopamine transporters. Studies showed these mice were unable to clear dopamine. Behaviorally, the mice were hyperactive, much like children with ADHD. At this point, the relationship between dopamine and ADHD began to emerge. It was further clarified when the researchers gave the knockout mice cocaine or amphetamines. As



Brain chemical transporters, like the one for glutamate shown in yellow, may be important in human health and disease, including ADHD.

The study suggested that people with ADHD have lower levels of both dopamine receptors and transporters than other healthy adults.

Recently, researchers in the laboratory of Randy Blakely, one of Amara's early collaborators, identified a change in the gene sequence of the dopamine transporter associated with ADHD in people. Research showed this genetic change altered the distribution and function of dopamine transporters in cells. This research brings us one step closer to understanding the cellular and molecular underpinnings of ADHD.

Viewed together, this body of work is beginning to make the case that ADHD is the result of impaired function of the dopamine system. Beginning with Amara's initial basic science investigation of transporter function, researchers are getting closer to identifying how ADHD affects the brain and why a stimulant is an effective treatment. This research may one day identify medications that can better target this system, easing problems associated with ADHD.

with many children with ADHD who take Ritalin, the drugs calmed the rats down, suggesting that without dopamine transporters, stimulants behave quite differently.

Further investigation, however, raised the concern that knockout mice were too far removed from children with ADHD, who did not lack dopamine transporters, to be a good research model. To address this issue, scientists made "knockdown" mice, mice that made fewer dopamine transporters. Although not as impaired as the knockouts,

the knockdown mice were also hyperactive. And similarly, stimulant drugs calmed the knockdown mice. This study provided additional evidence of the connection between hyperactivity and the dopamine transporter.

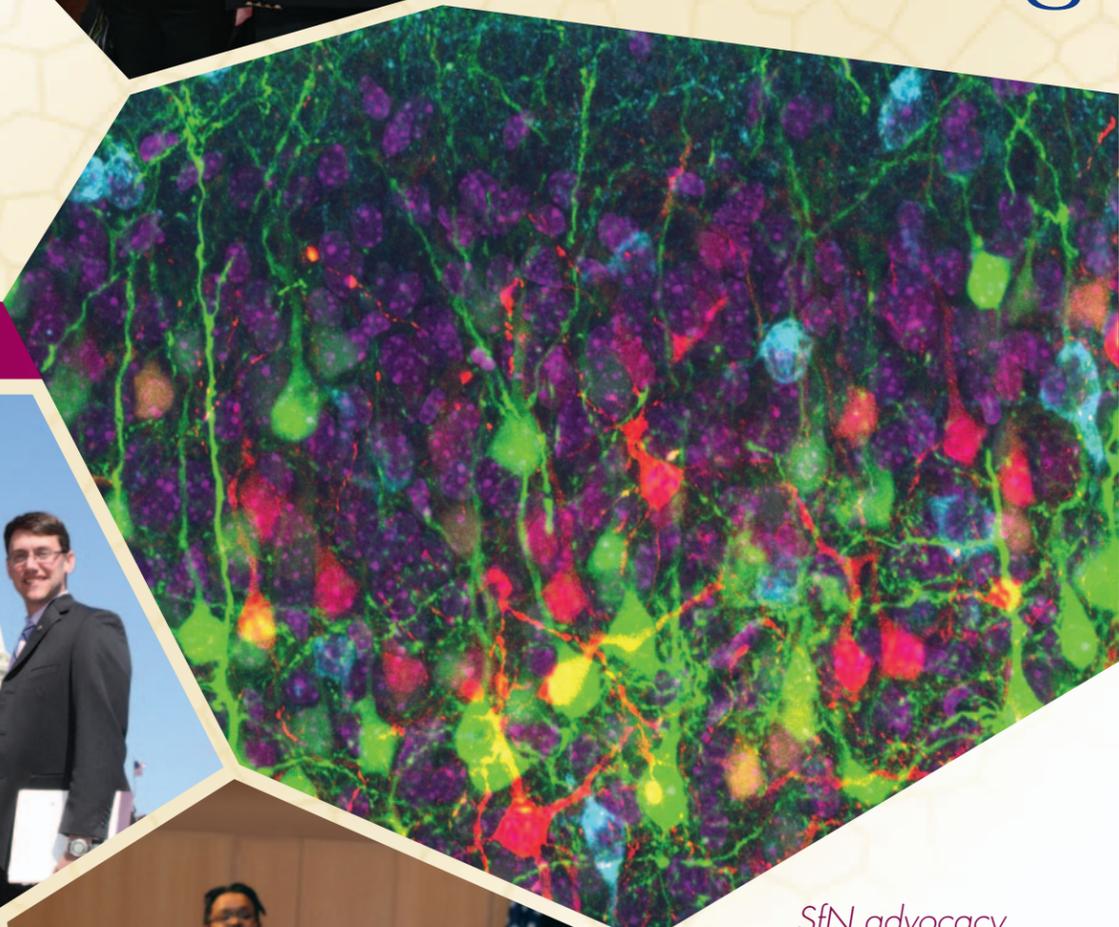
Research extends to humans

Research in people has validated these mouse studies. Using positron emission tomography (PET) scans, researchers compared brain activity of adults with and without ADHD.



Top: Capitol Hill Day brought neuroscientists to Washington, DC, to talk with representatives about the need for science funding. Left to right: Bill Mobley of University of California, San Diego; SfN President Moses Chao; and Rep. Brian Bilbray (R-CA).

Educating *and* Engaging *the* PUBLIC



Above: SfN members visited more than 70 congressional offices during Capitol Hill Day 2012.

Right: SfN co-sponsored the 2012 Washington, DC, Brain Bee, where more than 20 local high school students tested their neuroscience knowledge.



SfN advocacy and public outreach around the globe have become even more critical to ensuring greater awareness about neuroscience progress and potential.

Public Information and Outreach: *Building New Venues for Engagement*

SfN has continued to launch and sustain effective programming to engage the public and increase civic understanding and excitement about brain science. Building on the organization's historic public outreach strengths, SfN developed transformative resources for educators, policymakers, and the public in 2012, while continuing other major initiatives that have enduring value for the field.

In May 2012, with fellow founding partners The Kavli Foundation and the Gatsby Charitable Foundation, SfN launched *BrainFacts.org*, a website dedicated to communicating the progress and potential of brain research to a public audience. *BrainFacts.org* shares high-quality, scientifically vetted public information about the wonders of the brain and mind and will continue to grow by encouraging a public dialogue about brain research. The project's scientific leadership spans three continents and content partnerships with leading neuroscience organizations worldwide are underway. See page 30 for more about this initiative.

SfN continues to innovate by leveraging crowdsourcing, among other approaches, to develop novel and engaging educator resources. SfN received nearly 50 video submissions in the first annual Brain Awareness Video Contest, all of which were evaluated by scientists for creativity and accuracy. "The Treasure Hunt" took top honors and focused on aphasia, the loss of the ability to speak or understand language due to brain disease or injury.

Created by Shiree Heath, a graduate student at the University of Queensland in Australia, the animation tells of a child's quest to uncover his grandfather's "buried" words, much like a treasure hunt. Heath was honored at Neuroscience 2011 and by the Australian Embassy in Washington, DC, for her exceptional contribution to public outreach.

The Society also maintains a strong role in the Brain Bee program, cosponsoring and organizing the 2012 local Washington, DC, Bee. More than 20 students from 13 local high schools and one home-schooled group participated in this competitive test of neuroscience knowledge in February. Aidan Crank was the winner of the U.S. Brain Bee, held in Baltimore, while Teresa Tang was the winner of the International Brain Bee, which took place in Cape Town, South Africa.

Both the video contest and the Brain Bee are part of SfN's long-standing commitment to brain awareness, which culminated in the 17th Annual Brain Awareness Week Campaign, March 12–16. In collaboration with the Dana Foundation, the founder of Brain Awareness Week, SfN members took part in hundreds of events worldwide to foster greater interest in brain science and health.

SfN also maintains a strong commitment to serving science educators. For the ninth consecutive year, SfN delivered neuroscience resources to educators at the annual National Science Teachers Association conference attended by more than 8,000 science teachers. SfN managed a

high-traffic exhibit and two workshops where neuroscientists offered lessons in hands-on classroom activities.

Working With the Press

Recognizing the sustaining power of the media to communicate science news, SfN makes engaging reporters a priority. The Society forges important relationships with reporters year-round to accurately report scientific studies generated across the field, including *The Journal of Neuroscience*. In addition, media are encouraged to attend the annual meeting and report on emerging discoveries. At Neuroscience 2011, media registration and attendance reached near-record levels, reflecting an ever-growing interest in new findings about the brain and a highly lauded, comprehensive on-site media program. News coverage about the meeting sustained historic high interest, with more than 1,300 articles running in news outlets around the globe.



Shiree Heath (left), a graduate student at the University of Queensland in Australia, won the inaugural Brain Awareness Video Contest, which included a trip to Neuroscience 2011 to receive her award, presented by Public Education and Communication Committee member Patricia Trimmer (right).

Science Advocacy

With deep uncertainty surrounding science funding in many countries, SfN member advocacy has become even more critical to ensuring the voice of the biomedical research community is heard.

Expanding U.S. Efforts

In the United States, 52 SfN members participated in 2012 Capitol Hill Day, held in March in Washington, DC. SfN leaders, chapter representatives, institutional program members, and volunteers visited more than 70 congressional offices to make the case for strong NIH and NSF funding. More than 80 percent of participants in this year's Capitol Hill Day had never participated previously. Hill Day continues to be a key way to identify members interested in engaging in advocacy activities throughout the year.

Lab tours also continued this year, with six led by SfN members for their local members of Congress. SfN, along with the American Brain Coalition, remained an active sponsor of the new Congressional Neuroscience Caucus, which hosted several briefings on Capitol Hill showcasing the promise of research.

To deepen and expand advocacy year-round, the Society has begun a regular conference call series to share advocacy news and activities with members. Call participants get the latest legislative news, hear from Congressional staff, engage with colleagues in peer-to-peer learning about advocacy, and get action "assignments." Planning is also underway to engage more young scientists. This will involve traditional SfN communications channels, increased use of social media, engaging in coalition

activities focused on young researchers, and bringing new scientists to Washington, DC, for Capitol Hill Day in 2013.

SfN continues to work closely with coalition partners such as Research!America, the Ad Hoc Group for Medical Research, the Coalition for Life Sciences, and the Coalition for National Science Funding, making the case about the imperative of strong federal research investments.

Pursuing International Collaboration

This was the second year of the joint advocacy grant program between SfN and the Federation of European Neuroscience Societies (FENS). Following an advocacy planning session in June 2011 that convened dozens of leaders from across Europe, ten grants were awarded to FENS member societies to implement advocacy programs in their home

countries. Plans for a third year of grant funding in 2013 are underway. Other SfN-supported international advocacy activities include continued support for the Canadian Association for Neuroscience in its successful multi-organizational effort to establish a brain research fund in Canada and a newly launched advocacy effort underway in Mexico. SfN along with FENS played a catalytic role in supporting the formation of the International Brain Research Organization (IBRO) Global Advocacy Committee.

Supporting Responsible Animal Research

The Statement on the Use of Animals in Biomedical Research — originally developed in collaboration with FENS and the Japan Neuroscience Society — has expanded with the addition of the IBRO, which is now home to the statement and has added

28 signatories. A copy is available on SfN.org. IBRO maintains the list of organizations that have also endorsed the statement. The initiative has helped continue to spark interest in shared global advocacy on supporting animal research.

SfN has maintained active leadership in communicating about the importance of animals in research to the public. Through *BrainFacts.org* and the newly produced *Brain Facts* publication, the Society prominently highlights animal research success stories and the role of animals in the next century's medical advances. A generous grant from the Klingenstein Fund also funded enhanced visibility on *BrainFacts.org* for dedicated resources about this topic (see page 30).

 **LEARN MORE:**
SfN.org/baw
SfN.org/gpa
SfN.org/animals

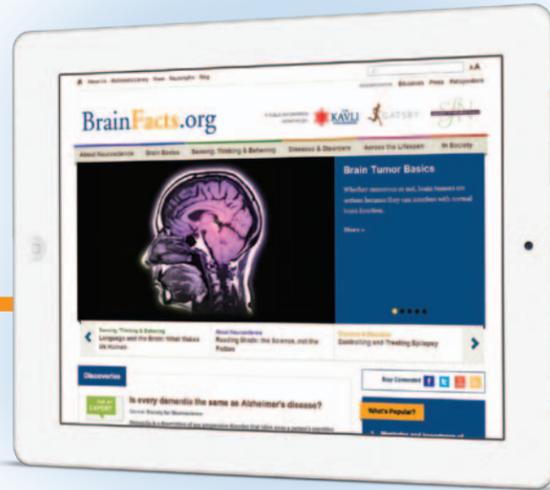
Strategic MILESTONES

- *BrainFacts.org*, a public information initiative of the Gatsby Charitable Foundation, The Kavli Foundation, and SfN, launched in tandem with the publication of the most recent edition of *Brain Facts* the book. Together these communication tools leverage the Web to reach the public in novel ways.
- 2012 Hill Day attendees visited more than 70 congressional offices to make the case for strong NIH and NSF funding levels.
- Ten European national societies launched public advocacy efforts funded by SfN and the Federation for European Neuroscience Societies (FENS).
- The International Brain Research Organization is now home to the Statement on the Use of Animals in Biomedical Research, an original collaboration between FENS, SfN, and the Japan Neuroscience Society. It has added 28 signatories.
- The public read more than 1,300 articles about Neuroscience 2011 that ran in print and online publications across the globe.

Ten European neuroscience societies received advocacy grants in 2012, funded by SfN and FENS

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

BrainFacts.org is a public information initiative of The Kavli Foundation, the Gatsby Charitable Foundation, and the Society for Neuroscience.



Welcome BrainFacts.org



Rep. Chaka Fattah (D-PA), a prominent supporter of neuroscience, and SfN President-Elect Larry Swanson at the BrainFacts.org launch event at SfN headquarters in Washington, DC.

A new website transforms the field's ability to share the wonders of the brain and mind.

What goes on in the brain during sleep? How do brain cells communicate? Why do children learn faster than adults? Answers to these and thousands of other questions about the brain and mind are available at *BrainFacts.org*, a public information initiative of The Kavli Foundation, the Gatsby Charitable Foundation, and SfN.

BrainFacts.org provides a new way for people of all ages to learn more about how the brain functions, how it drives thought and behavior, and how it is affected by diseases and disorders. Parents and teens can explore the maturing brain and what factors influence its development. Family members can understand the underlying causes of diseases and disorders affecting loved ones. Educators can access teaching tools and information on relevant issues like autism, ADHD, and sleep loss, which may affect student achievement. Policymakers and concerned citizens can learn more about the scope of neuroscience research

worldwide. The site also highlights emerging tools and technologies in neuroscience, the responsible use of animals in research, and groundbreaking research discoveries.

In the first month following site launch, nearly 40,000 visitors came to *BrainFacts.org* — a high level of activity for a new site of its kind. In its first four months, the site has tallied more than 285,000 page views. Approximately half of all visitors are from the United States. Many users come to *BrainFacts.org* from the United Kingdom, Canada, Australia, the Philippines, India, Germany, and Norway, among other nations.

Under the guidance of Editor-in-Chief Nick Spitzer, *BrainFacts.org* invites the public to engage in the excitement of scientific discovery at a time of growing fascination with the brain and mind, and critical need for continuing science education. As part of SfN's enduring public outreach mission, *BrainFacts.org* helps bridge the gap between brain scientists and the general public through a dynamic

and accessible online platform. The site is filled with authoritative, accessible content, and plans are in place to add additional content and features such as blogging, as well as other tools that meet audience needs and leverage emerging technologies. It is also a great resource for SfN members, science educators, and others who interact with the public and need a place to send people for authoritative information. Notably, *BrainFacts.org* features the newly updated, seventh edition of its companion book, *Brain Facts*, which can be downloaded in full from the website.

With *BrainFacts.org*, SfN partners with two organizations devoted to basic science and its communication. The Kavli Foundation, established by Fred Kavli, is dedicated to advancing science for the benefit of humanity, promoting public understanding of scientific research, and supporting scientists and their work. The Gatsby Charitable Foundation is a trust set up by Lord David Sainsbury to realize his

charitable objectives. The Gatsby and Kavli Foundations generously donated a total of \$1.53 million over six years to build and sustain *BrainFacts.org*.

Recognizing that exceptional public information material is created in research organizations around the globe, *BrainFacts.org* features content both from its founding partners and six initial content partners on launch: the Dana Foundation; the Canadian Institutes of Health Research—Institute of Neurosciences, Mental Health and Addiction; the International Brain Research Organization; the National Institute of Mental Health; the National Institute of Neurological Disorders and Stroke; and the Wellcome Trust.

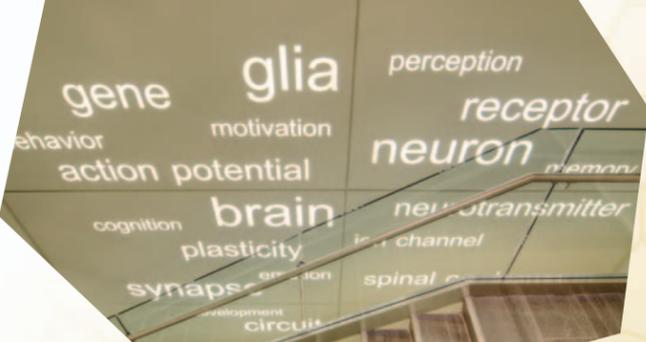
The site is guided by an international editorial board of leading neuroscientists from four countries. Over time, *BrainFacts.org* expects to forge new content partnerships with organizations worldwide, and the editorial board continues to

make expanding interactivity a prominent goal.

SfN and current international content partners on both sides of the Atlantic Ocean celebrated the launch of *BrainFacts.org* with scientific events in Washington, DC, and London. The Washington, DC, event featured a talk by editorial board member Terrence Sejnowski on learning and memory. At the London launch event, Russell Foster spoke about visual systems involved in circadian rhythms.

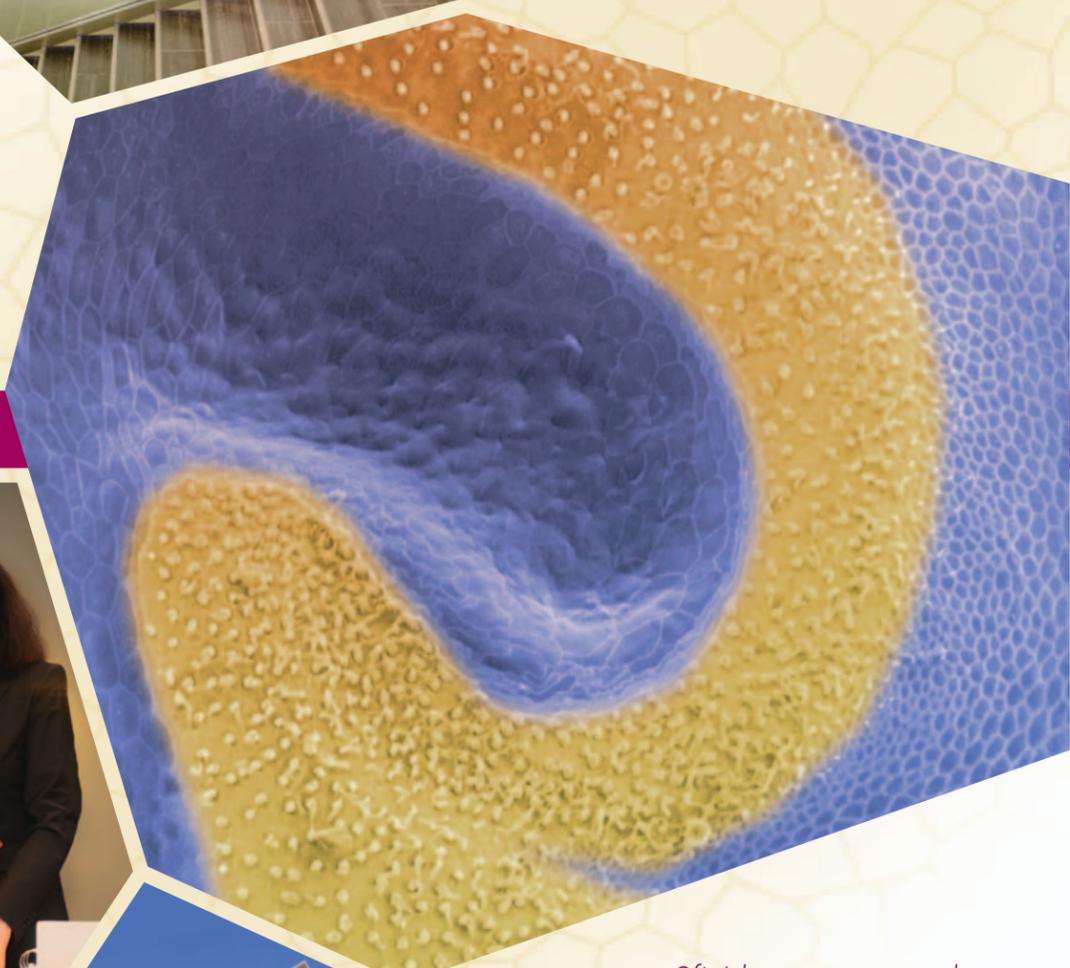
Stay updated on the latest brain discoveries

-  @Brain_Facts_org on Twitter
-  facebook.com/BrainFactsOrg
-  SfN YouTube channel, youtube.com/sfnvideo



Top: SfN recently expanded office space in its headquarters building located in downtown Washington, DC. As part of this expansion, the backlit "word cloud" display highlights key terminology and concepts in the dynamic and growing neuroscience discipline.

Financial and Organizational HIGHLIGHTS



SfN has maintained its posture of modest but strategic expansion to serve its growing membership, and continues to leverage external funding to build member value.



Above: The SfN president role transitioned at Neuroscience 2011 from Susan Amara of the University of Pittsburgh to Moses Chao of New York University.

Right: The Society's headquarters building had full occupancy in FY2012, helping to drive an increase in revenue.



Investing in the Mission

Careful planning and management by SfN Council and staff resulted in a strong SfN financial and organizational performance in FY2012. In a volatile global economic environment, SfN has maintained its posture of modest but strategic expansion to serve its growing membership and continues to leverage external funding to build member value.

In FY2012, operating net revenue totaled \$1.9 million on total revenue of \$29.2 million. The revenue was driven by:

- Record membership of 42,576
- Stable library subscriptions to *The Journal of Neuroscience*
- The second-largest annual meeting ever, with more than 32,000 attendees, 16,000 abstract submissions, and 1,000 exhibitor booths
- Full occupancy for 1121 Properties LLC, SfN's office building and headquarters
- Continued grant support from NIH and NSF
- Private grants, corporate support, and individual donations

Reflecting prudent financial stewardship principles developed by Council, SfN increased investments, totaling \$1.75 million, in its long-term reserves in FY2012, consistent with the Society's Financial Reserve Strategy, which takes into account the volatility and uncertainty of today's markets. Long-term investments totaled \$38.1

million as of June 30. The Society's investment strategy continues to be overseen by the Investment Committee, which includes three *pro bono* investment professionals to ensure appropriate diversification and discipline and help achieve goals established by Society leadership.

External Partnerships Strengthen Mission

SfN continues to build on a growing stream of external funding to advance activities and initiatives beyond SfN's operating budget revenue. In FY2012, external funding revenue grew by 17 percent to a total of more than \$1.6 million. This growth resulted from a combination of positive factors including new and increased levels of support for the annual meeting and its events, corporate funding, and new program funding sources. This revenue was applied to key functional areas such as annual meeting events, awards and prizes, and program support for new initiatives such as *BrainFacts.org*, Engaging the Public about Animals in Research, and the Neuroscience Scholars Program 30th anniversary video.

Expanding Programs, Leveraging Technology

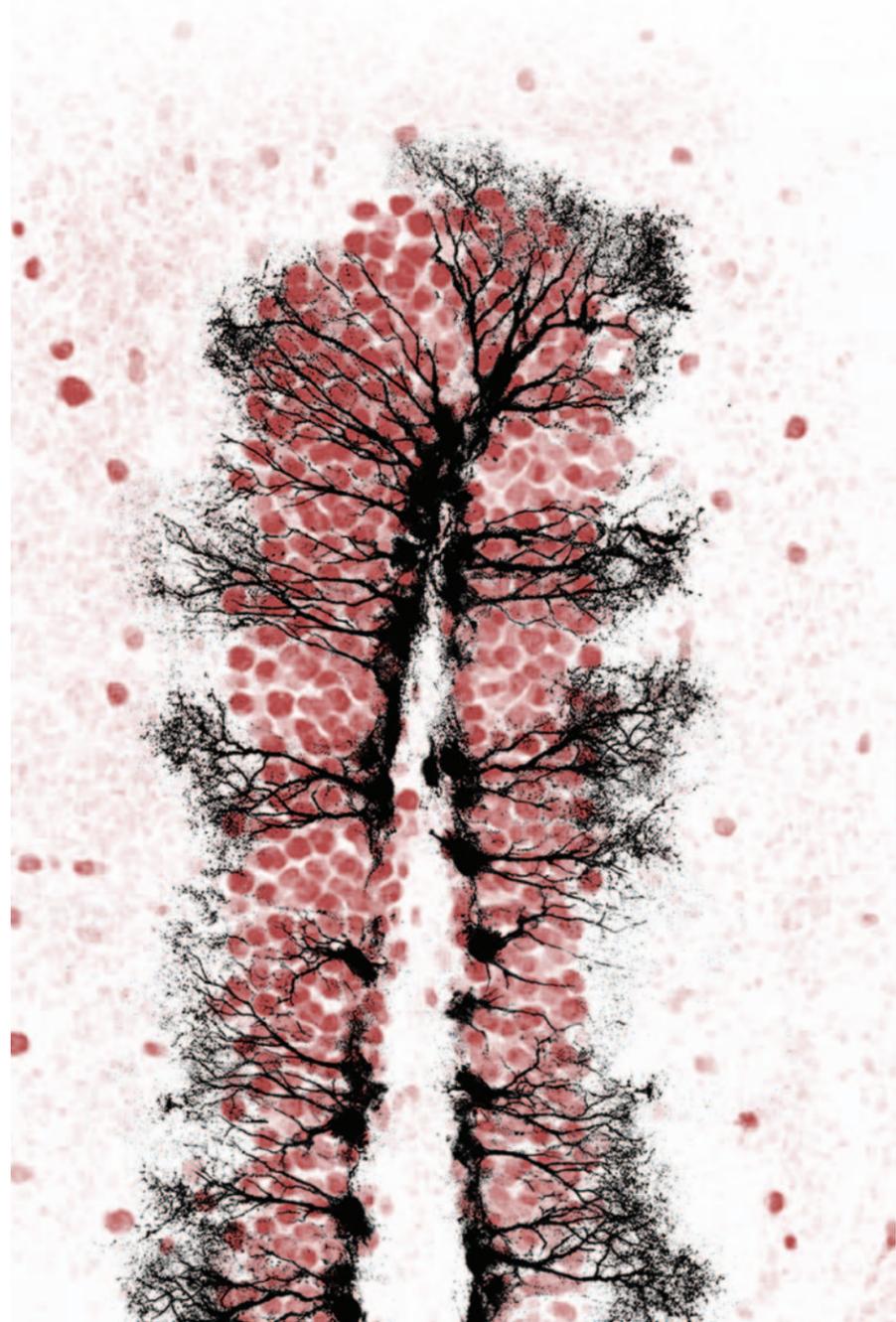
SfN made significant long-term investments in professional development, global programs, and public education in FY2012, enhancing and expanding member experiences, and engaging the public. SfN also continued to invest in capital projects for facilities,

systems, and information technology infrastructure to ensure efficient operations.

Technology is also a key part of SfN's strategy to enhance the member experience. As part of a comprehensive mobile strategy, SfN launched two mobile offerings for browsing *The Journal of Neuroscience*: an iOS app available in the Apple Store and a mobile website for all mobile devices. In addition, a new mobile app for Neuroscience 2012 links to the Neuroscience Meeting Planner and provides navigation tools. An app is also being developed for social media engagement on *NeurOnLine*.

A new SfN.org website is also in development for launch in 2013. Following the successful launch of *BrainFacts.org* — SfN's new public website about the brain and nervous system funded by The Kavli Foundation, the Gatsby Charitable Foundation, and SfN — the new SfN.org site will focus on communicating with the neuroscience community and its key constituencies and audiences. The site's content will be organized for easy searching and browsing, and feature embedded social networking capabilities from *NeurOnLine* and connectivity with *BrainFacts.org*. By leveraging investments made in SfN's association management system over the past several years, the site also will offer a more personalized member experience; over time, this strategy will enable site users to identify what information they want and when they want it, maximizing member time and ensuring effective communications in an ever more competitive information landscape.

“SfN made significant long-term investments in professional development, global programs, and public education in FY2012, enhancing and expanding member experiences, and engaging the public.”



Photography CREDITS

Front Cover, Inside Front Cover, Back Cover: Confocal reconstruction of the cone photoreceptor mosaic of a 5 day old zebrafish. UV (purple), S (cyan) and L (red) cones are labeled by expression of distinct color fluorescent proteins in a triple transgenic line. M (green) cones are distinguished by digitally subtracting the L cone signal after labeling of both L and M cones by the antibody, zpr1. Image by Sachihiko C. Suzuki. Courtesy, with permission: Rachel Wong.

Page 2: Artistic interpretation of a retinal section from an embryonic mouse that expresses the transcription factor *Foxd1* (blue) in the temporal area. Axons arising in the temporal retina (red) will exit the retina, traverse the developing brain, and finally innervate the anterior part of the superior colliculus, which is represented as a yellow-blue semi-ellipse in the bottom of the image.

Courtesy, with permission: Maria I. Carreres, Augusto Escalante, Blanca Murillo, Geraud Chauvin, Patricia Gaspar, Celia Vegar, and Eloisa Herrera, 2011, *The Journal of Neuroscience*, 31: 13906-13915

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Page 3, 25: A neuronal glutamate transporter clusters at post-synaptic sites. Confocal image of 11 day old cultured hippocampal neurons co-transfected with constructs expressing soluble cyan fluorescent protein (blue) and full-length glutamate transporter, EAAT3, fused to a yellow fluorescent protein (yellow). EAAT3 is seen in clusters on the dendritic surface and on spines and filopodia, whereas the soluble cyan fluorescent protein fills the entire cell.

Courtesy, with permission: C. Cheng, G. Glover, G. Banker, and S.G. Amara, 2002, *The Journal of Neuroscience*, 22: 10643-52

Page 5: Pseudocolor image of an organotypic hippocampal slice showing glial cells loaded with the calcium-sensitive dye Calcium Orange (dentate gyrus at top right, CA3 at bottom, and CA1 at left). Calcium Orange was used to monitor astrocyte calcium responses to single-neuron stimulation.

Courtesy, with permission: Chris Salmon, Emma V. Jones, W. Todd Farmer, David Stellwagen, and Keith K. Murai, 2011, *The Journal of Neuroscience*, 31: 8905-8919

Page 8: Cortical maturation in a 14-week-old infant as revealed by a maturation index computed from a normalized T2-weighted magnetic resonance image and projected onto a three-dimensional mesh of the gray-white matter cortical interface. The scale goes from dark blue to yellow-red as maturation increases. On this image, which is centered on the posterior sylvian scissure, the early maturation of primary cortices in the central region and Heschl's gyrus stands in contrast to the immature middle temporal gyrus.

Courtesy, with permission: François Leroy, Hervé Glasel, Jessica Dubois, Lucie Hertz-Pannier, Bertrand Thirion, Jean-François Mangin, and Ghislaine Dehaene-Lambertz, 2011, *The Journal of Neuroscience*, 31: 1500-1506

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Page 11: Pseudocolored image of immunofluorescent labeling of neurons (NeuN, red) and astrocytes (GFAP, blue) in the hippocampal CA1 pyramidal cell layer of transgenic

mice overexpressing truncated amyloid- β . In these animals, formation of a highly neurotoxic amyloid- β species, pyro-Glu-A β , induces progressing astrogliosis and neuronal loss.

Courtesy, with permission: Anca Alexandru, Wolfgang Jagla, Sigrid Graubner, Andreas Becker, Christoph Bäscher, Stephanie Kohlmann, Reinhard Sedlmeier, Kerstin A. Raber, Holger Cynis, Raik Rönicke, Klaus G. Reymann, Elisabeth Petrasch-Parwez, Maike Hartlage-Rübsamen, Steffen Rossner, Stephan Schilling, Alexander P. Osmann, Hans-Ulrich Demuth, and Stephan von Hörsten, 2011, *The Journal of Neuroscience*, 31: 12790-12801

Ultrastructural transmission electron microscope image of *Xenopus laevis* retina, with colors overlain to reveal GABAergic (red) and glycinergic (green) amacrine cells with their processes in the inner plexiform layer, as well as glutamatergic (blue) excitatory cell classes, including bipolar cells and ganglion cells.

Courtesy, with permission: Damian C. Lee, W. Drew Ferrell, Beatrice M. Tam, Bryan W. Jones, Robert E. Marc, and Orson L. Moritz, 2012, *The Journal of Neuroscience*, 32: 2121-2128

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Page 14: The social recognition deficit and its rescue by intracerebroventricular injections of OT. a, Different female trials: male mice were exposed to two novel ovariectomized stimulus females for 5 min each. After an interexposure interval of 30 min, a novel female was paired with each male. The data are presented as the RDI \pm SEM. Neither OTKO nor WT males showed a significant decline in the amount of time spent investigating the females presented during the second trial. b, Same female trials: after the initial 5 min social encounter and a 30 min interexposure interval, each male was paired with the same female to whom he had been previously exposed. Asterisks denote social recognition, measured as a decline in the duration of investigation during the second trial ($p < 0.05$).

Modified from: J. N. Ferguson, J. M. Aldag, T. R. Insel, and L. J. Young, 2001, *The Journal of Neuroscience*, 21(20):8278-8285.

Page 15: Tom Adams, Photographer, used under Creative Commons license.

Page 16: Dentate granule cells generated in the adult mouse hippocampus labeled by retroviral expression of green fluorescent protein. This pseudocolored image was obtained by two-photon microscopy in 400- μ m-thick sections. Artwork by M. Georgina Davies and Nicolás A. Morgenstern.

Courtesy, with permission: Verónica C. Piatti, M. Georgina Davies-Sala, M. Soledad Espósito, Lucas A. Mongiat, Mariela F. Trincherro, and Alejandro F. Schinder, 2011, *The Journal of Neuroscience*, 31: 7715-7728

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Page 23: Percent of Youth 4-17 ever Diagnosed with Attention-Deficit/Hyperactivity Disorder: National Survey of Children's Health, 2007. Courtesy of Centers for Disease Control.

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Page 26: Sequential *in utero* labeling of earlier-born projection neurons electroporated at embryonic day 14.5 (E14.5) (green) and later-born neurons electroporated at E15.5 (red) in developing mouse neocortex. Dab1, a downstream effector of Reelin, was knocked down in the later-born neurons, and the image was obtained at postnatal day 7. Reelin (cyan) is an essential regulator of the "inside-out" development of the neocortex. Knockdown of Dab1 caused terminal translocation failure of later-born neurons, thus disrupting the inside-out pattern. Magenta is nuclear staining.

Courtesy, with permission: Katsutoshi Sekine, Takao Honda, Takeshi Kawauchi, Ken-ichiro Kubo, and Kazunori Nakajima, 2011, *The Journal of Neuroscience*, 31: 9426-9439

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Page 32: A scanning electron micrograph of the surface of the amphibian papilla showing hair cells (yellow) in the sensory epithelium. The diffusion barriers created by the synaptic ribbon and its vesicles may play a key role in synchronizing vesicle release.

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Page 34: Mouse dentate gyrus immunolabeled for the transcriptional repressor REST (red), which is required for neural stem cell quiescence and controls the initiation and progression of neurogenesis in adult hippocampus. Yellow fluorescent protein (black) is expressed in quiescent and activated type 1 neural stem cells.

Courtesy, with permission: Zhengliao Gao, Kerstin Ure, Peiguo Ding, Mostafa Nashaat, Laura Yuan, Jing Ma, Robert E. Hammer, and Jenny Hsieh, 2011, *The Journal of Neuroscience*, 31: 9772-9786

Inside Back Cover: Artistic rendering of time-frequency plots of electrocorticographic signals recorded subdurally while human subjects said monosyllabic words. These signals revealed unique spectral patterns associated with different speech activities.

Courtesy, with permission: Charles M. Gaona, Mohit Sharma, Zachary V. Freudenburg, Jonathan D. Breshears, David T. Bundy, Jarod Roland, Dennis L. Barbour, Gerwin Schalk, and Eric C. Leuthardt, 2011, *The Journal of Neuroscience*, 31: 2091-2100

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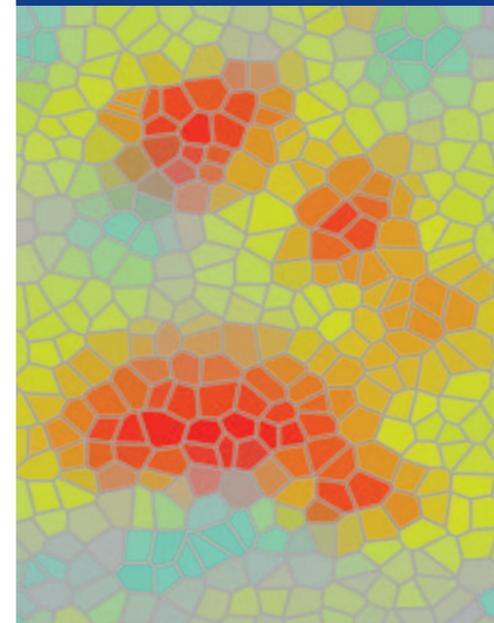
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