NEUROSCIENCE QUARTERLY

SUMMER 2006

"The times demand that we as neuroscientists constantly advocate for the funding necessary to achieve the exciting breakthroughs envisioned by the Roadmap and the Blueprint, and enabled by the Human Genome Project."

– SfN President Stephen Heinemann

(see page 2)

IN THIS ISSUE

SfN Celebrates Opening of Its New Headquarters Building in Washington

Stephen Heinemann and Edward Perl, SfN's first president, cut ribbon, formally opening the building.

The Society for Neuroscience celebrated its new headquarters building and office space in Washington, DC, with an opening gala on May 5. Approximately 150 guests attended, including past presidents, representatives from the Spanish and Italian embassies, SfN committee chairs, NIH directors, and other leaders in the sciences.

The evening's events began in the building lobby, where SfN President Stephen Heinemann welcomed attendees to the dedication ceremony. "This new building represents many things to the Society. Among the most important is that it embodies the vision and mission shared by all of SfN's leaders," said Heinemann. "This building is a sign that neuroscience and the Society are committed for the long term to supporting and playing a role in the research enterprise, and to maintaining a strong presence in our nation's Capital."

Past President Carol Barnes, head of SfN's Real Estate Committee, spoke about the environmentally responsible strategies behind the headquarters' construction. "As the chair of the Society's real estate committee, I am very pleased that this building reflects the personal values of environmental responsibility that we as neuroscientists feel are important. It also serves as a visible symbol in our nation's capital of the excitement of neuroscience — something about which all SfN members are very proud," she explained.

Heinemann and Edward Perl, SfN's first president in 1969, then cut a ribbon, formally opening the building.

A reception in SfN's office space gave attendees an opportunity to tour the ninth through eleventh floors and chat with colleagues and SfN staff over drinks and hors d'oeuvres. Also, they were able to see and learn about the three-story, three-dimensional mural hanging in the space's central stairwell (see article on page 4). The mural, dedicated at the gala by SfN President Stephen Heinemann, is based on a drawing of the mouse neocortex by Santiago Ramón y Cajal, who shared the Nobel Prize for Physiology and Medicine with Camillo Golgi in 1906. This year marks the

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SOCIETY FOR NEUROSCIENCE

Message from the President

Bedside to Bench to Bedside: Redefining Clinical and Basic Science Research

Stephen Heinemann, SfN President

Some basic scientists worry that funding is biased toward translational research - focused only on curing disease rather than basic science — creating an artificial tension between basic and clinical research. Rather, these fields actually inform each other and are both important. This is illustrated when scientists start with a human disease, look for a gene, then make animal models and do experiments that result in treatments for patients. Increasingly, clinical research and basic science are converging. We should be mindful of this as we go about our research, and think about the enormous progress now possible through cross-fertilization.

A classic contemporary example of how the study of human genetics informs basic science, and helps science understand and find better treatments for disease, is the story of Michael Brown and Joseph Goldstein, who won the Nobel Prize in Medicine or Physiology in 1985 for their work on the cholesterol pathway.

In studies of cultured cells of normal people and those with inherited high cholesterol, Brown and Goldstein found that the cells of patients with the most severe form of the disease completely lacked functional low-density lipoprotein (LDL) receptors. The underlying mechanism of severe hereditary familial high cholesterol was determined to be a complete, or partial, lack of functional LDL-receptors, leading to increased levels of cholesterol in the blood which subsequently may accumulate in the wall of arteries causing atherosclerosis and eventually a heart attack or a stroke. Knowing this, statins were developed and revolutionized the treatment of high cholesterol.

The talks to be delivered by the four presidential lecturers at Neuroscience 2006 in Atlanta also will highlight how the study of human genetics informs basic neuroscience and tells us more about human disease. In each case, research is leading to therapies for devastating neurological disorders that now have no treatment.

In the fall of 1983 as a resident in child neurology, Huda Zoghbi began to notice in young girls an obscure disorder characterized by loss of speech and constant hand-wringing. Within a few weeks, she had found seven patients with the disorder known as Rett syndrome. Two years after first encountering patients with this disorder, Zoghbi interrupted her clinical career for intense genetics training in the hopes of understanding the causes of diseases like Rett syndrome. After establishing her lab in 1988, she began hunting for the gene on the X chromosome and collected more than 200 patient samples.

In 1999, Zoghbi and her collaborators discovered that Rett syndrome is caused by mutations in the gene encoding methyl-CpG-binding protein 2 (MECP2) located on the X chromosome. Studies now show that MECP2 is important for synaptic plasticity. Furthermore, scientists are now beginning to find the gene's targets which will help link molecules to specific neuronal function. Ultimately, Zoghbi hopes to target these pathways to treat patients. Her talk is titled "Rett Syndrome and MECP2: Gateway to Postnatal Neuropsychiatric Disorders." She's a Howard Hughes Medical Institute investigator at Baylor College of Medicine.

One of Zoghbi's collaborators is another 2006 presidential lecturer. Harry Orr, a geneticist at the University of Minnesota, heads a team interested in unraveling genes that encode proteins critical for proper neuronal function. His primary approach is to study genes that have a role in neurodegeneration. Orr studies the molecular basis of spinocerebellar ataxia type 1 (SCA1), one of nine polyglutamine disorders. SCA1 damages neurons in the brain's cerebellum, resulting in a loss of muscle control. It usually strikes during the prime of life, cruelly rendering its victims unable to walk and speak before killing them within 10 to 20 years of onset.

The starting point for these genetic studies was the clinical characterization of the disease in patients by other researchers. Orr employed an approach often called positional cloning in which DNA was collected from 200 family members with the disease. Genetics were used to determine the inheritance pattern. DNA markers and linkage analysis then determined the chromosome and place where the gene is located. Molecular approaches then cloned the gene. In this case, the cause of SCA1 was found to be a mutation on a gene located on chromo-

some 6. Orr then made several mouse models for the disease that have helped to understand basic aspects of the disease process and normal function of the protein _ findings that have led to the identification of potential therapeutic approaches. Orr's talk is titled "Neurodegenerative Disorders: Linking Basic and Clinical Neurosciences."

Sangram Sisodia of the University of Chicago will discuss advances made through the study of the "Molecular Neurobiology of Alzheimer's Disease," initially involving families in which the disease was inherited. The first genetic studies conducted during the late 1980s showed genetic markers for the disease-causing beta-amyloid precursor protein (APP) on chromosome 21. Later, genes known as presenilin 1 (PSEN1) and presenilin 2 (PSEN2) were identified.

Although mutations in PSEN and APP genes are seen only in the relatively rare cases of familial Alzheimer's that occur early, the symptoms and laboratory test features of these individuals are indistinguishable from the larger AD population whose disease begins after the age 60. With this in mind, Sisodia and others have focused their efforts on clarifying the dysfunction of mutant APP and presenelin protein product variants in cellular models and in transgenic mice. They have found that introducing these genes into the mouse genome leads to beta amyloid deposits in the brain and in some cases memory deficits. Researchers are now testing several approaches to treat the disease. These include antibody strategies; a variety of compounds; and the effect of enriched environments on reducing beta amyloid levels. Eventually, these efforts are expected to lead to new drugs for humans that will alleviate or forestall the ravages of this devastating disorder.

Finally, Peter Carmeliet of the University of Leuven, Flanders Interuniversity Institute of Biotechnology, Belgium, will discuss "The Emerging Importance of the Neuro-Vascular Link in Health and Disease." While the starting point for his studies was mouse genetics, his work also shows how the interplay between clinical and basic science can lead to new therapies. His research team started with the mouse gene, then went to human genetics, and then back to the mouse and rat to evaluate the therapeutic potential.

Five years ago, Carmeliet and his colleagues found that mutations in a gene known for triggering new blood vessel growth were linked to symptoms much like amyotropic lateral sclerosis (ALS) in lab animals. Normally, the gene for vascular endothelial growth factor (VEGF) is responsible for growth of new blood vessels. But the altered expression of the gene produced progressively weaker muscles and spinal cord injury similar to ALS. Studies of some 2,000 people found three slightly different versions of the gene which appeared to cause lowered levels of VEGF protein in the body. What's more, the low VEGF levels corresponded with a higher risk of developing ALS.

Recently, Carmeliet has shown that VEGF is critical to nervous system development. He is now exploring the possibility of VEGF gene therapy for ALS. Preclinical animal studies have shown that this therapy can slow the onset of disease and increase life expectancy by 30 percent. Clinical trials are expected to start within a year.

As these examples show, the opportunity to turn clinical genetics and basic science into new therapies is very real. And collaboration across disciplines — aided by emerging technologies such as genomic mapping, increasingly sophisticated imaging tools, and animal models — is leading to profound insights into the nervous system and how it works.

This type of collaboration is already envisioned in the National Institutes of Health's new strategies for conquering disease. The Neuroscience Blueprint, which includes the work of 15 National Institutes of Health (NIH) institutes and centers, and the Roadmap discuss the need for new research paradigms and closing the divide between basic and clinical research.

The Blueprint highlights the fact that discovering the changes in genes and proteins associated with health and disease is already providing targets for new treatments, for biomarkers, and for diagnostic tests, and will ultimately provide measures of risk that can inform strategies for prevention of nervous system diseases. It also notes that with the mapping of the human genome, we have unprecedented traction for understanding how, where, and when genetic variation confers risk for disease.

One of the major NIH Roadmap themes emphasizes

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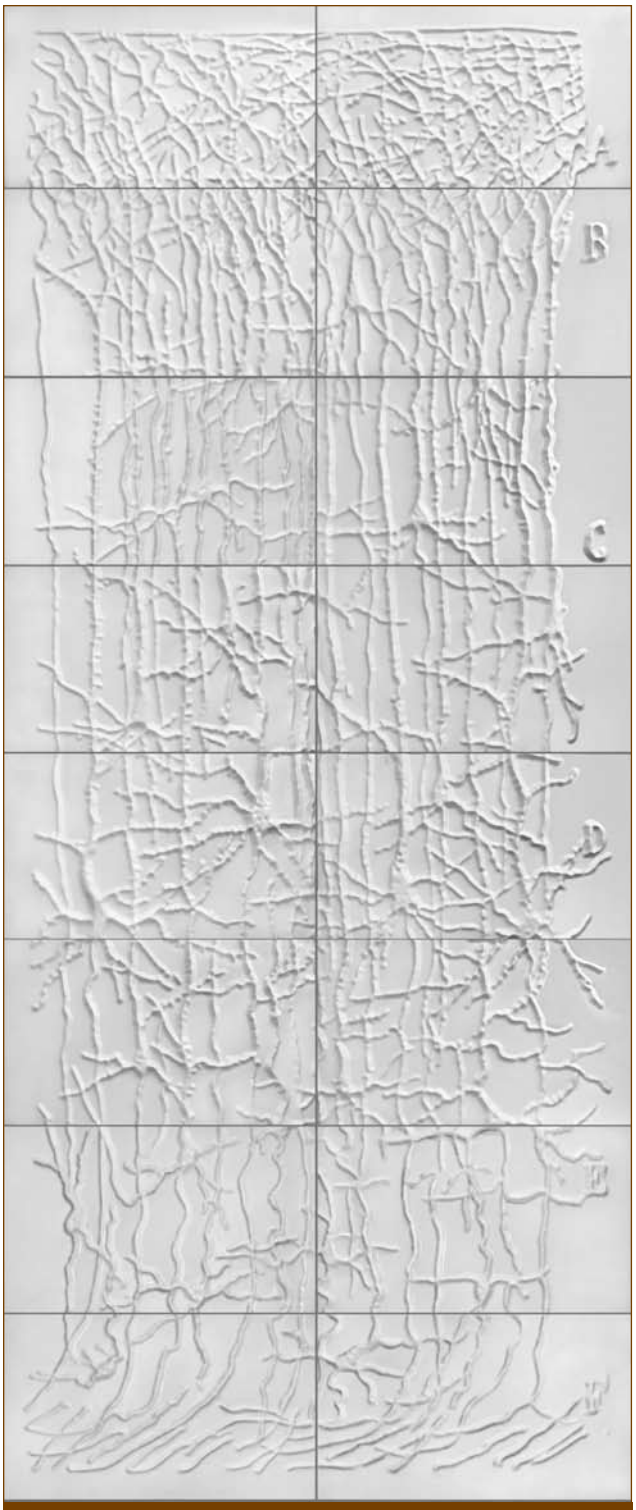
Cajal Mural Dedicated in Society's New Office Space

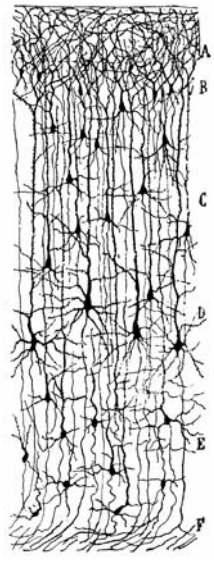


SfN's Cajal mural

SfN President Stephen Heinemann dedicated a three-story mural based on a drawing by Santiago Ramón y Cajal at a May 5 gala celebrating the opening of the Society's new headquarters building (see article on page 1). The mural that hangs in the central stairwell of SfN's office space honors the legacy of Cajal on the 100th anniversary on his winning of the Nobel Prize for Physiology and Medicine in 1906 for his work on the structure of the nervous system. He shared the prize with Camillo Golgi, who invented the method of silver staining that Cajal used to observe and draw neurons.

"It is very fitting that on the 100th anniversary of their Nobel Prize that this mural and building dedication serve to commemorate this important event in the history of neuroscience," said Past President Carol Barnes in her opening remarks.

These accurate drawings provided the foundation of modern neuroanatomy by showing that the nervous system is composed of individual nerve cells rather than — as was widely believed at the time — a web of continuous elements. Cajal speculated that these neurons communicated with each other via junctions later called "synapses."



Cajal's drawing

The drawing upon which the mural is based first appeared as figure 844 in volume two, part two of Cajal's *Textura del Sistema Nervioso del Hombre y de los Vertebrados*, published in Madrid in 1904. The image is that of the six layers of the mouse neocortex, labeled A through F in Cajal's hand.

Cajal was born in 1852 in Petilla de Aragón, a village in northeast Spain. He graduated from the medical school of Zaragoza in 1873 before being drafted as a Spanish army medical officer and sent

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Neuroscience 2006 Features New Scheduling and Navigation Aids, Exciting Lineup of Lectures, Symposia, and Minisymposia

The 36th annual meeting of the Society for Neuroscience will take place Saturday, Oct. 14 through Wednesday, Oct. 18 at the Georgia World Congress Center in Atlanta. This year, 14,229 abstracts have been submitted for the meeting. Scientists from around the world will gather to exchange ideas about cutting-edge research on the brain, spinal cord, and nervous system.

In an effort to encourage and facilitate more opportunities for socializing and networking, no evening lectures will be scheduled at Neuroscience 2006. This decision was made on the recommendation of SfN's Program Committee and approved by Council in response to member feedback.

Though all scientific content will be complete by 6:15 p.m. each day, this new scheduling does not mark a reduction in lectures and events. Each day the hour of 5:15 to 6:15 p.m. will be devoted exclusively to one of the four Presidential Special Lectures (see article on page 2). These lectures will now consist of a 45-minute lecture and a 15-minute question-and-answer session with the audience.

In the past, social events were scheduled only on Mondays and Tuesdays. This year, Sunday evening will also be given over to these events. The additional day is intended to allow attendees a chance to attend more non-scientific social events.

Continuing the success of last year's debut "Dialogues between Neuroscience and Society" lecture with the Dalai Lama of Tibet, world-renowned architect Frank Gehry will give a talk titled "Architecture & Perception" about how his ideas on how the mind works influence his approach to architectural design.

Neuroscience 2006 also marks the second year of the NeuroJobs Career Center, an on-site career fair for neuroscientists and employers. Attendees and exhibitors will be able to access job listings and schedule interviews with participating employers during the meeting. This year's NeuroJobs Career Center will offer more computer consoles and private meeting rooms than were available last year.

Lectures, Symposia Reflect Connections Among Neuroscience Disciplines

The Program Committee selected 13 special lectures, 21 symposia, and 24 minisymposia in areas ranging from studies of basic neural function and circuitry to the role of molecular defects in neurological and psychiatric

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Coalition for Animal Research Education Meets in Washington, DC

The Coalition for Animal Research Education (CARE) met in Washington, DC on May 17, 2006 to discuss outreach strategies, action items, and future ideas to advance public understanding of the benefits of responsible animal research.

Attendees talked about several approaches to animal research advocacy, such as a public relations campaign, symposia at science teacher meetings, and letter-writing campaigns to the media. They were briefed on a new animal-research focused Web site being created by NIH's Office of Science Education. This Web site, which will be online by the beginning of the next school year, will be a very useful tool for teachers hoping to bring animal research topics into their classrooms.

Organizations participating in CARE include the Society for Neuroscience, States United for Biomedical Research, the Federation of American Societies for Experimental Biology, Society on Toxicology, American Physiological Society, and AAAS. The meeting took place one day after the conclusion of the National Association for Biomedical Research Leadership Conference, also in Washington, allowing those already in the area to stay and contribute to this important initiative. Topics discussed at this meeting included animal legal rights and animal rights terrorism. ■

SfN Contributes to Special Neuroscience Education Issue of ASCB Journal

A special issue of CBE—Life Sciences Education (CBE-LSE), the journal of the American Society for Cell Biology (ASCB), focuses on resources, innovative teaching methods, and research related to neuroscience education. For this issue, titled "Issues in Neuroscience Education: Making Connections," SfN staff collaborated with William Cameron, co-chair of SfN's Public Education and Communication Committee, to write a feature article outlining the Society's strategy for engaging its members in education efforts. Nineteen SfN members contributed to the issue, writing seven research articles and a number of reviews. Kimberly D. Tanner, a member of SfN's Public Education and Communication Committee and of the CBE-LSE Editorial Board, served as the issue's editor. In her editorial introduction, Tanner writes: "The neuroscience community is exploring innovative strategies to teach neuroscience to students of all ages, to forge educational collaborations across institutional boundaries, and to translate new findings from neuroscience research into educational materials that engage students in learning neuroscience." Participation in this special issue is in keeping with the Society's newly adopted Strategic Plan, which emphasizes a commitment to integrating current, accurate neuroscience content into K-12 curriculum. Members are encouraged to read the issue free of charge by visiting www.lifescied.org. ■

NINDS Extends Support for Neurobiology of Disease Workshop.

The National Institute of Neurological Disorders and Stroke (NINDS) has awarded the Society a Research Education Grant to support the Neurobiology of Disease Teaching Workshop through 2010. NINDS has supported the workshop, which occurs prior to SfN's annual meeting, since its inception in 1980. This year's workshop, to be held in Atlanta on Oct. 13, is titled "Motor Neuron Disease: A Didactic Journey from Spinal Muscular Atrophy to Amyotrophic Lateral Sclerosis."

The target audience for the workshop includes students, postdoctoral students, and young investigators. The advisory committee responsible for planning the workshop utilizes a model that presents integrated sessions about the state of the field in a given area. Participants are exposed to patient presentations, coordinated presentations by leaders in the field, and stimulating discussions facilitated by additional researchers designed to explore future investigation. ■

House Committee Approves President's 2007 NIH Budget; No Date Set for Conference with the Senate Version

The House of Representatives Subcommittee on Labor-Health and Human Services-Education Appropriations on June 7 approved the President's $28.3 billion budget for the National Institutes of Health (NIH), essentially freezing the operating level at the 2006 level.

The Senate Appropriations Committee has not yet scheduled action on its version of the bill. As of now, the prospects do not appear good for any additional funds to become available for NIH in 2007. However, the Society for Neuroscience will work with others in the biomedical advocacy community to try and persuade the Senate to seek additional funding if possible, and we will urge our members to communicate the importance of this to their representatives in Congress, most likely in September or October.

These recent developments follow months of false starts and party infighting. House Republicans narrowly adopted their budget resolution in May. However, in order to secure the votes of moderate Republicans, the leadership promised that they would try to find an additional $3.1 billion for labor, health, and education programs. This is not a part of the budget approved by the House subcommittee on June 7.

The Senate, on the other hand, adopted its preliminary version of the FY2007 budget resolution – a guide for spending to be followed by other congressional committees but not final action on individual agencies such as NIH – with a provision for an additional $7.1 billion for health and education programs.

The next step is for the House and the Senate Budget Committees to conference the two bills and work out their differences—the major item being the additional $7.1 billion in the Senate bill. As of early June, the two bodies had not set a date for a conference. In fact, it is possible that such a conference may not occur.

Without a reconciliation of the two bills, the Appropriations Committees of the House and Senate will most likely use the President's budget as their guide in funding individual programs.

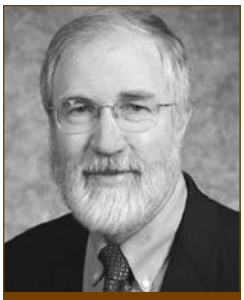
Taking into account that biomedical research inflation is at 3.7 percent in FY2006 and is projected to be 3.5 percent in FY2007, the President's budget represents deep cuts. Of the total requested, $1.9 billion is proposed for biodefense research, a net increase of $110 million, or 6.2 percent, over FY2006 funding. NIH proposes to create a $160 million fund within the Office of the Director to devote to the advanced development of biodefense measures that are priority Project BioShield acquisition targets.

The Society for Neuroscience will work with others in the biomedical advocacy community to try and persuade the Senate to seek additional funding if possible, and we will urge our members to communicate the importance of this to their representatives in Congress, most likely in September or October.

Also included in the request is $35 million to expand international and domestic pandemic flu research, $443 million to continue support for the NIH Roadmap, $15 million to foster support for new research investigators, and $361 million for a new clinical and translational science award program.

The proposed budget will support a total of 37,671 research project grants, or 656 fewer grants than currently estimated for 2006. NIH estimates that next year's budget will fund 9,337 new and competing grants, or 275 more than this year, at an average cost of $350,000 per grant. No increases will be provided for inflation. ■

An Interview with James Collins, Assistant Director of Biological Sciences at the National Science Foundation



James Collins

***NQ:* What is your vision for biological sciences at the National Science Foundation? What do you expect the BIO Directorate's key research priorities to be in the near future?**

Collins: Within any scientific discipline, the fastest way to advance understanding is to expand conceptual frameworks. Because biology is perhaps the fastest growing science of the late 20th and early 21st centuries, opportunities for development of new conceptual frameworks are nearly limitless.

The BIO Directorate is the center of biological research funding at NSF with a central focus on research that makes conceptual and theoretical advances, but many parts of the foundation are rapidly integrating the life sciences, including neuroscience. Biological research occurs across NSF directorates and programs: in biophysics, bioengineering, biomathematics, geobiochemistry, computational science applications to biology, and neurobiology in the social and behavioral sciences.

Increasingly, NSF will be seeking to support research that pushes the boundaries of the traditional areas of biology, efforts that will require forming collaborations both within NSF and with other partners. For example, support for neuroscience can be found in each of the NSF Directorates, at NIH, and at other agencies.

***NQ:* NSF is currently working on an updated Strategic Plan for the agency. How does neuroscience fit into the plan?**

Collins: The next NSF Strategic Plan will guide the foundation through fiscal year 2011 and is still being formulated. The plan will be integrated with the National Science Board report NSB 2020 Vision for the National Science Foundation (NSB-05-142).

NSF has a long and continuing commitment to supporting neuroscience as the key to understanding the biological bases of behavior. The agency is in a unique position to facilitate the development of conceptual frameworks in neuroscience, particularly in areas that have been traditional emphases of NSF's biology programs, such as the evolution of the cellular and molecular mechanisms that underlie the evolution of complex behaviors, and for understanding the basis for differences in behavior among individuals and within species.

NSF's commitment to neuroscience takes the form of support for initiatives and programs that span levels of analysis and complexity, and involves collaboration across disciplines, including computer and information science, engineering, physics, chemistry, mathematics, as well as the social and behavioral sciences. Indeed, it's the integration of innovative techniques used by multidisciplinary researchers that are at the heart of the most exciting neuroscience research supported by NSF. The advice of scientists in the community will be essential to NSF's current and future success in funding research in these areas.

***NQ:* How can the neuroscience community be helpful with the strategic planning process at NSF?**

Collins: A public comment period on the new NSF strategic report is planned for this summer. The information on how to make comments will be forwarded to the Society and we welcome inputs from its members. We hope that the SfN membership will assist all of us at NSF in developing plans for future neuroscience funding by identifying new and promising areas of research, many of which will be at the boundaries of disciplines.

***NQ:* Approximately how much is NSF spending annually on basic neuroscience research? Now that there are no "neuro" programs in BIO, how do you assess granting activity in the field of neuroscience? Are there plans to increase, decrease, or not change the level of spending in that area?**

Collins: In fiscal year 2005, NSF spent more than $82 million on basic neuroscience research, distributed across all directorates. BIO's investments were the largest, at just over $33 million, with the Social, Behavioral and

Economic Sciences (SBE) Directorate's second, at almost $24 million.

There are several review panels for basic neuroscience awards at NSF. For example, panels in BIO that met this spring to consider grant proposals related to neuroscience were in the fields of developmental neuroscience, integrative cellular neuroscience, behavioral neuroscience, neuroendocrinology, animal sensation and movement, animal behavior, and computational neuroscience. BIO's organization into clusters allows for more opportunities for neuroscientists because grant proposals that formerly could only be considered by one area now have a wider range of opportunities for review. Neuroscientists are also involved across the Foundation, including in our instrumentation, centers programs, and international activities. NSF's BIO and SBE Directorates will sponsor a workshop this summer — "Frontiers in Neuroscience: Understanding the Biological Bases of Behavior" — to bring together a group of social, behavioral, and cognitive neuroscientists to make recommendations about the best ways for NSF to encourage creative, dynamic, and innovative research that leads to an understanding of the biological bases of behavior.

***NQ:* In the past, research funding from NSF was generally limited to $100,000 per annum. With approximately 40 percent of the award going to the institution for indirect costs, the direct cost could cover the stipend for one postdoctoral fellow or one student, leaving little money to do the research. Will future funding be commensurate with research needs so that investigators can focus on the research, rather than scrambling to find extra funds to cover the shortfall in NSF funding?**

Collins: NSF continually works to find new ways of addressing this issue. The subject is one of general discussion at NSF, as it applies to all fields of science, engineering, and education that NSF funds. There is an inverse relationship between award size and funding rate, given the relatively stable overall agency budget and constant, or increasing, proposal pressure. NSF is working hard as an agency to find new ways of addressing this challenge. The Foundation would welcome ideas from the SfN membership on how best to address this issue.

***NQ:* Are there new or emerging funding opportunities related to neuroscience that might interest the neuroscience research community?**

Collins: This summer's NSF workshop will, it's hoped, lead to new opportunities in neuroscience funding. In addition, NSF is currently recruiting a number of neuroscience program directors. We hope that SfN members will consider serving the community by becoming rotating program directors at the agency. There is also an NSF working group on neuroscience initiatives, chaired by the BIO and SBE assistant directors, whose members would welcome SfN's input to decisions about future funding directions. The working group has members from across NSF's Directorates. Moreover, there are neuroscientists serving on several of our prestigious advisory committees, including BIO's, SBE's, and the newly formed Cyberinfrasturture Advisory Committee. This is an excellent avenue for community input into the decision making process.

***NQ:* The field of neuroethology, which emphasizes systems-level neuroscience under dynamic conditions in the context of animal behavior in biologically realistic circumstances, is an important and growing area of investigation. At NIH neuroethological projects often have fallen through the cracks, as they typically do not relate directly to disease. NSF has supported studies in this field in the past. Are there plans to continue or expand support for research in these directions? What about related areas such as comparative and evolutionary neurobiology, neurobiology of invertebrate and non-mammalian vertebrate models, etc.?**

Collins: NSF has a long history of investing in the field of neuroethology, and plans to continue to invest in this area. We are particularly excited about proposals that cross traditional boundaries. NSF encourages investigators to submit proposals that bring new techniques to bear on existing questions. Neuroethology fits this description well.

***NQ:* A related question is what might be the same or different about the kinds of neuroscience-related grants that are likely to be funded by NSF over the next several years?**

Collins: One of the greatest conceptual advances in modern biology is based on the finding that dramatic changes in structure and function can result from minor mutations in genes coding for regulatory factors. The

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Publishing Open Access Group Seeks Member Comments

SfN's Publishing Open Access Group (POAG), an eight-member working group appointed by Council to examine the issues of open access publishing, is exploring several initiatives intended to raise awareness among and seek input from SfN members and journal authors about the implications of open access and other publishing challenges, particularly as they may affect the Society, *The Journal*, and the world of science publishing over the next few years.

In January of this year, in keeping with current trends toward greater access to scientific publications, *The Journal of Neuroscience* moved to a six-month access control policy, as reported in the Winter 2006 issue of *Neuroscience Quarterly* (www.sfn.org/winter06nl). At that time, SfN President Stephen Heinemann encouraged members to become engaged in the discussion of the feasibility of open access models for scientific journal publishing.

With the support of Council, the POAG decided on an initial three-pronged approach:

1. Invited commentaries to be published in *The Journal* — Several leaders in the scientific and medical publishing community have been invited by *The Journal*'s editor-in-chief Gary Westbrook to contribute commentaries on the future of electronic journals. The commentaries will be published in *The Journal* in issues leading up to the October annual meeting. In the hope that the articles will provoke discussion, readers will be able to provide feedback via an online forum hosted by the Society.

2. Online survey that was conducted in mid-June — All SfN members and journal authors published in the past five years were invited to participate in a short online research survey. Participants were asked for their input on a number of questions related to planning the future of *The Journal*, including the advisability of continuing the print edition and the interest in adopting an open access business model. The goal is to understand better how SfN members and journal authors answered these questions, so that a course may be charted for *The Journal* that is in line with members' and authors' needs and preferences. The Society engaged Kaufman Wills publishing consultants to conduct the survey and to analyze the findings over the summer. The POAG will present the results to Council at the annual meeting, along with its recommendations for further action.

3. Roundtable discussion on publishing at Neuroscience 2006 in Atlanta —"(R)evolution in Scientific Publishing: How will it affect you?," a roundtable discussion sponsored by the POAG and moderated by SfN President-Elect David Van Essen, a past editor-in-chief of *The Journal of Neuroscience*, will be held 9:30 – 11:00 a.m. on Monday, Oct. 16. Panelists from the world of science publishing will discuss the current challenges facing the field, followed by an open discussion with questions and commentary from the audience. Members are encouraged to attend and discuss the future of open access with representatives of the publishing community and SfN leadership.

Members are encouraged to provide feedback on the POAG plan or scientific publishing in general by visiting the SfN Open Access Publishing Forum at www.sfn.org/forum. ■

Letters to the Editor

NQ welcomes reader responses to articles that appear in the newsletter. If you would like to respond to an article or idea appearing in NQ, please send an e-mail to nqletters@sfn.org. The editors of NQ reserve the right to select letters for publication and will edit them for style, length, and content.

— The Editors

NEUROSCIENCE 2006

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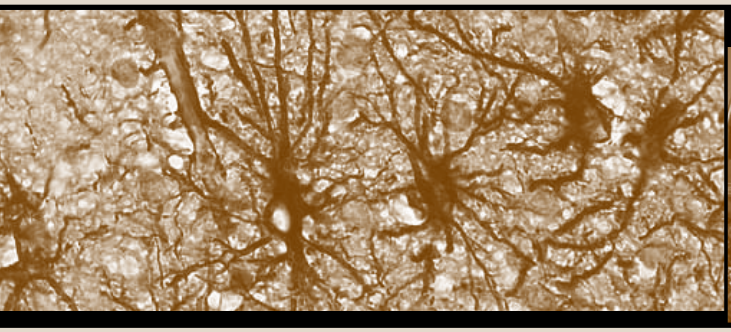
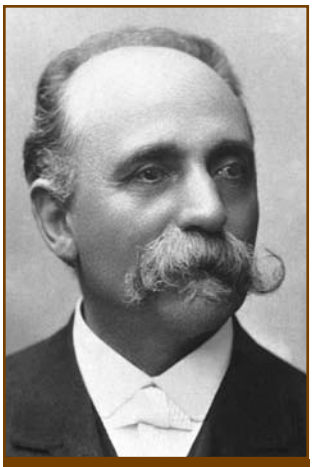


SEE YOU IN Atlanta!

SOCIETY FOR NEUROSCIENCE

Cajal Mural Dedication, continued from page 4



Camillo Golgi

Santiago Ramón y Cajal

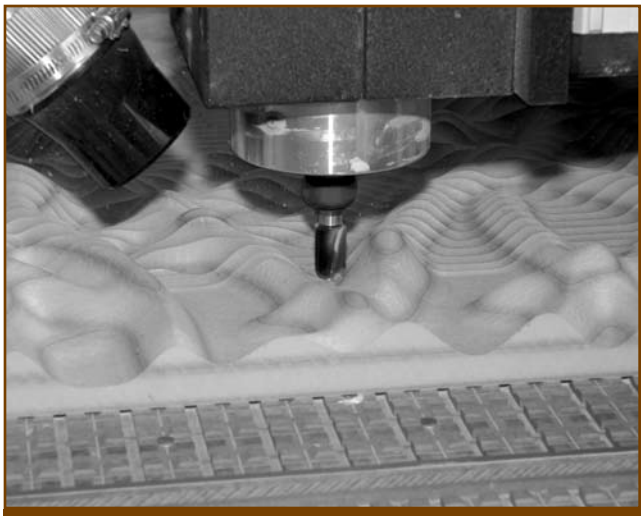
to Cuba. Upon his return to Spain in 1881, he became a professor in Valencia, and later in Barcelona and Madrid. He served as director of the Zaragoza Museum and the National Institute of Hygiene, and founded the Laboratorio de Investigaciones Biológicas, which was later renamed the Cajal Institute.

Among his many honors, Cajal was made an honorary Doctor of Medicine by the Universities of Cambridge and Würzburg, and an honorary Doctor of Philosophy by Clark University in Worcester, Mass. Over the course of his distinguished career, he published more than 100 books and scientific works in French, Spanish, and German.

Cajal's work provided the foundation of modern neuroanatomy and included detailed descriptions of nerve cell organization in the central nervous system, illustrated by his renowned drawings. He is often considered to be the "father of neuroscience," which was not recognized as a separate discipline until decades later. He died in Madrid in 1934.

In planning the headquarters space, SfN's Council wanted a large-scale image representative of neuroscience displayed in a prominent location. The architects at Envision Design conceived the idea of pulling the central staircase away from the wall to create a dramatic, continuous three-story space upon which artwork could be displayed. After Council approved the concept of deriving the image from a Cajal drawing, Envision proposed translating the sketch into a bas relief in wood, and engaged The Catholic University of America School of Architecture and Planning Design Collaborative (CUA*dc*) to act as the project's fabricator.

The CUA*dc* is a fully functional architecture design firm within the university's architecture school that serves community groups and nonprofits. It hires select architecture students to provide them with real-world experience and expose them to the realities of seeing a deadline-driven project through to completion. The Cajal Mural was one of the CUA*dc*'s two initial projects.



A wood router

Through an algorithm that assigned depth values based on shades of gray, 3-D modeling software converted Cajal's original black-and-white sketch into a computer model. This model was used to guide a computer numeric controlled milling machine, a wood router that moves on three axes. Each panel took approximately 15 hours to carve, and was then hand-sanded by students working for the CUA*dc* before being painted and installed. The mural consists of 16 four by six feet panels made of formaldehyde-free, medium-density fiberboard containing recycled wood product. Between each panel is a quarter-inch reveal, inviting the viewer's eye to fill in the missing space. Overall, the mural stands 12 feet by 32 feet. The architectural lighting grazes the neurons and cell bodies, creating a continuous pattern of light and shadow. ■

Neuroscience 2006 Preview, continued from page 5

disorders. The comprehensive meeting program continues to demonstrate how interdisciplinary the field of neuroscience is and how a commitment to combining multiple approaches leads to new discoveries and insights.

This year's Albert and Ellen Grass Lecture, "Genes, Behavior, and the Sense of Smell," will be given by Cornelia Bargman of the Howard Hughes Medical Institute, The Rockerfeller University. She will examine the question of how fixed genetic networks encode flexible behaviors.

Winfried Denk of the Max-Planck Institute for Medical Research will present the Fred Kavli Distinguished International Scientist Lecture. Denk will discuss how modern optical technology allows neuroscientists to look deeper, see more clearly, and watch for longer in carrying out research.

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The David Kopf Memorial Lecture on Neuroethics given by Judly Illes of Stanford University will explore the shift from top-down reactive ethics to action-driven ethics guided by working scientists. Illes will explore challenges in transferring neurotechnology to the clinic and commercializing it for the public and private sectors.

Albert Aguayo of McGill University will give the History of Neuroscience lecture on Santiago Ramón y Cajal's book *Degeneration and Regeneration of the Nervous System*. He will discuss how this seminal work continues to provide an accurate description of the neural reactions to injury, and how Cajal's insights anticipate many of the current ideas in the field.

As in the past, the Society will offer physicians the opportunity to earn Continuing Medical Education credits by attending a variety of sessions at Neuroscience 2006. Physicians will be offered the chance to earn a variety of Category I credits by attending poster and slide sessions, symposia, minisymposia, and lectures.

In addition to the lineup of lectures and symposia, Neuroscience 2006 will feature a number of workshops, meetings, and events. The Neurobiology of Disease Workshop will focus on motor neuron diseases (MNDs), a group of devastating paralytic disorders. Experts will present a comprehensive clinical review and evaluation of the mechanisms behind some of some of the most common MNDs.

A short course organized by Teresa Nicolson of Oregon Health & Science University will address how and why zebrafish are used to study neuroscience. György Buzsáki of Rutgers University will lead a second short course about how the brain orchestrates perceptions, thoughts and actions from the activity of its neurons

Many workshops are aimed toward the professional development of attendees, including those providing participants with instruction in a range of professional skills that are necessary for a successful career. Sessions will focus on finding and maintaining employment, managing conflict, and grant writing, among other topics. An interactive writing, editing, and publishing workshop will provide researchers with strategies for producing precise, clear texts.

New Meeting Planner Makes Navigation Easier

A wide range of resources before and during Neuroscience 2006 will help attendees easily navigate annual meeting events. Easy-to-read signs and thematically arranged events will guide you through the convention center quickly and efficiently.

The Neuroscience Meeting Planner (NMP) will help you plan each day at Neuroscience 2006 according to your interests, allowing you to print out your day's schedule or view on-site at the NMP Viewing Room. Users will be able to search the entire meeting's educational content, add presentations into an itinerary, and download the itinerary to a PDA device. Once attendees download the itinerary planner/abstract viewer to their personal computer, the software can periodically check the Web for changes and updates. ■

Message from the President, *continued from page 3*

new pathways to discovery, noting that future progress in medicine will require understanding of the networks of molecules that comprise our cells and tissues, their interactions and their regulation. For medicine to be revolutionized, it notes the need to know more precisely the combination of molecular events that lead to disease.

The Roadmap also describes how the scale and complexity of today's biomedical research problems increasingly demand that scientists move beyond the confines of their own discipline and explore new organizational models for team science.

The times demand that we as neuroscientists constantly advocate for the funding necessary to achieve the exciting breakthroughs envisioned by the Roadmap and the Blueprint, and enabled by the Human Genome Project. At a time when federal funding is not even keeping pace with biomedical inflation, purchasing power of research dollars is falling, and will in a few years be back to levels prior to the doubling of the NIH budget. Modest investment in research now has the potential to yield advances in treatment of disease and huge savings in cost of care later that will be many times greater than the investment.

RO1 grants, the backbone of basic discovery, are now harder to get and have taken large cuts so they do not cover inflation. In addition, new investigators, with their great potential for innovation, are having a very difficult time getting RO1s and to get their labs started.

Clearly, the Blueprint and Roadmap recognize the great value of developing and enhancing the linkages between the laboratory and the bedside as essential to the future of the neuroscience enterprise. The four lectures described above illustrate how this is now taking shape, and providing real hope for patients with some of the most devastating neurological conditions. I invite you to look at this emerging model for attacking diseases that cost the US economy more than $500 billion annually. And I encourage you to think about novel ways that you can participate in this exciting era for neuroscience. ■

Interview with James Collins, *continued from page 9*

structure and function of the nervous system are susceptible to these same considerations. Whereas 30 years ago it was difficult to conceive how structural genes could have evolved to underlie the vast expansion in size and complexity of the brain through vertebrate evolution, it now appears that comparatively small changes in regulatory genes can affect these parameters. Mutations whose outcome confers a selective advantage may persist in the species.

Comparative studies have revealed a remarkable conservation of these regulatory pathways among species, providing new insights into how organisms perceive, learn, remember, express emotions, and behave.

These processes must be studied in simple model organisms — where the neurons are few and pathways limited — as well as in complex organisms, including humans, where both the brain and activities are more highly evolved. Each of these areas is on target for NSF funding, and each involves biological, behavioral, and social aspects. NSF encourages proposals that will advance our understanding of these processes by advancing conceptual frameworks that apply to their study.

***NQ:* In the past, interdisciplinary research that doesn't fit squarely in one of the programs in BIO has been disadvantaged for funding. Is that problem being remedied, and if so, how?**

Collins: Consideration of this question was one of the major motivating factors for BIO's reorganization into clusters. By allowing more opportunities for proposals that cross traditional fields, the current organization dissolves many formerly narrower boundaries.

Through the upcoming summer workshop, NSF plans to develop funding mechanisms for studies that creatively integrate genetic, biochemical, developmental, physiological, imaging, and behavioral techniques with mathematical modeling to understand the behavioral repertoire and capabilities of a single organism. Research in this area is

at the heart of NSF's plans for neuroscience.

***NQ:* NSF has received strong support from President Bush, especially in his FY2007 budget. How would the proposed influx of additional funds be channeled to the biological sciences, and neuroscience, in particular?**

Collins: NSF is very excited by the strong support from the Administration for its FY2007 budget. It's very early in the budget process to know how Congress will appropriate funds. NSF has welcomed, and will continue to welcome, the input of the community to this process.

***NQ:* How does NSF see its role in the American Competitiveness Initiative (ACI), as outlined by the President in his budget and State of the Union message?**

Collins: NSF is extremely pleased to be one of three agencies singled out for increased funding to meet ACI research goals. As the report, American Competitiveness Initiative: Leading the World in Innovation, states: "Because the sciences — and especially their applications — are interconnected, research in physical science and engineering provides tools and technologies for all other fields."

The report continues, "basic techniques for imaging, manipulation and simulation of matter at the atomic scale are of value for applications in every field. To use the information in the human genome, for example, it is necessary to understand the functions of the proteins whose blueprints are encoded in DNA, a feat that is enabled by tools that visualize the immensely complex structure of these building blocks."

Those statements provide jumping off points for the NSF workshop on "Frontiers in Neuroscience." We hope SfN's members will assist us in discovering and defining those frontiers. ■

Opening Gala, continued from page 1

centennial of their achievement.

The festivities then moved two blocks away for dinner at the Madison Hotel, where SfN President-Elect David Van Essen toasted the Society and the field of neuroscience.

Teresa Ramón y Cajal Asensio, great granddaughter of Santiago Ramón y Cajal, spoke about her great grandfather's legacy, and thanked the Society on behalf of the other members of her family also in attendance. ■

NEUROSCIENCE QUARTERLY

Published quarterly by the Society for Neuroscience

Circulation: 39,000

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

20	trees
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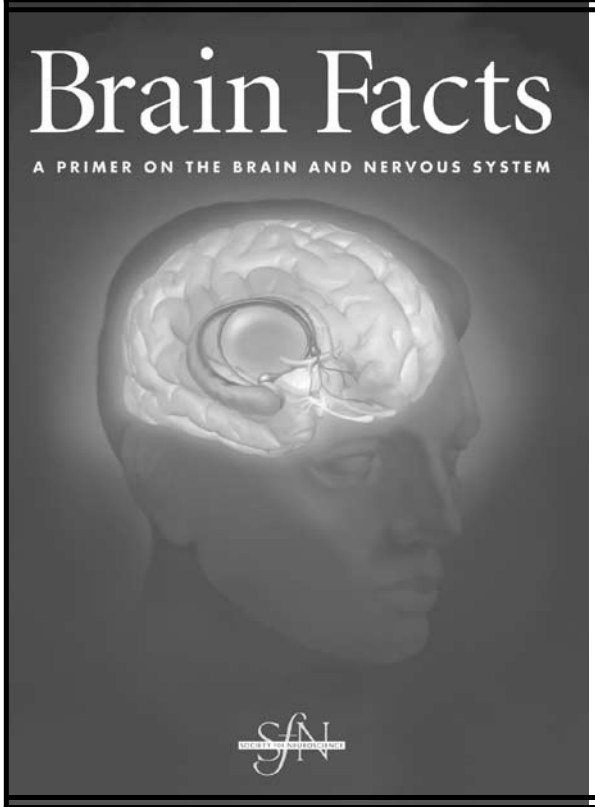

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