

NEUROSCIENCE

SUMMER 2014

Q U A R T E R L Y

“Let your love of science be your guide as you navigate a career path. Pursue your goals, show passion for them, and do everything in your power to attain your dreams.”

– Carol Mason,
SfN President

Message from the President

What’s Ahead in Careers in Neuroscience



Carol Mason,
SfN President

It is truly the golden age of neuroscience. Advances in technology are ushering in opportunities beyond our wildest dreams, enabling us to trace the connections between brain regions, probe brain function with light, and connect genes with cell- and systems-wide neural processes. Progress is being made at a dazzling speed, and neuroscience is in the limelight thanks to the BRAIN Initiative, the Human Brain Project, and other research ventures around the world.

As a co-director of Columbia University’s neurobiology graduate program, I and my colleagues at other institutions have witnessed a sea change in the career paths of trainees in recent years. For graduate students and postdocs now — those who haven’t started to think about careers and those who have done all that’s recommended but are frustrated by their efforts — the thrill of continuing in neuroscience is offset by worry about the future. Can I succeed in a ramped-up competition for funding and publishing that shows little sign of abating? Will I find a position in the same city as my mate? Is it possible to be a scientist in such a harsh environment and still have a life? Will I be able to land an academic position or NIH grant? And if I choose to go off the academic track, intentionally or reluctantly, what career choices are out there?

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Results of the 2014 SfN Election

The Society for Neuroscience congratulates its newly elected officers and councilors. Chosen by members using an independent online monitoring company, the incoming council members begin their terms at Neuroscience 2014 in Washington, DC.

The membership elected Hollis Cline as the incoming president-elect, Michael Stryker as the incoming treasurer-elect, and Gina Turrigiano as the incoming secretary-elect. The elected incoming councilors are Barry Everitt and Catherine Woolley.

OFFICERS

PRESIDENT-ELECT

Hollis Cline is the Hahn Professor of Neuroscience in the departments of Molecular and Cellular Neuroscience, and Chemical Physiology at the Scripps Research Institute in La Jolla, Calif. Her participation at SfN has included serving on Council as a councilor and secretary and chairing the Committee on Committees. She was also a member of the recent Editor-in-Chief Search Committee, the Program Committee, and the NGA/SEA and Young Investigator Award selection committees. Cline’s research focuses on the role of experience-dependent mechanisms in controlling the development, function, and plasticity of the brain circuits.

TREASURER-ELECT

Michael Stryker is the William Francis Ganong Professor of Physiology and professor of biomedical engineering and therapeutic sciences at University of California,

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Pierre Magistretti: IBRO Works to Train Young Neuroscientists Around the World



Pierre Magistretti,
IBRO President

Pierre Magistretti began his three-year term as president of the International Brain Research Organization (IBRO) in January and formerly served as the secretary-general of IBRO from 2010-2012. He is the dean of the Division of Biological and Environmental Sciences and Engineering at the King Abdullah University of Science and Technology in Saudi Arabia. He is on leave from his posts as professor at the University of Lausanne Medical School and Hospitals

Center for Psychiatric Neuroscience and professor at the Brain Mind Institute of the Federal Institute of Technology in Lausanne, Switzerland.

NQ: What have you defined as IBRO's goals during your three-year term as president? Will you be focusing on programs or projects currently underway that can help reach those objectives?

I intend to further strengthen the activities that are central to IBRO and in particular promoting training of young neuroscientists from all over the world. The IBRO training programs span from the early to the more advanced stages. Thus, the Visiting Lecture Training Program is aimed at sensitizing students to neuroscience, sometimes in remote areas of the world. At the other end of the spectrum, there is the IBRO College model, where very talented and well-trained neuroscientists from less favored countries can interact with young faculty from countries where neuroscience is well-established to form collaborative relationships among the future leaders in neuroscience.

IBRO is organized in regions, a feature that ensures a local presence and an in-depth understanding of the specific needs of a region. IBRO has already been quite successful in Africa and South America, and its activities are very well-established in these two regions. As IBRO's secretary-general from 2010 to 2012, I promoted the development of the Middle East and North Africa region; this effort should continue, but I intend to also further develop IBRO's activities in high-potential countries such as China and India. I plan to visit these two countries and possibly others in the region in the coming months in order to become more familiar with their needs and expectations and to see how the mission of IBRO can be expanded there.

Supporting education and training are at the core of IBRO's efforts. Another dimension that IBRO will continue to support is a Return Home Program for well-trained scientists to support local capacity-building in ways that are meaningful for the local needs in less favored regions. Such programs can enhance the privileged connections between countries with established neuroscience programs and those with fewer resources.

Finally, I would like to continue to expand the impact of IBRO's journal, *Neuroscience*, with its international editorial board and commitment to publishing high-quality work from all world regions.

NQ: This is an exciting time for the field of neuroscience, with the Human Brain Project (HBP) in Europe, the BRAIN Initiative in the U.S., and several additional projects underway in China, Japan, and elsewhere. What short-term and long-term effects do you think these efforts will have on the field?

Overall, I think that these projects will bring a fantastic boost to the knowledge of brain function. I have had the privilege to attend all but one SfN annual meeting since 1980. The expansion, or better, the explosion, of the amount of data that has been gathered over the past 35 years is simply mind-boggling. Yet, we are still a long way from understanding brain function, in particular higher brain functions. There is an urgent need to integrate these data into meaningful models that can be tested against the existing experimental data as well as inspire new, well-targeted experiments. These projects will also stimulate international collaborations. It would be highly desirable that, in particular, the HBP and BRAIN initiatives pave the way to such collaborations as these two projects are highly complementary. We will look with great interest at the new initiatives that China is planning to promote in brain research.

NQ: What do you see as the primary challenges facing the field of neuroscience? How can organizations such as IBRO and SfN address those challenges, and how can individual neuroscientists get involved?

From a scientific point of view, I think bridging the various levels of resolution, from molecules to networks, to understand brain function still represents a major challenge.

I intend to further strengthen the activities that are central to IBRO and in particular promoting training of young neuroscientists from all over the world. The IBRO training programs span from the early to the more advanced stages.

This integration across scales should be addressed in some of the schools organized by IBRO in order to sensitize students to this challenge. Ethical issues also need to be addressed — notably issues such as the development of deep brain stimulation for neuropsychiatric disorders and the encouraging progress in neuroprosthetics and brain computer interfaces. In general, the debate about realistic ethical frameworks for experimentation in humans should be entertained. Another issue is the alarming withdrawal of the major pharma from neuroscience research. This implies that progress in the development of therapeutic strategies will essentially rely on academic research and the spinoffs thereof. It is therefore of the utmost importance that organizations such as IBRO and SfN engage in advocacy initiatives to sensitize decision-makers to maintain strong financial support for neuroscience research.

NQ: IBRO is active around the world through its regional committees in Africa, Asia, the Middle East, North America, Europe, and Latin America. How can the neuroscience community effectively combine efforts around the globe to advocate for science?

Global advocacy is a recent and very significant activity for IBRO. In view of its international reach and regional organization, IBRO has been chosen as the coordinator of the Global Advocacy Initiative under the leadership of Sten Grillner, the secretary-general of IBRO. This initiative brings together SfN, the Federation of European Neuroscience Societies, the Japanese Neuroscience Society, the Australian Neuroscience Society, the Dana Foundation, and the International Society for Neurochemistry to organize and support global advocacy activities worldwide. It is very important that political leaders and decision-makers

are sensitized to the importance of brain research, not only for the sake of scientific research but also for the well-being of humankind. Indeed, science provides a universal language that cuts across cultures; the study of the brain and its functions is at the core of human nature and may therefore be even more impactful in this regard.

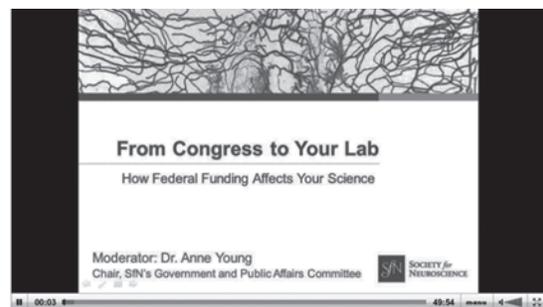
I would like to invite neuroscientists from all over the world to the IBRO Congress, which will take place in Rio de Janeiro in July 2015. This meeting is different from those taking place in the U.S., Europe and national societies in that it is truly international, with scientists from all over the world, and we should support it as much as we can. The Congress' excellent International Program Committee has ensured an outstanding scientific program. Learn more at ibro2015.org. ■

INTERESTED IN ONLINE LEARNING?

Enhance your neuroscience knowledge.

SfN Webinars Cover:

- Careers and Training Advice
- Advocacy Information
- Scientific Lectures
- Professional Development Workshops



Available now on SfN.org/webinars

These daunting, middle-of-the-night anxious questions crop up even in scientists who already hold positions in academia! So, my advice to students and postdocs is this: If you find science rewarding, or if you enjoy simply thinking about science apart from lab work, there is a place for you. And SfN can help.

PREPARING FOR A CAREER IN NEUROSCIENCE

The breadth of current activities in neuroscience provides avenues for scientists to carve out their own success stories. Doing so takes time, effort, and personal reflection. The following guidelines may help in developing your own path.

Look to yourself: Determine what you like doing. What are your passions? Do you prefer writing over bench work? Are you more comfortable within a research group or do you want to run the show? Once you figure out what you want, articulate your vision to potential employers, mentors, and friends.

Learn to love your PhD: The skills you've learned in your PhD program or during your postdoc — how to think critically, take ownership of projects, collaborate with others, write and speak in scientific and lay terms, and solve ethical issues — are extremely valuable in a variety of jobs. Reflect on those skills and experiences to help identify a career path.

Seek mentoring and find advice: Mentors play a key role in helping plan and advise your career. A mentor should be someone you trust and with whom you can share confidences and get candid feedback. Work with your mentor on an individual development plan (IDP) to identify your strengths and weaknesses, and to guide you in leveraging your talents into a satisfying career. It is wise to initiate this process a year or more before the end of your graduate or postdoc training.

Present yourself in writing: Publishing a paper on your work demonstrates your ability to complete a project and present it well, irrespective of your next career step. Learn to write about science in lay language by working with a writing group or center at your university.

Speak for yourself: Like those in the business world, these days scientists should learn to network and advocate for themselves. Attend career events and engage in conversation with others in the field. Practice an “elevator speech” — a one-minute description of who you are, what you have done, and what you would like to do. Potential employers look at your ability to communicate and how collegial you might be. And, as you interview, consider whether you would mesh with the group and its environment.

RESOURCES TO HELP NAVIGATE A CAREER PATH

Recognizing that funding and employment challenges have changed the outlook for careers in neuroscience, SfN has developed support and training resources for scientists at every career stage. The SfN.org “Careers & Training” section features not only job notifications, but testimonials and advice on career options beyond the bench and professional development opportunities.

I urge you to view the new SfN “Joys of Science” video series in the NeuroJobs Career Center. Established neuroscientists speak to the value of being engaged in their field, the failures they have faced, and the unmitigated joy they meet in discovery. “Meet the Experts” podcasts showcase scientists talking about how they pursue their specific research areas and career paths. Tips and advice for postdocs are also available online, including information on publishing, networking, and training programs.

The best opportunities to learn about career options come from attending the annual meeting and through SfN's members-only online community, *NeurOnLine*. The career advice forum on *NeurOnLine* features more than 600 members sharing professional development experiences, hurdles, and advice.

WHAT JOBS ARE AVAILABLE?

An independent academic position certainly has great benefits: You can establish your own scientific vision, recruit a talented team, and produce a stream of papers on new findings. And despite its demands, the academic arena can bring more flexibility in the workplace than corporate, nonacademic positions.

Many view tenure-track faculty positions at a research university or medical school as the ultimate prize, but the PhD you have earned need not be deployed only in such settings. Students, postdocs, and trainees should be prepared to explore alternative career paths that draw on scientific training and can be just as rewarding. I encourage you to explore teaching at a small college or a high school, both still “academic.” Your PhD training and participation in outreach activities provide you with experiences and tools for teaching beyond conventional teacher training.

As a neuroscientist, you can find career opportunities in government, publishing, private corporations, consulting groups, and advocacy and nonprofit organizations. Disease foundations, where you can lead outreach and fundraising activities, are expanding venues dependent on broad training in neuroscience. We need trained scientists to become

science journalists, to interpret the latest results for the public. You might even contemplate becoming an entrepreneur by starting a business based on what you researched.

It is a myth that nonacademic jobs are less prestigious than academic ones. Graduate programs and postdoc offices are increasingly mounting programs in professional skills training and offering career advice. If your institution does not offer such programs, you should ask for them.

YOUR LOVE OF SCIENCE

Many challenges indeed face young scientists after their training. Ambitious, qualified trainees may have already soul-searched

and know the reasons why they love science, but they face real difficulties in securing that career through no fault of their own. Remember that you are not alone. We realize we can no longer simply train students in our own image. We are striving to enable you to use your talents to good ends, and SfN is assisting in guiding your professional development and career pursuits so that the field can continue to flourish.

Most of all, I encourage you to remember your initial attraction to science. Try not to let failed experiments or mentor troubles sway you from staying in it; let your love of science be your guide as you navigate a career path. Pursue your goals, show passion for them, and do everything in your power to attain your dreams. ■

Learning About the Brain at the USA Science and Engineering Festival

At the third USA Science and Engineering Festival in April in Washington, DC, the Society for Neuroscience hosted a booth that presented hands-on science activities to hundreds of children and adults. SfN's booth, *The Universe Between Your Ears: Explore Your Brain*, educated festival participants about neuroscience with games that challenged the brain while neuroscientists discussed memory, neurological disorders, and other neuroscience topics. ■



Festival attendees learn about how smell influences taste using a jelly bean taste test at the SfN booth.



Scott Thompson, PhD, answers questions about the brain and discusses BrainFacts.org.



Volunteer Rachel Kay, a postdoctoral fellow at Children's National Medical Center, engages participants with a mirror drawing activity to show attendees how quickly the brain can learn new tasks.

Exploring Addiction, From Origins to Treatments

Despite the increased risk of health problems, lost relationships, financial ruin, and even death, millions of people worldwide who suffer from drug and behavioral addictions cannot stop.

Researchers gathered at a press conference at Neuroscience 2013 to discuss recent studies of drug addiction, its neurobiological basis, and novel approaches to treatment. Barry Everitt of the University of Cambridge moderated the event.

CHRONIC PAIN MAY TRIGGER ESCALATING DRUG USE

Many factors contribute to drug abuse, and clinical studies suggest chronic pain is one of them.

Press conference presenter Lucia Hipolito of Columbia University wanted to know how pain affects drug intake in animals previously exposed to heroin. She and her colleagues trained rats to self-administer heroin before giving them a hind paw injection that caused chronic inflammatory pain. Two days later, the animals were given access to varying doses of heroin.

Compared with animals that were not in pain, the animals in pain self-administered less and worked less for the lowest heroin dose. In contrast, when exposed to the highest dose, animals in pain took more heroin than the other animals. Hipolito also found that the animals in pain required more heroin to release the same level of dopamine in the nucleus accumbens as the pain-free animals release at the lowest heroin dose.

“Our research shows that, in patients, chronic pain could trigger an escalating use of drugs, which may lead to the abuse and increased risk of drug overdose,” Hipolito said.

LESION STUDIES OFFER CLUES ABOUT GAMBLING ADDICTION

Press conference presenters also discussed findings about behavioral addiction.

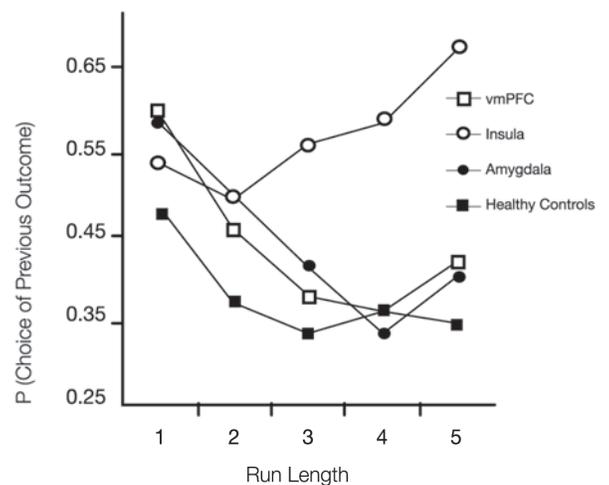
In an effort to understand whether certain brain regions are involved in gambling decisions, presenter Luke Clark and his colleagues at the University of Cambridge compared gambling behaviors of healthy people with those of people with brain injuries in the ventromedial prefrontal cortex, the insula, or the amygdala.

In one test, the researchers explored the participants’ tendency to adopt the “gambler’s fallacy” — the delusion that one spin of the roulette wheel affects the outcome of the next spin. After several spins in which the roulette wheel landed on red, healthy participants as well as those with damage to the amygdala or the ventromedial prefrontal cortex were more likely to predict the next spin would land on blue. However, this effect was abolished in people with damage to the insula, who were more likely to choose red after a longer run of red.

Another test evaluated how the participants react to “near-miss outcomes” — the fallacy that often leads people to believe a near-miss on a slot machine is a sign they are closer to hitting the jackpot. People who were healthy as well as those with amygdala damage reported increased motivation to keep playing a slot machine after matching icons almost lined up — a near-miss. People with insula damage, however, failed to show this same motivation when presented with a near-miss.

Clark suggests that these findings indicate that “in problem gamblers, who we know are susceptible to these styles of thinking, the insula region may be overactive.”

“Gambler’s Fallacy” Is Abolished in People with Insula Damage



After several spins in which a roulette wheel landed on red, healthy participants and those with damage to the amygdala or the ventromedial prefrontal cortex were more likely to predict the next spin would land on blue (as reflected in the decrease in P over time in the graph above). This effect was abolished in people with damage to the insula, who were more likely to choose red after a longer run of red. Courtesy: Luke Clark, University of Cambridge

GAMBLERS ARE SLOWER TO REACT TO NONMONETARY CUES

Another region of interest in the study of pathological gambling is the ventral striatum, an area activated in the presence of money, food, alcohol, and sex.

Presenter Guillaume Sescousse of Radboud University in Nijmegen, Netherlands, studied whether the ventral striatum of pathological gamblers responds differently when presented with monetary vs. nonmonetary cues. He and his colleagues designed a game in which participants could either win money or see pleasant erotic pictures if they responded rapidly to a prompt while in an fMRI scanner.

Unlike healthy participants, who displayed similar reaction times to monetary and erotic cues, pathological gamblers reacted more slowly to erotic cues than to monetary cues. Imaging revealed that, during this game, the ventral striatum was similarly activated in healthy subjects regardless of whether the cue was monetary or erotic. In contrast, gamblers showed reduced activity in the ventral striatum in response to erotic cues compared with monetary cues. The more severe the participant's gambling problem, the more pronounced the difference in the ventral striatum reactivity to monetary vs. erotic cues.

"Our study shows that pathological gambling is characterized by an imbalance in reward sensitivity," Sescousse said. "We think this could represent a neurophysiological mechanism by which monetary cues override the incentive of nonmonetary cues and promote compulsive gambling at the expense of other rewarding activities."

BRAIN STIMULATION THERAPIES MAY HELP ADDICTS KICK THE HABIT

Scientists hope that advances in understanding how addiction changes the brain will lead to better treatments that can help reverse those changes.

Previous studies in animals have shown that high-frequency stimulation to the subthalamic nucleus (STN) decreases animals' motivation for cocaine. Presenter Carrie Wade of the Scripps Research Institute wanted to know whether the same was true for animals addicted to heroin. Animals that received high-frequency deep stimulation to the STN took less heroin, failed to escalate their heroin intake over time, and did not work as hard as control animals to obtain the next infusion of heroin.

"We think deep-brain stimulation has the potential to treat heroin addiction in medication-resistant patients," Wade said.

Another stimulation therapy of interest in the treatment of addiction is deep transcranial magnetic stimulation (dTMS) — a noninvasive technique that sends electrical impulses deep into the brain to stimulate or dampen activity in large networks of neurons.

To determine how this technique might be applied to people trying to quit smoking cigarettes, presenter Abraham Zangen and his colleagues at Ben-Gurion University in Israel recruited heavy smokers who had failed at previous attempts to quit smoking. Study participants received high-frequency dTMS, low-frequency dTMS, or a sham stimulation to the lateral prefrontal cortex and insula for 13 sessions (20 minutes each) over a three-week period. Before receiving daily stimulation, half of the smokers in each group were exposed to a smoking provocation where they observed a person smoking.

After three weeks of treatment, 75 percent of participants who received the high-frequency stimulation reported cutting cigarette consumption by at least half, which was confirmed with a urine test. Of the participants who also received the provocation, 44 percent quit smoking altogether. Six months later, 35 percent of the participants who received the provocation with high-frequency stimulation treatment had quit smoking. In contrast, participants who received low-frequency or sham dTMS did not significantly decrease their smoking.

"The combination of stimulation with provocation is thought to activate the relevant networks, making it more labile for change," Zangen explained.

DARK SIDE OF ADDICTION

While scientists have long recognized the role of the reward system in addiction, presenter George Koob, director of the National Institute on Alcohol Abuse and Alcoholism and formerly of the Scripps Research Institute, described the important role the brain's stress systems also play in addiction.

Koob discussed recent animal studies pointing to the roles of the corticotropin-releasing factor system in the amygdala and the dynorphin/k-opioid system in the basal ganglia in the negative reinforcement of addiction.

"The dark side of the neurocircuitry of addiction may involve multiple stages of the addiction cycle to initiate and perpetuate the negative emotional states that drive compulsive drug-seeking," Koob said. ■

SfN Resources Help Members Navigate Career Paths, Funding Challenges

It is an exciting time to be a neuroscientist, as investments in brain research around the globe highlight the thrill and wonder of new discovery. Yet many scientists have experienced increased pressure on funding that has led to cutbacks in labs and challenges in securing employment. Recognizing these pressures, SfN is increasing its online offerings to help neuroscientists at every career stage build skills and develop methods to seek and find career guidance.

In the “Careers & Training” section on SfN.org, members can find a wealth of information about career options and opportunities to develop valuable professional skills for any career setting. The NeuroJobs Career Center features updated job postings as well as videos and articles for members interested in exploring career opportunities outside the lab, signing up and watching professional development webinars, and viewing workshops that provide information about pursuing careers in government, advocacy, academia, and other professions. Resources such as the “Joys of Science” videos are geared toward trainees and postdocs and feature seasoned neuroscientists speaking about their career paths and giving advice.

CAREERS AND MENTORSHIP

The “Career Options” section of the NeuroJobs Career Center hosts links to videos and articles that describe a variety of career paths, such as science writing and publishing, secondary education, and pharmaceutical research. These resources educate students and professionals on how to enter or transition into a specific career path by offering information on what the job entails, potential places of employment, the training needed, and the job outlook in that career area.

Also on that page, a “Careers Beyond the Bench” workshop video from Neuroscience 2013 provides information and advice for scientists who may want to pursue nonacademic careers. The panel features several neuroscientists discussing how PhD and other training translates into careers in the world of technology, the pharmaceutical industry, for-profit research and development, and the public policy arena. The video can help students and transitioning professionals develop career trajectories that can apply to a wide variety of jobs outside academia.

“You’ve been taught to think about a very difficult problem in a lot of detail and in a very thorough manner,” says panelist Bradley Voytek, professor of computational cognitive science and neuroscience at the University of

California, San Diego. “It turns out that is a relatively valuable and unique skill.”

In the changing employment market, many students are traveling down different career paths. Another professional development workshop from Neuroscience 2013, “Challenges in Neuroscience Training,” which can be found via the professional development workshops link in the “Professional Skills” section, examines the best practices for mentors training the next generation of neuroscientists to enter the job market.

For more career and mentorship content from SfN, visit the NeuroJobs Career Center online.

ADVOCACY AND FUNDING

For those neuroscientists who remain in the lab, the pressures related to adequate funding continue to create concern because advancements in neuroscience rely on consistent investment. The SfN webinar “From Congress to Your Lab: How Federal Funding Affects Your Science” aims to educate neuroscientists about the state of research funding and how to engage in science advocacy. Special guest U.S. Rep. Chaka Fattah (D-PA) discusses the critically important role that Congress plays in highlighting scientific research in the appropriations process. “It is such an important moment, I think, in the field that we can’t shirk from our responsibility to make sure that we provide appropriate financial support at the federal level,” Fattah says.

Striking a balance between advocating for science and the heavy demands of laboratory work, grant writing, and professional training is difficult but important. The webinar “Advocacy Activities: Good for You, Your Institution, and the Field” helps advocates understand how this work contributes to professional success and how to work within institutions to expand advocacy efforts. This webinar also gives scientists the tools necessary to make a case to expand advocacy efforts in the lab.

SfN provides a variety of resources for neuroscientists to learn about funding opportunities and how to secure funding for research. More information can be found on SfN.org under “Science Funding Resources.”

SfN’s expanded online resources demonstrate the Society’s dedication to supporting neuroscientists and continuing the advancement of the field during these challenging times. For more information on these and other professional development tools, visit SfN.org. ■

NIH Seeks \$4.5 Billion Over 10 Years for BRAIN Initiative

In early June, NIH embraced a long-term vision for President Barack Obama's BRAIN Initiative by calling for a decade-long \$4.5 billion investment in NIH's portion of the project. The Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative, announced by Obama in April 2013, seeks to accelerate the development and application of new technologies that will enable researchers to fill major gaps in our knowledge about the brain and provide unprecedented opportunities for exploring how the brain functions.

Though NIH is working with the Defense Advanced Research Projects Agency (DARPA) and the National Science Foundation (NSF) on the BRAIN Initiative, the estimated price tag for this latest request only includes funding for NIH's portion of the program for fiscal years 2016-2025.

The BRAIN Working Group of NIH's Advisory Committee to the Director, which has been working on a plan for NIH's portion of the initiative for more than a year, developed the cost estimate as part of a rigorous report that maps out the necessary funding commitments and makes recommendations for achieving the goals of the BRAIN Initiative. NIH Director Francis S. Collins enthusiastically accepted the group's recommendations and described the report as bold and game-changing.

"How the brain works and gives rise to our mental and intellectual lives will be the most exciting and challenging area of science in the 21st century," Collins said. "As a result of this concerted effort, new technologies will be invented, new industries spawned, and new treatments and even cures discovered for devastating disorders and diseases of the brain and nervous system."

Working group co-chairs Cornelia Bargmann of the Rockefeller University and Bill Newsome of the Stanford University School of Medicine presented a summary of the group's recommendations to the NIH director, focusing on the revised budget and the changes that were made to the group's interim report from last September. The co-chairs stated that while the deliverables set in the report are meant to be achievable within a 10-year timeframe, the milestones are meant to be aspirational and to push the field to increase the limit of discovery and possibility. Further information is available in a Q&A with Bargmann and Newsome on SfN.org.

FUNDING

The NIH report outlines an investment ramping up to \$400 million a year for fiscal years 2016-2020 to focus on technology development and \$500 million a year for

fiscal years 2020-2025 to focus on the application of those technologies. The working group emphasized that its cost estimates assume that the funds for the BRAIN Initiative will supplement NIH's existing investment in the broader spectrum of basic, translational, and clinical neuroscience research.

The BRAIN initiative kicked off in fiscal year 2014 with a \$100 million investment, with \$40 million going to NIH. The president has requested that Congress approve \$200 million for the BRAIN Initiative for fiscal year 2015, with \$100 million going to NIH.

RECOMMENDATIONS

The NIH working group recommended that over the 10-year period from 2016-2025, the initiative focus the first five years on technology development and the second five years on integrating technologies to make fundamental new discoveries about the brain. With this vision in mind, the group identified the following scientific goals as high priorities in the field:

- Identify and provide experimental access to the different brain cell types to determine their roles in health and disease.
- Generate circuit diagrams that vary in resolution from synapses to the whole brain.
- Produce a dynamic picture of the functioning brain by developing and applying improved methods for large-scale monitoring of neural activity.
- Link brain activity to behavior with precise interventional tools that change neural circuit dynamics.
- Produce conceptual foundations for understanding the biological basis of mental processes through development of new theoretical and data analysis tools.
- Develop innovative technologies to understand the human brain and treat its disorders; create and support integrated brain research networks.
- Integrate new technological and conceptual approaches produced in the other goals to discover how dynamic patterns of neural activity are transformed into cognition, emotion, perception, and action in health and disease.

The NIH report sets out a long-range timeline, but work is already underway. In December 2013, NIH announced six funding opportunities in response to the high-priority areas identified by the working group's interim report, and awards are expected to be announced this September. To read the full version of this article, visit SfN.org. ■

eNeuro, SfN's New Open-Access Journal: Excellence and Innovation

By Christophe Bernard, editor-in-chief of *eNeuro*

Publishing excellent science that can be discussed, debated, studied, and built upon is essential to our field's goal to understand the brain and nervous system. Helping to continue that important tradition is one reason why I am excited and honored to serve as the founding editor-in-chief of *eNeuro*, the new online, open-access journal from the Society for Neuroscience. I am also thrilled to work with many leading thinkers in the field to ensure *eNeuro* introduces significant innovations in publishing — innovations in the *process* of publishing and the *subject matter* that we choose to publish.

As *eNeuro* will begin accepting submissions in August and launch this fall, I wish to share its exciting emerging scientific vision, and I invite and encourage you to submit

your research to *eNeuro* in order to share your science and advance the field. With input from prominent scientists across our multidisciplinary field, *eNeuro* is developing into an innovative and important forum for communicating about discoveries in neuroscience. While its foundation will be a commitment to the excellence, rigor, and breadth for which the Society for Neuroscience is known, *eNeuro* will also have new and unique features for scientists who seek a different publishing experience and a broader range of content than traditionally appears in journals.

BROADER CONTENT, FAIR AND FAST REVIEW

Publishing decisions at *eNeuro*, like those at SfN's flagship publication, *The Journal of Neuroscience*, will be made by a team of respected, working scientists and based on scientific rather than commercial factors. By publishing in either of these respected journals, scientists will be

WHY DID SFN CREATE AN OPEN-ACCESS JOURNAL?

As scientific communication evolves, science-wide experimentation with novel publishing models is growing and new digital tools are emerging that speed communication and information processing. In thinking about where SfN is well-positioned to serve the field, the Society in fall 2012 began discussing the creation of a new online-only journal. Survey data from the field strongly validated that the neuroscience community would value SfN's development of a high-quality, open-access journal dedicated to neuroscience, and the data endorsed the role that SfN could play as a noncommercial publisher, given its reputation for scientifically excellent papers selected by working scientists.

A Council-appointed working group, drawing on key SfN leaders with experience in publishing and finance, developed the first models, which were informed by Scientific Publications and Finance Committee feedback. Council approved creation of the new online journal, *eNeuro*, in fall 2013 and facilitated editor-in-chief selections in the winter (see related article page 12). Christophe Bernard was named *eNeuro*'s first editor-in-chief in May 2014.

"The SfN Council is very excited to create a new publishing option for the rapidly expanding global neuroscience community," SfN President Carol Mason said. "The field has expressed great enthusiasm for an open-access journal from SfN, recognizing the Society's strong reputation for neuroscience publishing."

In creating *eNeuro*, SfN is establishing the first high-quality, broad-based, peer-reviewed online journal focused solely on the field of neuroscience. It will complement SfN's flagship publication, *The Journal of Neuroscience*, by providing an additional publishing venue for high-quality scientific submissions across the breadth of the field. In addition, the new online journal is expected to contribute to SfN's long-term financial stability, as revenue generated by *eNeuro* will allow SfN to invest in nonprofit programs around the world that enhance and serve the field of neuroscience.

eNeuro will begin accepting submissions this August. ■

investing in SfN’s nonprofit programs worldwide that enhance and serve the field.

eNeuro will provide a high-quality, modern publishing experience that will cover a broader range of excellent science that advances the field of neuroscience. Going beyond what some journals have elected to publish, *eNeuro* will accept a wide array of content. In addition to innovative discoveries, *eNeuro* will feature studies that focus on negative results, failure to reproduce, tools and methods, and new theories, as well as commentaries, all of which contribute significantly to advance understanding and which need a respected and visible home for discussion and debate.

eNeuro will provide a high-quality, modern publishing experience that will cover a broader range of excellent science that advances the field of neuroscience.

In addition to an expanded content base, *eNeuro* will implement a transparent, fair, and fast review process for authors. We will undertake an innovative “double blind” review experiment in which authors and reviewers are anonymous to each other during the process. Authors will also benefit from a clear and open feedback process in which they generally will not be asked for extensive additional experiments. They will receive a fact-based synthesis made by their reviewing editor (once a consensus has been reached with the reviewers) of their submission explaining why their work was accepted or rejected, and that review will be published with the article, if accepted.

RAPID PUBLISHING, EXPANDED FEATURES

eNeuro will publish studies immediately after acceptance, ensuring that the field has access to research as quickly as possible. These pre-publication manuscripts will be posted as PDFs while the composition and editing process is underway. The online environment promotes greater use of images, video, and audio, the ability to share content and articles, and features that allow communications directly with scientist-authors. Authors will be encouraged to submit significance statements as well as video “paper-casts” and visual abstracts. *eNeuro* will strive to create

an engaging and interactive experience for the reader, regardless of whether they are neuroscientists or members of the public.

ENCOURAGING FUTURE EXPERIMENTATION IN PUBLISHING — AND YOUR FEEDBACK

While *eNeuro*’s fundamental commitment to publish high-quality science will be clear and unwavering from the beginning, SfN and *eNeuro*’s emerging leadership also intends it to be a place to explore and test new ideas in scientific publishing. In addition to the double-blind review experiment, we will introduce other new features and innovations over time. I welcome your thoughts and feedback on these items at eNeuro@sfn.org. ■

SUBMIT YOUR RESEARCH



LAUNCHING NOVEMBER 2014
SUBMISSIONS OPEN IN AUGUST!

Why Choose eNeuro?

- Commitment to publish excellent science
- Broad neuroscience content
- Fair, quick evaluation by working scientists
- A noncommercial publisher
- Supports SfN programs that serve the field

eNeuro.SfN.org

SfN Announces New Editors-in-Chief for *eNeuro* and *The Journal of Neuroscience*



Christophe Bernard



Dora Angelaki

In May, the Council of the Society for Neuroscience appointed editors-in-chief for the new online, open-access journal, *eNeuro*, and the flagship publication, *The Journal of Neuroscience*. Christophe Bernard of INSERM in Marseilles, France, began his term with *eNeuro* on May 1, while Dora Angelaki of Baylor College of Medicine in Houston will start with *The Journal of Neuroscience* on January 1.

Past SfN President Moses Chao, chair of the search committee, said the panel “was very impressed by Dora Angelaki’s clear assessment of the challenges and opportunities ahead for *The Journal of Neuroscience* as it builds on historic successes and evolves over the next five years. The committee also resonated strongly with Christophe Bernard’s

compelling vision for how *eNeuro* will distinguish itself as a venue for publishing great science.”

Bernard is director of research at INSERM U751 in the Institute of Systems Neuroscience. He has also served as a reviewing editor of *Science* and *The Journal of Neuroscience*. He has served as a theme chair on the SfN Program Committee and has participated in several SfN working groups. Bernard’s term will run through December 2019.

Angelaki is a professor and chair of the Department of Neuroscience at Baylor College of Medicine. She is also a reviewing editor for *eLife* and *The Journal of Neuroscience*, and she has served on the SfN Scientific Publications and Finance committees. Her term will run from January 2015 to December 2019.

“Both Dora and Christophe represent a powerful blend of continuity and change in publishing: continuity in their commitment to publishing the highest level of science and change with respect to their visions for guiding the Society through a dynamic and evolving landscape of peer review and dissemination of excellent science,” SfN President Carol Mason said.

To learn more about *eNeuro* and *The Journal of Neuroscience*, visit SfN.org. ■

... Election Results, continued from page 1

San Francisco. At SfN, he has served as a councilor and a member of the Information Technology Committee, Finance Committee, and the Donald B. Lindsley Prize Selection Committee. Stryker’s work focuses on the critical period of the visual cortex when abnormal visual experience produces dramatic plasticity. His present research focuses on the neural circuits that regulate cortical state and their roles in adult brain plasticity.

SECRETARY-ELECT

Gina Turrigiano is a professor of biology at the Volen National Center for Complex Systems and National Center for Behavioral Genomics at Brandeis University in Waltham, Mass. Her participation with SfN has included service as a councilor, a member of the Program Committee and Young Investigator Award Selection Committee, and associate editor for *The Journal of Neuroscience*. Turrigiano’s lab has pioneered the study of homeostatic synaptic plasticity mechanisms in the mammalian central nervous system.

COUNCILORS

Barry Everitt is the director of research and professor of behavioral neuroscience in the Department of Psychology as well as provost of the Gates Cambridge Trust at the University of Cambridge. At SfN, he has chaired the Program Committee and the Jacob P. Waletzky Award Selection Committee, and he has served as a member of the Editor-in-Chief Search Committee, Committee on Committees, and Scientific Publications Committee. Everitt’s research focuses on behavioral neuroscience and investigating the corticostriatal mechanisms of motivation, learning, and memory.

Catherine Woolley is the William Deering Professor in the Department of Neurobiology at Northwestern University in Evanston, Ill. She was a member of the former Education Committee and served as an associate editor of *The Journal of Neuroscience*. Presently, she serves as a reviewing editor. Woolley’s research focuses on steroid regulation of synaptic structure and function, and sex differences in mechanisms of synaptic modulation. ■

Council Round-Up: Spring 2014 Meeting

The SfN Council met May 19-20 in Washington, DC, for its annual spring meeting. The following highlights key discussion items.

SfN FY2015 FINANCIAL OUTLOOK

Council assessed SfN's fiscal outlook, balancing the Society's sound financial footing with current external "headwinds" caused by science funding pressures. In light of these pressures, and their potential impact on SfN revenue, Council passed a flat FY2015 budget that continues important programming, makes careful reductions, and invests selectively in key opportunities. In doing so, Council balanced a desire to be intentional about providing value to members while ensuring financial stability for the coming year. Key areas of investment include the launch of *eNeuro*, the continued enhancement of online programming, and a strong technical infrastructure that enables the Society to serve its diverse, global membership.

MEMBERSHIP PRESSURES AND FOCUS ON MEMBER VALUE

As the field continues to experience external funding challenges, membership too is feeling pressure. Council is responding with a focus on creating more tangible, year-round value for members. Through the work of the Advisory Group on Member Value, Council is looking to develop a framework for delivering critical programming to segments of the membership based on their specific needs to both strengthen affiliation and to reinforce the value of joining SfN.

NEW PROGRAMMING

Council had an extended exchange with *eNeuro* Editor-in-Chief Christophe Bernard about the direction and goals of the new publication. John Maunsell, editor-in-chief of *The Journal of Neuroscience*, also reported on the continuing strength in submissions and the quality of excellent science being published.

Committees reported to Council on the programmatic activities, priorities, and strategies being conducted. With a focus on year-round value and learning, a number of committees are producing new programs in multimedia formats to enhance learning opportunities for SfN members. These resources are foundational to the online member programs platform being developed under the guidance of the Online Programs Advisory Group in collaboration with other committees, including the Professional Development Committee, Committee on Neuroscience Departments and

Programs, and Trainee Advisory Committee. The platform, which will be available early next year, will include a growing array of webinars, podcasts, and video resources initially focused on professional development and training topics.

Council is focused on creating more tangible, year-round value for members, while also ensuring SfN's financial stability.

Council remains focused on SfN's mission to communicate science to public audiences, and *BrainFacts.org* continues to meet this demand with accessible, accurate content. With more than 3.6 million page views, *BrainFacts.org* delivers compelling up-to-date information to a growing international audience (more than 47 percent of site visitors are outside the U.S.) and will soon be accessible on mobile devices with a "responsive" site. The site's social media presence continues to grow, with more than 15,300 followers on Facebook and 9,800 on Twitter.

INTERNATIONAL ELIGIBILITY FOR ELECTION OF OFFICERS

As SfN programs and activities reach into global arenas, and as international representation among the volunteer leadership continues to be a priority, Council took a historic vote to extend eligibility of all officer positions to all regular members in good standing, regardless of the country where they live and work. This move reflects SfN's commitment to serve its mission and the global neuroscience field.

SCIENTIFIC RIGOR

Council also discussed the topic of scientific rigor (including data misrepresentation, poor experimental design, and proper scientific analysis of data), and the recent coverage of this issue in both the scientific and mainstream media. Council noted the areas where SfN is well positioned to provide leadership, training, and professional development support and resources on this critical issue facing the field. Looking ahead, several events on the topic are planned for Neuroscience 2014, including a symposium chaired by NINDS Director Story Landis, "Enhancing Reproducibility of Neuroscience Studies," and the Empirical Approaches to Neuroscience and Society Symposium, "Improving Animal Models of Neuropsychiatric Disorders." Council plans to continue the conversation at its strategic planning meeting this summer. ■

Advance Your Career and Learn About the Latest Scientific Developments

Join fellow neuroscience researchers, clinicians, and advocates in Washington, DC, on November 15-19 for Neuroscience 2014, the premier venue for neuroscientists to share their research, participate in professional development, and collaborate with peers from around the world. Member registration is now open.

RESOURCES FOR YOUR CAREER

Neuroscience 2014 offers an abundance of opportunities for neuroscientists to engage in professional development and network with others in the field to advance their careers. Whether you're preparing for graduation or looking for a career transition, the annual meeting's versatile workshops and programs will help you explore potential job options and connect with others in the field.

Meeting attendees can participate in programs on how to pursue funding opportunities, get published in a journal, effectively communicate your science, and network to discover job openings. The "Careers Beyond the Bench" program will explore the range of career paths available to neuroscientists, and the "Meet the Experts" series offers a behind-the-scenes look at what influences neuroscientists as experts discuss their latest research in a personal context.

Do you want to pursue a graduate degree but can't decide on a program? Meet graduate advisers and program staff at the graduate school fair on November 16-17 and discuss their neuroscience programs. Undergraduate and graduate program staff should go to SfN.org/neurojobs for information about exhibiting at Neuroscience 2014.

THE SCIENCE BEHIND THE NEUROSCIENCE 2014 LOGO



NEUROSCIENCE
2014

Each year, the annual meeting features a unique logo that reflects the area of neuroscience relevant to the current SfN president. For Neuroscience 2014, the logo is inspired by Carol Mason's research into the development of visual pathways in mammalian brains.

Mason's lab at Columbia University investigates mechanisms of retinal axon guidance during avoidance and crossing of the midline at the optic chiasm. This crossing allows the right visual field to be processed by the left visual system in the brain, and vice versa. The logo represents the optic chiasm as a bold "X" and is a stylized view of the brain from a distinctive perspective.

To stay up to date on developments in the field, neuroscientists can attend many of the lectures, symposia, and minisymposia featured at Neuroscience 2014 and receive Continuing Medical Education (CME) credit. These programs are designed to provide an overview of neuroscience and present the latest research, reinforcing the foundational concepts that clinicians need for their practice. For more information, visit SfN.org/cme.

SYMPOSIUM HIGHLIGHT: EMPIRICAL APPROACHES TO NEUROSCIENCE AND SOCIETY

Trevor Robbins, head of cognitive neuroscience at the University of Cambridge, will chair the discussion "Improving Animal Models of Neuropsychiatric Disorders." This symposium will focus on innovative molecular, genetic, and behavioral approaches to animal models of schizophrenia and depression. Discussion will include an industry perspective on animal models and suggest new ways that collaboration

and development of animal models could translate to more effective treatment for diseases in humans.

SfN-SPONSORED SOCIALS

Socials are a great way to unwind after a day of lectures, meetings, and poster sessions. SfN will sponsor evening socials for researchers to casually meet peers with similar interests. There will be socials for researchers studying Alzheimer's and related dementia, ingestive behavior, vision, and spinal cord injuries, among others.

NEW PLANNING TOOLS AND TECHNOLOGY

In mid-October, SfN will launch the Neuroscience 2014 mobile app, which will sync personal annual meeting itineraries to the online Neuroscience Meeting Planner. The app will also allow visitors to view curated itineraries and meeting maps, add lectures to their calendars offline, and search presentations and browse abstracts. It will be available on the iPad, iPhone, and Android devices.

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

Neuroscience 2014 will also offer double the number of curated itineraries from last year. Curated itineraries help researchers navigate the annual meeting by identifying lectures and events pertaining to specific topics. This year's event will have curated itineraries covering topics including addiction research, sleep and circadian clocks, and visual cognition and perception.

The annual meeting will feature 90 dynamic posters, and researchers will be able to incorporate videos, animations, and enhanced multimedia to better display research projects and results on the 50" LCD screens.

Neuroscience 2014, SfN's 44th annual meeting, has finalized more

than 15,000 posters, along with lectures, discussions, exhibits, and events for the expected 30,000 neuroscience researchers, clinicians, and advocates. Discounted advance registration for the 2014 annual meeting closes September 17. Information about lodging, activities around Washington, DC, exhibitors, and transportation can be found on SfN.org.

Stay up to date on the latest Neuroscience 2014 activities by following us on Facebook and Twitter. Get instant alerts, notifications, and tips to navigate the annual meeting by following the annual meeting @Neurosci2014 and the Society @SfNtweets. ■



Neuroscience 2014 will feature more than 15,000 poster presentations over five days, and more than 30,000 neuroscience researchers, clinicians, and advocates are expected to descend on Washington, DC, for the annual meeting.

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