NEUROSCIENCE QUARTERLY

SUMMER 2010

"Since science has become of such importance in society, scientists should become more engaged in public life and in turn their role should be acknowledged by society at large."

—Rita Levi-Montalcini, Neurologist and Nobel Laureate

IN THIS ISSUE

SOCIETY FOR NEUROSCIENCE

Spotlight on Neuroscience Education and Training

Education and training in neuroscience — like neuroscience itself — reflects an ever-changing landscape of challenges and opportunities in funding, recruitment, curricula development, and program models. To discuss emerging trends and topics affecting neuroscience education, nearly 80 chairs, directors, faculty, and students from graduate and undergraduate neuroscience departments and programs across the United States came together on March 26 in Washington, DC.

This year's annual spring conference, *The Future of Higher Education and Training in Neuroscience: Challenges and Opportunities*, was the first since SfN's consolidation with the Association of Neuroscience Departments and Programs (ANDP) in 2009 and was organized by SfN's Committee on Neuroscience Departments and Programs (CNDP). The conference offered ample opportunity for interactive discussion and participation, and received overwhelmingly positive feedback from participants.

Keynote Speaker on Scientific Workforce

Richard Freeman, economics professor at Harvard University and American Association for the Advancement of Science fellow, opened the conference with a keynote address. Freeman spoke about the globalization of higher education and implications for graduate programs in science, engineering, and the scientific workforce.

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SfN Announces 2010 Election Results

The Society 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 2010 in San Diego. For the first time in the Society's history, an international member was selected to serve as a councilor, an event made possible by a policy change approved by SfN Council last year.

The membership elected Moses Chao, New York University, as the incoming president-elect; Darwin Berg, University of California, San Diego, as the incoming treasurer-elect; and Hollis Cline, The Scripps Research Institute, as incoming secretary-elect. The elected incoming-councilors are: Nancy Ip, Hong Kong University of Science and Technology; John Morrison, Mount Sinai School of Medicine; Sacha Nelson, Brandeis University; and Marina Picciotto, Yale University.

Officers

Moses Chao is a professor of Cell Biology, Physiology, and Neuroscience, and professor of Psychiatry at the New York University School of Medicine. He also serves as an Associate of the Center of Neural Science at New York University. His past involvement at the Society includes serving as secretary, chair of the Committee on Committees, senior editor of *The Journal of Neuroscience,* and chair of the Program Committee.

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Message from the President
From Molecules to Mind


Michael E. Goldberg, SfN President

In the 18th century, Alexander Pope proposed the "proper study of mankind is man." In the 19th century, Charles Darwin believed the way to understand man was to look to the baboon. Today, the quest to understand the physical basis of human nature has cumulated in the field of neuroscience — uniting and extending the principles of Pope and Darwin through research techniques using single cells and organisms, and animal models and humans.

The breadth and reach of neuroscience — from molecules to the mind — is exemplified by the kind of science that will be presented at Neuroscience 2010 in San Diego, the 40th annual meeting of the Society for Neuroscience. Based on the number of abstracts submitted (a near-record 16,506), we will once again host an extraordinary gathering full of the inquiry, debate, learning, and public engagement that has come to typify our meeting. I look forward to seeing you there!

A Quest for Answers

For me, the meeting is always a remarkable reminder of the myriad approaches and passions that scientists bring to their investigation. For some, it is relentless pursuit of a solution to a particular disease or an investigation into a potential therapy that could give hope to patients. It gives me great confidence, as a physician and clinician, that these discussions will again be explored and pursued in San Diego.

Significantly, these investigative paths often originate from another timeless question for many scientists, that of pure intellectual pursuit. It is the kind of inquiry that begins with the question: I wonder why? The quest for answers is a long journey, full of unexpected discoveries and, at times, sweeping breakthroughs in understanding or clinical applications. Just as Columbus — in speculating there was an easier route to India — accidently discovered a new world, as scientists, our questions, our answers, and even our failures can have great effect.

Consider, for example, the four speakers in Neuroscience 2010's Presidential Special Lecture Series, "From Molecules to Mind." Their research highlights how the study of the brain at the molecular or structural level informs basic neuroscience. In each case, basic and clinical research is bridging the gap between the unseen and the seen, often creating new therapies but always influencing understanding.

The series will begin with Martin Chalfie, who shares the 2008 Nobel Prize in Chemistry on research developing the green fluorescent protein (GFP), which literally shed light on inner workings of individual and group cells. This basic cellular research has made previously invisible processes, such as the development of nerve cells in the brain or how cancer cells spread, visible. He will speak about his latest animal research identifying genes important for the development and function of touch-sensing cells.

Moving from cells to neural interactions, Okihide Hikosaka will discuss his research showing that neuronal activity is determined not only by what a monkey sees or does, but also by whether its behavior anticipates a reward. His work demonstrates the importance motivation plays in neuronal activity.

The third speaker in the series is Pawan Sinha, whose research focuses on how the brain learns to see. His work is influenced by the research of Hubel and Wiesel, who showed that an "unused" eye stops seeing not because of physical defects, but because of impaired connections to the brain. By taking into account these findings, Sinha works to provide sight to congenitally blind children and researches how the brain processes sight.

Closing the series, Helen Mayberg's work in treating depression through deep brain stimulation (DBS) of the subgenual cingulate cortex exemplifies how basic research can inform not only clinical practice, but also create a new paradigm of thought. As a DBS pioneer, her work is shifting how we think about depression: it is not merely a chemical imbalance in the brain, but arises from the dysfunction of specific brain circuits and networks. Other psychiatric diseases also may be network and not purely chemical disorders.

Each of these researchers epitomizes the remarkable promise and scope of neuroscience, and our endless pursuit of understanding how the brain works, how it develops, what is its chemistry, and how broken brains can be fixed.

There are, of course, still many questions left to be answered. Those answers — and more questions — will come from you. It is exciting to imagine the discussions and dialogues that will unfold in San Diego this year, and we hope you will add your voice to this irreplaceable annual event.

Answering the Call

These voices must not stay only within the confines of the annual meeting or the field's journals. Without public

outreach, science as a whole will suffer. To that end, we are fortunate to have actress and advocate Glenn Close at this year's "Dialogues Between Neuroscience and Society," speaking about ending the stigma of mental illness. Close is no stranger to the struggles of mental illness: her nephew was diagnosed with schizo-affective disorder and her sister was diagnosed with bipolar disorder. As a co-creator of BringChange2Mind.org, she is challenging society to erase the stigma surrounding mental illness, to realize that mental illness is a chronic disease not different from cancer and diabetes, and is in most cases treatable. In doing so, she is also furthering a better understanding of diseases and constructing a dialogue on the impact, treatment, and nature of mental illness. Her presentation is a reminder that we, as researchers, have a role to play too. It's time we think more broadly about our impact on society and how we can educate the general public.

We can and must do a better job at reaching the people of our countries and our governments. Only an educated public can truly bring about rational support for science in our society, and we must leave our ivory towers to teach them. Fortunately, the Society is here with the tools and resources to help our American members easily and effectively engage our representatives (see page 8 for SfN's new lab tour toolkit), and we are eager to work with the national neuroscience societies of our non-American members to achieve the same goals, so that the people and legislatures of every country with members of the Society for Neuroscience can learn the importance of supporting science. It is essential to reach out throughout the year to build and maintain strong relationships with elected officials. Getting our representatives and their staffs to visit our labs is the best way to communicate the value of science and demonstrate first-hand the valuable contributions we make toward health and the economy.

It's a great story to tell, both in San Diego and in local communities. Our pursuit of science and understanding has a long, proud history. As researchers, we don't always know if our intellectual pursuits will have clinical applications, but if past performance is any measure of future success then we know that many of them surely will.

Once again this year, your discoveries will animate and expand a scientific discussion that extends through the ages, and must extend throughout the year. ■

The Journal Introduces Supplemental Data Policy Change

SfN Council has approved the elimination of supplemental data from *The Journal of Neuroscience* articles effective November 1, 2010. The change is being made in response to the exponential growth of supplemental material linked with *The Journal* articles over the past several years as well as to ensure a more consistent level of peer review across articles.

The change in policy eliminates any confusion on the part of readers as to whether or not they need to read supplemental material for a full understanding of the research and results, and ensures the article is a self-contained research report. Reviewers are currently asked to evaluate extensive amounts of supplemental material in addition to giving careful, in-depth review of manuscripts. The end result is that the review of supplemental material is often far less rigorous than the review of the body of the manuscript, according to John Maunsell, editor-in-chief of *The Journal*. "The elimination of supplemental data from *The Journal* restores a sharp distinction between material that is and is not peer-reviewed," he said. ". . . and will allow editors and reviewers to focus on the manuscript unencumbered by data that is not essential to the primary results."

"The critical characteristic of the core scientific literature is that articles are peer reviewed. Although most neuroscience journals, like *The Journal of Neuroscience*, currently peer-review supplemental material, the depth of that review is questionable," Maunsell said. He added that "the growth of supplemental material associated with a typical *JN* article appears to be exponential and if the trend were to continue, a typical article would soon be smaller than its supplemental figures, tables, and text."

Dan Johnston, chair of SfN's Scientific Publications Committee, noted that "Maunsell's proposal addressed an issue of increasing concern and was sufficiently compelling to gain the unanimous support of the Committee to recommend the policy change to Council."

After November 1, new or resubmitted manuscripts will not be allowed to include supplemental material with the submission. Manuscripts submitted prior to the cutoff date will have their accepted and peer-reviewed supplemental data hosted by *The Journal*. After the cutoff date, authors of published articles will be free to provide a URL for supplemental material to be hosted at the author's site along with a brief description of the material in a footnote. Audio or video clips that are central to the presentation of new findings will be embedded in articles. ■

Q&A

Rita Levi-Montalcini: Sharing Insight and Wisdom

Rita Levi-Montalcini,
Neurologist and Nobel Laureate
Photo by Albert Watson

Rita Levi-Montalcini, Italian neurologist and oldest living Nobel laureate, celebrated her 101st birthday this year. After pursuing studies in Italy during World War II where she was driven from her research by Nazi forces, Levi-Montalcini worked as a research associate at the Washington University in St. Louis. There, Levi-Montalcini and colleague Stanley Cohen first isolated Nerve Growth Factor (NGF) from tumor cells, the experiment that earned them the 1986 Nobel Prize. Their discovery of NGF, the protein that promotes cell growth through the stimulation of surrounding nerve tissue, plays a significant role in understanding human cancers and diseases.

Although Levi-Montalcini is officially retired, she still works as a scientist. In 2001, she was appointed by the Italian government as a senator for life. At her 100th birthday celebration in Rome, Levi-Montalcini said that at 100, she has "a mind that is superior, thanks to experience, than when I was 20."

***NQ:* Much of your early ground-breaking work was done in an enormously challenging environment — at home, without funding, during war time, and while facing persecution. What lessons can you draw from that experience about pursuing scientific research in challenging economic times?**

My family, fortunately, was able to escape from Nazi persecution. We fled to Florence and hid in a country cottage where I set up a bedroom laboratory and continued my research undaunted despite the challenging times. I have always believed that one should pursue an idea or objective regardless of the obstacles he or she encounters.

***NQ:* You have been quoted as saying that you were initially attracted to the beauty of the nervous system as an artist, rather than as a scientist. How do the fields of science and art intersect?**

Scientists and artists both have a drive to create and they share the passion and imagination in creating something.

***NQ:* You have been an inspiring role model and mentor for women scientists. What are the biggest challenges facing women in science in the 21st century?**

I believe a growing number of women are entering the field of science. I feel that the barriers of success for women in science are breaking down, although very often male subordinates tend to challenge female authority. However, women are equal to their male colleagues as far as intellectual and technical abilities. Also, women scientists who wish to have a family must balance work with family responsibilities.

***NQ*: As a senator for life in the Italian Senate, you have an important voice in policy. How has your scientific training prepared you for public life? What do you see as the role of scientists in public life?**

My scientific training was of great help for me in approaching public life due to the severe preparation — theoretical and practical. Since science has become of such importance in society, scientists should become more engaged in public life and in turn their role should be acknowledged by society at large.

***NQ*: You continue to run the European Brain Research Institute and to present new data. What advice do you have for scientists wishing to continue scientific pursuits in the later stages of their lives?**

I strongly feel that continuing scientific activity is the best way to keep your brain active and alive. ■

Read an interview conducted by Moses Chao of New York University with Levi-Montalcini: Chao MV (2010) A conversation with Rita Levi-Montalcini. Annu Rev Physiol 72:1-13.

Hear more from Levi-Montalcini and other distinguished senior neuroscientists in autobiographical interviews for *The History of Neuroscience in Autobiography* series online at www.sfn.org/hon.

Council Round-Up: Spring 2010 Meeting

The SfN Council met May 25–26 in Washington, DC, for its annual spring meeting. The following overview highlights some of the key discussion items.

SfN FY2011 Budget Approved

Rigorous financial stewardship during the recent economic downturn by SfN's leaders has helped SfN come through the recent turmoil in a relatively stable position. However, like its members and their institutions, SfN has faced an acceleration of financial challenges that affect Society revenues and operations. Council addressed these challenges and approved a budget for fiscal year 2011, which begins in July, with a moderate 2.97 percent increase in operating expenses. In order to continue to allocate necessary resources to priority professional development and international programs and to meet the needs of a changing membership, the FY2011 budget approved by Council includes numerous cost savings and reductions, including a moderate reduction of SfN's employee benefit programs. The approved FY2011 budget will allow the Society to remain focused on advancing strategic objectives, while positioning it for future growth in high quality programs for the neuroscience community.

Advocacy Strategy and NIH Funding

SfN remains focused on making a strong case for increased funding for the NIH and National Science Foundation (NSF), requesting $35 billion for NIH and $7.4 billion for NSF in FY2011, and building a foundation for long-term advocacy engagement.

President Obama's proposed budget for NIH in FY2011 is $32.2 billion, an increase of $1 billion, roughly an inflationary increase. Many federal agencies face flat or reduced funding in FY2011. For this reason, Council agreed that continuing advocacy activity should be focused on protecting and increasing the $1 billion and continuing to advocate for long-term growth for biomedical science funding.

Supplemental Materials for *The Journal of Neuroscience*

Council approved a proposal from the editor-in-chief of *The Journal of Neuroscience* and the Scientific Publications Committee to no longer review and publish supplemental materials with articles in *The Journal* beginning this fall. See article on page 3.

Responsible Conduct Working Group Proposal

A set of final recommendations for revised SfN ethics policies was presented to Council, based on two years of work by the Responsible Conduct Working Group, chaired by Past President David Van Essen. It includes replacements for the *SfN Policy on Ethics* and the *Guidelines for Responsible Conduct Regarding Scientific Communications,* as well as a new document called *Procedures for Dealing with Allegations of Unethical Scientific Conduct*. These documents will be finalized shortly and available on the SfN Web site this summer.

The *SfN Policy on Ethics* outlines the obligations of members to maintain the highest level of integrity in their scientific activities. Its principles are expanded upon in the *Guidelines for Responsible Conduct Regarding Scientific Communications*, which focuses on communications such as research manuscripts, supplemental data, abstracts, posters, oral presentations, and public electronic communications. *Procedures for Dealing with Allegations of Unethical Scientific Conduct* outlines steps taken when an ethics violation is alleged.

Professional Development Working Group Update

The Council co-chairs of the Professional Development Working Group (PDWG), Frances Jensen and Joanne Berger-Sweeney, provided a progress report on the development of a comprehensive three-year professional development plan, including short and long-term strategies for meeting the needs of SfN's varying constituencies throughout their career life cycles. Short-term, the PDWG endorsed a menu of 11 workshops for Neuroscience 2010, many on new topics. Details are available on the Neuroscience 2010 Web site. The PDWG expects to present a full set of recommendations for discussion at the Council meeting in August. ■

For more information on SfN's mission, strategic plan, and ongoing committee initiatives, visit "About SfN" at www.sfn.org.

Inside Science

Neurobiology of Social Interaction

Social neuroscience is a young interdisciplinary field aimed at identifying the biological mechanisms that produce social behaviors and studying the reciprocal effects of culture on the brain. The implications for society are striking — from understanding sociopathy to neurodevelopment disorders such as autism, this research has the potential for broad reach and broad impact.

As part of an ongoing series, "Inside Science" highlights emerging research presented at SfN's annual meeting. At Neuroscience 2009, David G. Amaral, research director of the Medical Investigation of Neurodevelopmental Disorders (MIND) Institute at the University of California, moderated a press conference exploring how the brain processes social cues. Several researchers presented studies representing the diversity of the field, ranging from synapses to human behavior.

Fiber Tracts Implicated in Emotional Processing

One way to look at the influences of the brain on social behavior is by examining the impact of known brain anomalies. Lynn Paul, California Institute of Technology, presented research on agenesis of the corpus collosum (AgCC). The corpus collosum normally contains about 190 million fibers that transfer information between brain hemispheres. In AgCC, it is partially or fully absent. This rare condition leads to impaired abilities to read social cues from facial expressions and sustain social relationships. Research into AgCC has implications for understanding and treating other disorders in which emotional processing is faulty, especially autism.

Paul reported on research comparing the accuracy of naming facial expressions in people with AgCC and normal controls; the researchers also compared eye-tracking in the two groups. People with AgCC were significantly worse than controls at identifying anger and fear but only slightly worse at identifying surprise, disgust, sadness, or neutral expressions. They were somewhat better at identifying happiness. In the eye-tracking studies, AgCC volunteers spent significantly less time looking at eye and nose regions and slightly more time looking at the mouth.

Failure to identify fearfulness in facial expressions of other people and avoiding looking at eye and nose regions are also symptoms of autism. The researchers suggest that the failure to focus on eyes when viewing faces may contribute to psychosocial impairment in AgCC and autism, and that both might involve impaired signaling between brain areas.

Of Races and Faces

Vaidehi Natu of the University of Texas at Dallas showed that when people evaluate faces, bias can exist at the neuronal level. Natu and colleagues used functional magnetic resonance imaging (fMRI) and a pattern-based classification system to analyze spatial and temporal activation in the visual areas of the ventral temporal cortex of Caucasians and Asians as they viewed Caucasian and Asian faces.

Principal components analysis of neural activation maps showed that people are better (faster and more reliable) at recognizing faces of people who are most like themselves. At best, this can make for embarrassing situations. At worst, it could lead to dire consequences, as for example in a police lineup when a person must identify a face from among several that may be difficult to distinguish. The results of this study point to the importance of spatial and temporal neural activation in recognizing and distinguishing facial characteristics.

Humans and Macaques Recognize Gender in Faces

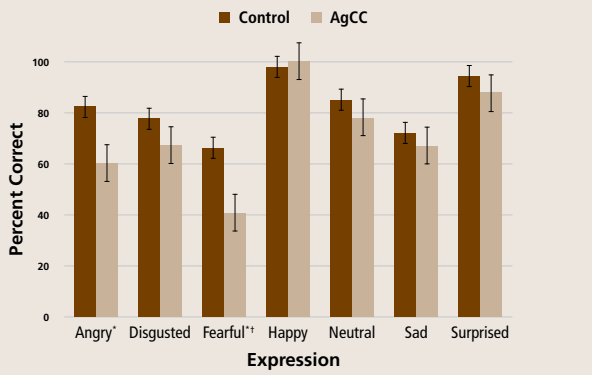
Although gender discrimination is important in macaque society, little has been known about how macaque brains process the sex of others in their species. Kari Hoffman of the Center for Vision Research at York University in Toronto reported that, like humans, macaques find it easy to tell gender by looking at a person's face.

In this study, the researchers tested the preference of ovulating female macaques for viewing male and female macaque faces. They tested the macaques as they viewed paired images (one male, one female) of faces of unfamiliar animals. By comparing preference ratios, the researchers found that female macaques showed a predilection for viewing male faces over female faces. The findings are consistent with previous studies showing that male macaques prefer to look at female macaques.

Future research will address how hormonal fluctuations and other influences may affect gender discrimination and could be relevant for understanding social information processing disorders in humans. According to Hoffman, the findings could also be applied to developing better algorithms for screening computer data for facial characteristics.

Explaining Autism at a Molecular Level

Thomas Südhof of Stanford University School of Medicine presented research suggesting autism spectrum disorders



People with agenesis of the corpus callosum have difficulty identifying certain emotions from facial expressions (asterisks). Previous studies showed that people with autism also had difficulty identifying some of these same emotions (dagger). Image courtesy of Lynn Paul, California Institute of Technology.

(ASDs) involve impaired communications between neurons at the synaptic level. Of the more than 100 genes linked to ASD, many involve proteins that function at the synapse. Some, such as neurexins, neuroligins, and cadherins, are involved in promoting contiguous relationships between neurons; others, including ubiquitinating enzymes, maintain the structure of synapses.

Autism is highly heritable and copy number variation analyses have identified gene regions that are potentially disease-related. Questions arise about the involvement of each and whether they define a pathway leading to the wide-ranging symptoms in people with this disorder, including impaired social interaction, communication, language skills, and stereotypical behaviors.

Südhof suggests at least a subset of autism cases may be due to synaptic dysfunction. He and collaborators are exploring the premise in a mouse model in which components of the neurexin/neuroligin complex are absent. These proteins promote communication across the synaptic cleft. Several families and individuals with autism have been identified who carry mutations in these genes. Mutant mice lacking the neuroligin protein display many symptoms that are similar to ASD phenotypes. The researchers hope these findings will ultimately lead to practical applications for diagnosis and treatment of ASDs and, until then, could possibly help explain the relationship of specific genes to the quality of synaptic transmission.

Williams Syndrome Reveals Neural Circuitry

Karen Berman of the National Institute of Mental Health reported differential activation of a brain circuit involved in recognizing social cues in people with Williams syndrome. This "hypersocial" disorder is caused by heterozygous deletion of a 1.6-Mb segment of human chromosome 7q11.23 normally involved in neural maturation and migration.

People with Williams syndrome have highly recognizable dysmorphic facial characteristics and unusual personality and cognitive abilities. Frequently described as autism's opposite, people with Williams syndrome are overly outgoing, empathic, and talkative, yet unaware of the traditional "safe distance" in social situations. Their language skills are extremely good, despite characteristically low IQ scores. In contrast, they display high anxiety in non-social situations, strong phobias to non-social targets (e.g., dogs, snakes), and marked impairment on visuospatial tasks.

Berman and her colleagues found less gray matter in the orbitofrontal cortex (important for social processing and social cognition) in study participants with Williams syndrome relative to controls. Furthermore, when shown pictures of fearful faces and scary scenes, Williams syndrome participants showed opposite response patterns in the amygdala (normally involved in emotional processing and response to danger) and frontal cortex compared to controls.

For example, photos of faces representing fear and anger elicited a strong response in prefrontal cortical regions of controls and barely any response in Williams syndrome volunteers. The same photos elicited a strong response in the amygdala of controls but not in Williams syndrome volunteers. These findings suggest there may be a genetic control of human social behavior that involves the neural circuitry connecting prefrontal cortical regions and the amygdala.

What's Next?

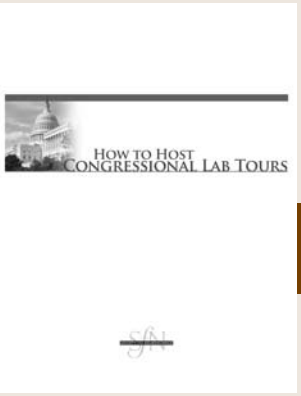
These studies are evidence of the growth of social neuroscience as a field and its importance for understanding the influence of genetics and brain biology in the development of normal and pathological social behaviors. The new findings are striking, suggesting abnormalities in brain circuits may contribute to deficits in social behavior and the processing of facial information is a fundamental part of social relationships in humans and non-human primates. Social neuroscience is set to reveal additional cellular and molecular influences on social behavior, which could lead to early identification of social impairments as well as therapeutic interventions. ■

To view the video of the press conference and related slides, go to www.sfn.org/amhighlights.

Engaging Legislators in the Lab

How can I get involved? It's a question many SfN members ask as the community works to fully realize the potential health and scientific advances possible through neuroscience. Advocacy for science is a critical way to get involved, and a growing number of U.S. members are taking part in a new effort to invite legislators to tour their labs. Lab tours are a great way to help policymakers understand the kind of research funded through national agencies, how this investment is addressing disease, sparking local and national economies, and why they must sustain strong funding. SfN is helping with a new advocacy resource — *How to Host Congressional Lab Tours*.

Legislators have many pressing issues and need to be reminded why science funding is critical. As scientists, SfN members are uniquely well-qualified to serve as an educator and advocate. In the United States, more than half a dozen colleagues have hosted these events. Join them! The new *How to Host Congressional Lab Tours* provides step-by-step instructions on how to invite your elected officials and their staff into the laboratory to showcase cutting-edge neuroscience research, while advocating for robust funding for the NIH and the National Science Foundation. ■



Get a step-by-step guide for hosting a lab tour.

www.sfn.org/labtours

Are you an international chapter interested in implementing lab tours in your country? Partner with your national society to develop a coordinated advocacy strategy and see whether and how this might be adapted to help advance your country's commitment to robust science funding.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1. Researchers from the Department of Neuroscience at the University of New Mexico thanked Rep. Martin Heinrich (D-NM) for his support of the federal dollars allocated for scientific research in the Recovery Act and urged him to continue advocating for scientific research funding in Congress.
2. Rep. Rosa DeLauro (D-CT) toured the Department of Psychiatry at Yale. (From left to right) Dr. Marina Picciotto, Rep. DeLauro, and Dr. John Krystal.
3. A University of Pittsburgh neuroscientist explains the implications of her research to Rep. Mike Doyle (D-PA) as he tours the Pittsburgh Neuroscience Center.

SfN President Testifies Before Congress

SfN President Michael Goldberg testified before the U.S. House of Representatives Subcommittee on Labor, Health and Human Services, Education, and Related Agencies on May 12, in support of funding for NIH. Goldberg highlighted investment in research through NIH, arguing that basic research leads to better health and to a stronger economy through the creation of jobs. Goldberg asked the members of the committee to appropriate $35 billion in funding for NIH in fiscal year 2011, maintain the momentum that was created by funding the American Reinvestment and Recovery Act (ARRA), and ensure America remains a leading catalyst for the global scientific enterprise.

Speaking to the critical nature of research supported by the ARRA Goldberg said, "…Basic research translates to new and better treatments of human disease, often in unexpected ways." In supplemental written testimony submitted for the *Congressional Record*, Goldberg focused on some of the ARRA-funded research successes, specifically those of post-traumatic stress disorder, age-related macular degeneration, and new treatments from nature's poisons. He stressed the importance of neuroscience and the strides made in the field as technologies continue to advance.

Read the full testimony at www.sfn.org/gpa and learn how you can get involved in advocacy to support NIH and the National Science Foundation. ■

SfN President Michael Goldberg testified before Congress in support of funding for NIH.

…Election Results, continued from page 1

Darwin Berg is a professor of Biological Sciences at the University of California, San Diego. His past involvement at the Society includes serving as a Councilor and chair of the Audit Committee.

Hollis Cline is the Hahn Professor of Cell Biology and Chemical Physiology at The Scripps Research Institute in La Jolla, California. Her past involvement at SfN includes serving as a Councilor and member of the Program Committee.

Councilors

Nancy Ip is chair professor of Biochemistry, director of the Molecular Neuroscience Center, and director of the State Key Laboratory of Molecular Neuroscience of the Hong Kong University of Science and Technology.

John Morrison is dean of Basic Sciences and the Graduate School of Biological Sciences and the Willard T.C. Johnson Professor of Geriatrics and Adult Development at the Mount Sinai School of Medicine.

Sacha Nelson is a professor in the Department of Biology at the National Center for Behavioral Genomics as well as chair of the Neuroscience Graduate Program at Brandeis University.

Marina Picciotto is the associate director of the MD/PhD program and the Charles B.G. Murphy Professor in Psychiatry at Yale University. ■

… Spotlight on Neuroscience Education and Training, continued from page 1

He presented data on the decline in the proportion of U.S. graduate students as a percentage of all PhD-level graduates globally — from 29 percent in 1970 to 12 percent in 2006 — along with the growth of PhDs awarded to international students at U.S. universities (51 percent in 2005), which has implications for U.S. scientific competitiveness. Freeman also discussed federal funding for science in the United States and commented on the potential duration of the current recession and mechanisms that NIH and universities might employ to manage the impact of anticipated loss of stimulus funds. He suggested a recession is the ideal time for students to invest in higher education; however, given limits to academic jobs, he challenged the audience to prepare and send graduates and postdocs to other careers at which they can apply their neuroscience knowledge and skills.

The Role of the Web and Social Networks

Terrance Barkan, an expert on social media strategy, led a panel on the use of the Web and social media for student recruitment and training program activities. He noted that although all universities use the Internet to communicate program information to prospective students, few have responded to the importance of commonly used social media, such as Facebook, YouTube, and LinkedIn. Barkan advised universities, whether or not they have a social media strategy, to prepare for developments in an environment where communication is instantaneous.

Three neuroscience graduate students shared their experience using the Web and social media to select graduate schools, including reaching out to students enrolled in programs they were considering. The panelists highlighted the need for programs to provide comprehensive and up-to-date information online, not only about academics and faculty, but also about cost of living and other aspects of life outside the classroom and lab. They emphasized that students want to know what makes a university or program unique.

Conference participants engaged in a lively discussion on the necessity and challenges of maintaining boundaries between the social and professional aspects of the social media world, while recognizing that social media plays an important supplementary role for many students when making their graduate education decisions.

Program Improvement Through Self-Assessment and Review

From 2001 to 2005, the Carnegie Initiative on the Doctorate (CID) examined the process of doctoral education across six disciplines, including neuroscience. Representatives from several neuroscience departments who participated in the project described how they applied the Carnegie Program Review (CPR) process to their programs. CID programs engaged faculty, students, and other stakeholders in discussions about program goals, and brought together representatives from various programs within the same discipline, and later across different disciplines. The CID process facilitated significant input from students, and one result was the addition of professional development components to many neuroscience program curricula — including courses on ethics, grant writing, and presentation skills. These components improved overall satisfaction and fostered a more cohesive intellectual community among faculty and students.

Panelists recommended that SfN's Institutional Program (IP) members build on the CID progress by adopting and implementing the CPR at their institutions and suggested creating mechanisms for networking and resource sharing on this topic.

Varying Models of Neuroscience Education

A recent survey of SfN's IP members revealed that nearly 60 percent of graduate programs matriculate PhD candidates directly into a neuroscience track, while 20 percent start students in an undifferentiated biomedical sciences track. The remaining 20 percent of programs provide a mix of

Nearly 80 participants in the Spring NDP Conference actively engaged in panel and small group discussions.

View slide presentations and conference program at www.sfn.org/ndp.

What Did Attendees Say?

"... I returned home with a few ideas for improving my Department's small graduate program. The willingness of others to share their insights, programmatic tactics and common concerns made the meeting worthwhile."

"...we felt this was really valuable and worth our time; this gives us high hopes for CNDP playing an active and effective role."

both options. Representatives from several neuroscience graduate programs spoke about the impact of these trends. Albert Berrebi from the West Virginia University School of Medicine, Rita Balice-Gordon from the University of Pennsylvania, and Richard Mains from the University of Connecticut Health Center, described the curriculum tracks and core requirements for neuroscience trainees at their institutions, including requirements for students in some programs to spend their first year studying a core biomedical curriculum.

Panelists noted that differentiated and undifferentiated programs have specific advantages and disadvantages related to such issues as recruitment and length of time to graduation. NIH panelists noted there is no "official NIH position" or preconceived preference about the best way to train students, but that the National Institute of General Medical Sciences (NIGMS) is preparing to analyze their training programs and welcomes input. Several conference attendees shared their institutional experiences and models. Others suggested SfN and the CNDP facilitate the ongoing dialogue and sharing of resources among universities about effective curricula for neuroscience graduate programs.

Enhancing Diversity

The final panel of the day addressed issues related to recruitment and retention of underrepresented groups. Panelists offered approaches they have used in response to NIH training grants requirements that grant applicants include a plan for recruiting and collecting data about students from these groups. Joel Hockensmith, assistant dean for Graduate Research and Training at the University of Virginia School of Medicine, described how his office maintains several databases to support training grant applications and how they have been able to collect critical data without violating privacy regulations, particularly with regard to disabilities.

Alison Cole, program director at NIGMS, provided insight into the latest NIH requirements and guidelines for including diversity in training grant applications. She emphasized that NIH is still working through the new requirements and is open to ideas about how best to approach diversity recruitment and retention issues as part of future grant applications. Attendees found great value in having NIH representatives engaged in this session.

Additional Conference Activities

The conference also included presentations by the President of the Faculty for Undergraduate Neuroscience (www.funfaculty.org) and the Incoming Chair of the Network of European Neuroscience Schools (www.fens.org/nens). These representatives of SfN's strategic partners shared their organizations' current initiatives and proposed opportunities for collaboration with SfN, CNDP, and IP members.

A new conference feature, small-group lunchtime discussions facilitated by CNDP members, encouraged networking among program leaders and generated enthusiastic participation and feedback. Groups brainstormed ideas about future directions for CNDP and IP membership benefits. SfN and CNDP included these ideas subsequently in a survey to attendees and the broader neuroscience training community to solicit input on prioritization, and will consider feedback when developing programs for IP members. ■

Become an Institutional Program Member

SfN has nearly 170 Institutional Program (IP) members, representing undergraduate and advanced degree programs in neuroscience and neuroscience-related disciplines in the United States and Canada. IP member benefits continue to evolve and currently include a listing in the online searchable directory of neuroscience training programs, inclusion in the biennial survey of neuroscience programs, and communications access to students and other IP members. Visit www.sfn.org/IP for a complete list of benefits.

Save the Date! 2011 Spring Conference of Neuroscience Departments and Programs — **March 25, 2011**

SfN Promotes Equity and Diversity in Academia

Representation and advancement of women and underrepresented minorities (URMs) remains a challenge in academic science and engineering careers; the field of neuroscience and other biomedical science disciplines share the same hurdle. With the help of a National Science Foundation (NSF) ADVANCE/PAID grant, SfN has become a proactive partner in addressing equity and inclusion within academia and a contributor to the development of a more diverse science workforce.

The Society introduced its Increasing Women in Neuroscience (IWiN) project with the first of five workshops held at SfN headquarters on April 29–30. Twenty-four participants representing nine universities, including workshop faculty, engaged in highly interactive sessions focused on recruiting and promoting women and URM faculty in neuroscience and related departments. Leadership teams from five universities participated.

Framing the Environment

Led by co-chairs of SfN's Professional Development Committee (PDC) and IWiN co-Principal Investigators, Jill Becker, University of Michigan, and Anne Etgen, Albert Einstein College of Medicine, the workshop addressed organizational change, core values, power and influence, culture and norms, climate, and boundaries. Speakers also presented strategies to improve recruitment, promotion, and the working climate for women and URMs in neuroscience and related departments.

During the overview, Becker cited research from a 2007 Association for Neuroscience Departments and Programs survey finding that of the 52 percent of women graduate students in neuroscience, only 21-23 percent of these women become full professors. Termed the "leaky pipeline," the phenomenon of women and URMs dropping out at every transition point in academia, particularly the transition to tenured faculty, is the basis of the IWiN workshops.

Unconscious Biases

Pamela Raymond, chair of Molecular, Cellular and Developmental Biology, at the University of Michigan, and a founding member of the STRIDE Committee (a committee to increase recruitment and hiring of women and URMs), discussed schemas — expectations or stereotypes — and how they influence our judgments of others, regardless of our own group. "It is tempting to believe that discrimination against certain groups is a thing of the past, or is only practiced by a small set of uninformed people," noted Raymond. "Research shows that we all — regardless of the social groups we belong to — perceive and treat people differently based on their social group."

> *"The workshop was amazingly effective at highlighting key issues relevant not only to the recruitment and mentoring of women faculty, but to the essential dynamics of a successful academic science department."*
>
> *— Alan F. Sved, University of Pittsburgh*

Pamela Raymond, University of Michigan, facilitates a question and answer session on unconscious bias.

Raymond suggested there is a need to overcome the unconscious biases that influence us, especially in the evaluation of potential candidates for hiring and tenure. In small groups, participants discussed their own unconscious biases and strategies to break the cycle of schemas and reported out on assigned scenarios and brainstormed strategies to minimize evaluation bias. Open searches for new faculty, where an advertisement is placed without mention of a specific sub-field, were recommended by Raymond as a method to increase diversity among department faculty.

Building a Supportive Environment

Thomas J. Carew, Bren Professor, and chair, Department of Neurobiology and Behavior at the University of California, Irvine, and past SfN president, addressed supporting new faculty with mentoring and career advising to prepare them for the tenure process. He spoke of the important role a department head plays as an advisor when orienting new faculty. As to the essential elements of career advice, Carew cited scholarship (start early, collaborate, and diversify the portfolio), teaching (use advisors for feedback and establish

Small group discussions engaged workshop participants (including workshop faculty, SfN Past President Tom Carew, and SfN President-Elect Susan Amara) in lively brainstorming and hands-on exercises around topics of recruitment and promotion.

courses you "own"), and service (serve on committees and learn policies and procedures, but don't over commit).

Diana Bilimoria, professor of Organizational Behavior at Case Western University, relied on her research with C. Greer Jordan, *A Good Place to Do Science: An Exploratory Case Study of an Academic Science Department*, to inform her session on climate and culture in academic departments. Bilimoria led breakout discussions to explore the meaning of gender equity, moving from compliance to inclusion, and the characteristics of environments that support gender equity.

Role Play Brings Home the Points

The highlight of the workshop was an interactive professional theater performance, "The Fence," by the University of Michigan Center for Research on Learning and Teaching (CRLT) Players Theatre Program. The CRLT Players, partially funded by the NSF ADVANCE/PAID program at the University of Michigan, develops and performs sketches that engage faculty and graduate students in discussions of multicultural teaching and learning and institutional climate.

The play simulated a neuroscience department executive committee meeting to discuss tenure for a woman faculty member. Workshop participants identified moments when they perceived problems in the conversation or the meeting environment, or when they had a strong reaction to something that occurred in the committee's interaction. Participants also had an opportunity to intervene in the performance and share feedback discussion points.

Taking It Home

Identifying follow-up actions served as the final phase of the workshop. Becker discussed five factors affecting organizational change, and provided an outline for creating and implementing a process for change at the home institutions: (1) shaping the goal — what needs to be changed and addressing resistance; (2) forming a team — key individuals and important connections; (3) operating as a team — working together toward the goal; (4) defining the environment that will let you know when you have reached your goal; and (5) maintaining the accomplishment post-project.

An important part of the IWiN project is the follow-up ("echo") workshop to be led by participating department chairs for faculty and leaders at their home institutions. To support these workshops and to foster continued networking among the IWiN workshop participants, SfN launched the new IWiN Forum on the SfN Web site. The forum allows workshop participants to dialogue on challenges faced and lessons learned during implementation of their own workshops. Participants are encouraged to use the site to get feedback on individual plans to improve the recruitment, advancement, and work climate for women and URM faculty in neuroscience and related departments. ■

Visit www.sfn.org/IWiN for more information and upcoming workshops.

Emerging Science, Collaboration, and Networking

The 40th annual meeting of the Society for Neuroscience will take place November 13–17 at the San Diego Convention Center. Thousands of the world's foremost brain researchers, clinicians, and experts will gather at Neuroscience 2010 to present the latest research findings, innovative topics, and multifaceted perspectives spanning the neuroscience discipline. With a near record of 16,506 abstracts submitted, this year brings inspired collaboration and emerging science on the brain, spinal cord, and nervous system to San Diego.

Breakthrough Findings

With 13 special lectures, 21 symposia, and 25 minisymposia selected by the Program Committee, Neuroscience 2010 will provide unlimited opportunities for learning, collaboration, and enrichment. Attendees can expect "a chance to hear internationally renowned leaders in neuroscience including special lecturers who describe the latest advances in their respective fields," noted Program Committee Chair Robert Greene. In addition to Continuing Medical Education (CME) credit, this year's special lectures also "offer a chance to see in-depth, state-of-the-art, presentations that are well organized and focused around high-impact topics from leaders and rising stars."

From Molecules to Mind: 2010 Presidential Special Lectures

- Martin Chalfie, Columbia University: Adventures in Non-Translational Research: Neuronal Differentiation and Mechanosensory Transduction in *C. elegans*
- Okihide Hikosaka, National Eye Institute: Motivational Neuronal Circuits for Value, Salience, and Information
- Pawan Sinha, Massachusetts Institute of Technology: Learning to See Late in Life
- Helen S. Mayberg, Emory University: Tuning Depression Circuits using Deep Brain Stimulation

Enhancing Nanosymposia through Collaboration

Introduced this year, the online Nanosymposium Topic Matching Forum sparked successful collaborations by creating a venue for attendees to share, form, and suggest the composition of their own sessions. Taking the place of slide sessions in 2009, Nanosymposia have become "an exciting and evolving process which allows members to self assemble their latest work together with their colleagues around a common theme," said Greene. This year, Neuroscience 2010 features 107 Nanosymposia.

Make the Most of Your Time

Make navigating Neuroscience 2010 easy by pre-planning with the help of SfN's resources such as the Neuroscience Meeting Planner (NMP) and the 2010 *Preliminary Program*. "Although the annual meeting is big, even overwhelmingly so, it is well organized and well integrated with the NMP," emphasized Greene. "Attendees can make their own personalized meeting within the meeting, being as selective or broad as they like with the only constraint being time. Putting some thought into pre-meeting planning can really pay off." Browse the 2010 scientific content, workshops, meetings, and events to organize your meeting experience. The NMP, available online mid-August, contains the full text of abstracts and allows attendees to plan an itinerary for the annual meeting. ■

Continuing Medical Education

Offering attendees the opportunity to earn Continuing Medical Education (CME) credits is a priority at the Society's annual meeting. This year, attendees will be offered the opportunity to earn up to *36 AMA PRA Category 1 Credits*™ by attending lectures, symposia, and minisymposia. CME registration must be completed before or during the meeting.

For more information, visit www.sfn.org/cme

Featured Lectures

Dialogues Between Neuroscience and Society
The 2010 Dialogues Series Lecture "Bringing Change to Mind" will be presented by actress and mental health advocate Glenn Close.

Peter and Patricia Gruber Lecture
Brain Circuits for Active Vision
Robert H. Wurtz, National Eye Institute/ National Institutes of Health

David Kopf Lecture on Neuroethics
The Neuroscience Revolution and Society
Henry T. Greely, Stanford University

Albert and Ellen Grass Lecture
Dendrites, From Form to Function
Lily Jan and Yuh Nung Jan, University of California, San Francisco

History of Neuroscience Lecture
Cell and Molecular Neurobiology: Antecedents and Achievements
Victor P. Whittaker, Max Planck Institute for Biophysical Chemistry

Fred Kavli Distinguished International Neuroscientist Lecture
Understanding Sound Processing in the Auditory System: Advances Rooted in the Genetic Approach
Christine Petit, College de France and Institut Pasteur

Special Lectures

Theme A: Development

Connecting Motor Circuits
Silvia Arber, Biozentrum, University of Basel

Rewiring the Brain: Activity-Dependent Neurotransmitter Specification
Nicholas C. Spitzer, University of California, San Diego

Theme B: Neural Excitability, Synapses, and Glia: Cellular Mechanisms

Joining the Dots: Epigenetics, Plasticity and the Circadian Clock
Paolo Sassone-Corsi, University of California, Irvine

Architecture, Symmetry and Mechanism of Ionotropic Glutamate Receptors
Eric Gouaux, Oregon Health & Science University

Theme C: Disorders of the Nervous System

Amyloid Imaging: Impact on the Study of Alzheimer's Disease
William E. Klunk, Western Psychiatric Institute & Clinic

Special Lecture (Title TBD)
Pamela Sklar, Massachusetts General Hospital/Broad Institute

Theme D: Sensory and Motor Systems

How Do I Smell? A Guided Tour of Human and Insect Olfaction
Leslie B. Vosshall, Rockefeller University, Howard Hughes Medical Institute

Modern Genetic and Viral Tools for the Dissection of Neural Circuits
Edward M. Callaway, The Salk Institute for Biological Studies

Theme E: Homeostatic and Neuroendocrine Systems

Neurobiology of Social Bonding and Monogamy: Implications for Autism Spectrum Disorders
Larry J. Young, Emory University

Neurogenetics of Circadian Clocks in Mammals
Joseph S. Takahashi, University of Texas Southwestern Medical Center, Howard Hughes Medical Institute

Theme F: Cognition and Behavior

Learning and Memory Mechanisms in Songbirds, and Humans — Sleep On It!
Daniel Margoliash, University of Chicago

Lasting Traces: How H.M. Shaped the Science of Memory
Suzanne Corkin, Massachusetts Institute of Technology

Theme G: Novel Methods and Technology Development

Genetic Dissection of the Mouse Brain: Toward a 21st Century Brain Pharmacology
Nathaniel Heintz, Rockefeller University, Howard Hughes Medical Institute

NEUROSCIENCE QUARTERLY

Published quarterly by the Society for Neuroscience

Circulation: 40,400

Neuroscience Quarterly is printed on New Leaf Reincarnation Matte made from 100% recycled fiber and 50% post-consumer waste, printed with soy inks, and processed chlorine free. By using this environmental paper, SfN saved the following resources:

25	trees
11,306	gallons of water
686	pounds of solid waste
2,348	pounds of hazardous effluent

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