NEUROSCIENCE QUARTERLY

SUMMER 2003

". . . we all have our work cut out for us if we are to convince the public and policymakers to support the legislation that bans reproductive cloning but allows critical regenerative medicine research to go forward."

—Senator Orrin Hatch

IN THIS ISSUE

SOCIETY FOR NEUROSCIENCE

SfN Goes to Capitol Hill

On Capitol Hill this spring, the Society for Neuroscience presented awards to champions of biomedical research, testified before Congress in support of increased research funding and sponsored visits to legislators on important issues.

Sen. Orrin Hatch at the SfN Capitol Hill event.

The Society honored friends of neuroscience research on Capitol Hill on Wednesday, May 14, 2003. Reception attendees included SfN members, National Institutes of Health (NIH) leaders, members of Congress, congressional staff and journalists.

Senator Orrin Hatch (R-Utah) accepted the 2003 SfN Public Service Award from SfN President Huda Akil. Hatch received the award for his many efforts on behalf of research funding, support for somatic cell research (therapeutic cloning) and mental health parity legislation. His bold move to support therapeutic cloning distinguished him from fellow Republicans and was a turning point in the debate over such research.

In his remarks, Hatch noted that ". . . we all have our work cut out for us if we are to convince the public and policymakers to support the legislation that bans reproductive cloning but allows critical regenerative medicine research to go forward." Hatch added: "It is my hope and prayer that one day your members will develop treatments and cures for all the presently incurable neurological diseases so that no one has to suffer from diseases of the brain."

AWARDS TO FOX AND KENNEDY

Although he was unable to attend, SfN also presented a 2003 SfN Public Service Award to Michael J. Fox for his efforts to raise public awareness of Parkinson's disease and educating legislators about the need for continued federal research funding for Parkinson's and other neurological disorders. Michael Claeys, research programs manager at the Michael J. Fox Foundation for Parkinson's Research, accepted the award on Fox's behalf.

The other SfN public service award recipient was Senator Edward Kennedy (D-Mass.), who was also unable to attend. Kennedy was chosen to receive this award in recognition of his leadership of the Senate Committee on Health, Education, Labor and Pensions, as well as his support of biomedical research funding, mental health parity, therapeutic cloning and other efforts to improve the lives of Americans by increasing access to health care. The Society plans to present the award to Senator Kennedy in a face-to-face meeting this summer.
The reception provides an opportunity for SfN members to interact with members of Congress and staff, as well as leaders of the NIH research community. It is also an opportunity for the Society to recognize public figures who have helped to raise awareness of biomedical and neuroscience research issues.

CONGRESSIONAL TESTIMONY

On May 14, Akil asked the House Appropriations Subcommittee on Labor, Health and Human Services, and Education (L/HHS) for a 10 percent increase in funding for NIH, bringing the total for the agency to $30 billion in FY 2004.

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In her testimony, Akil noted that advances in drug therapy for the treatment of depression have resulted in much progress. However, she pointed out that there are still 5 million Americans who do not respond to the current drug therapies and are considered "untreatable." Akil held up two empty drug bottles, saying that continued research was necessary to fill these bottles and help cure the millions of Americans suffering from disorders such as depression. Rep. Ralph Regula (R-Ohio), the subcommittee chair and 2002 SfN Public Service awardee, asked questions about the classes of drug therapy currently available and the remaining obstacles to achieving better treatments.

If you wish to view the text of the testimony, please visit the SfN Web site at www.sfn.org/govnews.

PUBLIC ADVOCACY

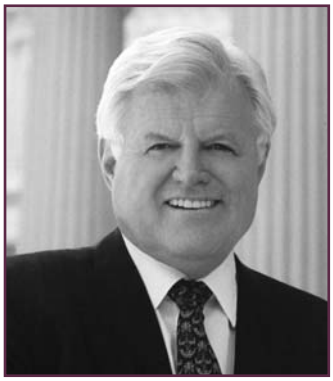
Also during the second week in May, small groups of neuroscience graduate students and postdocs were trained in public advocacy. Afterwards, they visited with their senators on Capitol Hill. Chapters participating in this initiative were from Portland, Oregon, and New Orleans. On May 13, Mark Rasenick, incoming vice-chair of the Governmental and Public Affairs Committee, trained the students on how to be effective in explaining their case to legislators. This included how to describe their research, important policy issues and what written materials they should bring to a meeting. Rasenick also accompanied the groups to meetings with their Senators. Each of the participants received copies of the SfN Guide to Public Advocacy, which is also posted on the SfN Web site at www.sfn.org/guide.

The graduate students also received fact sheets to use as "leave-behind" materials at the conclusion of their visits.

The participants learned that in meeting with a legislator or a staffer who specializes in health issues, these individuals want to know the purpose of the visit. Legislators also want to know

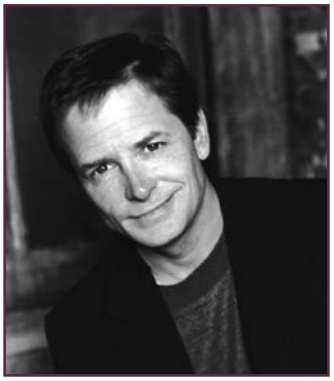
CAPITOL HILL RECEPTION

Sen. Orrin Hatch (R-Utah) accepts a SfN Public Service Award as SfN President Huda Akil looks on.



2003 SfN Public Service Award recipient, Sen. Edward Kennedy (D-Mass.).

Story Landis, Fred H. Gage and Sen. Frank Lautenberg (D-N.J.) discuss the future of neuroscience funding.



2003 SfN Public Service Award recipient, Michael J. Fox.

their constituents' needs, so requests should be outlined in advance. In ending the meeting, the participants left their contact information and other useful material about SfN and its legislative agenda.

Samantha Chirillo, Rebecca Hammond, Bobby Heagerty and Anthony Oliva from the SfN Portland, Oregon, chapter met with Senator Ron Wyden (D) and with Senator Gordon Smith's (R) health staffer. They discussed the importance of continued strong funding for NIH and other federal agencies. A 10 percent increase for NIH would bring total agency funding to $30 billion, allowing further progress on neurological disorders. They also touched upon topics such as mental health parity and discussed the importance of the responsible use of animal models in neuroscience research.

Reha Erzurumlu (SfN Chapters Committee Chair), Erick Green, William Guido and Lisa Jaubert-Miazza of the New Orleans chapter met with Senator Mary Landrieu (D), Senator John Breaux's (D) legislative counsel and Representative David Vitter's (R) communications director. They discussed the importance of continuing strong support for NIH's basic neuroscience research effort and how this funding provides the best solution for finding cures and treatments for neurological diseases. They also pointed out the economic impact that NIH funding has on a local community. For instance, a researcher receiving a grant can, in turn, employ several people to accomplish their research and provide jobs to the community.

CONGRESSIONAL LIAISON COMMITTEE

SfN members interested in participating in visits to Capitol Hill, similar to the ones above, can do so through the Society's participation in the Joint Steering Committee. The committee's Congressional Liaison Committee (CLC) arranges visits for groups of scientists to train them in public advocacy and then escorts them to visit their elected officials. SfN members can join CLC at www.jscpp.org/clc.html. ■

PUBLIC ADVOCACY

Bobby Heagerty listens to Rep. Blumenauer (D-Ore.).

Oregon graduate students and postdocs speak with Rep. Earl Blumenauer (D-Ore.).

CONGRESSIONAL TESTIMONY

Rep. Ralph Regula (R-Ohio), House Appropriations subcommittee chair.

SfN President Huda Akil testifies on increased biomedical research funding before the House Appropriations Subcommittee on Labor, Health and Human Services, and Education.

Message from the President

Scientific Strategy in Neuroscience: Discovery Science versus Hypothesis-Driven Research

As neuroscientists, we have been raised with the view that the best research is hypothesis-driven. During the peer review process, labeling a proposal as "descriptive" or a "fishing expedition" does not augur well for its funding. This belief, part of our scientific culture, is passed from one generation of scientists to the next and has become deeply ingrained. When training graduate students and fellows, evaluating dissertations and overseeing the writing of scientific papers, we strive to communicate the importance of enunciating a clear hypothesis, defining its scientific antecedents, describing the best path for testing it and reporting on the results in terms of the original hypothesis.

There is much to be said for this approach. It represents an intellectual discipline that is essential in a field as complex as neuroscience. It builds on prior knowledge, demands integrative thought and requires imagination for accurate prediction. A hypothesis can sharpen the parameters of a question, guide experimental design, define a required set of tools, inform data analysis and conceptually frame the interpretation of the results. It is an essential strategy for systematic thinking that should clearly be part of the conceptual repertoire of any scientist.

The question here is not whether hypothesis-driven research should be one way to conduct science, but whether it should be the only way.

If we were to be truthful, we would admit that often hypotheses are retrofitted to our accidental observations. Moreover, these un-hypothesized observations are, in many cases, more exciting and revealing than anything we would have ever posited. They spur us in directions that no pure thought process ever would. If we are very lucky, they lead us to revise many of the hypotheses previously conceived.

Neuroscience is a young field. During its early years, there was little basis for hypotheses except of the vaguest sort. What good would our hypotheses have been without some fundamental, descriptive information about the brain—ranging from its anatomical organization and connections to its electrical properties and the existence of particular chemicals and signaling mechanisms within it?

A question for my graduate school qualifying exams during the 1970's was: "Why does the brain need more than two neurotransmitters, an excitatory one and an inhibitory one?" I shudder to think what I must have made up in response. In the course of a few decades, we have moved from thinking that the brain uses a handful of neurotransmitters to realizing there are dozens and from conceiving of neural communication as a "go-no go" process to seeing the depth of the regulatory complexities involved.

Huda Akil,
SfN President

For many years we were, at best, vaguely aware of some fundamental features of brain function, not only regarding its complexity but also the numerous ways it changes its structure as a result of experience. This alone should make us wonder whether there might be much more that needs to be described, in ways that cannot be readily hypothesized. The fact that the brain expresses a large proportion of the genome within it, in a region- and cell-specific manner, is enough to give us pause. Do we really know enough to rely entirely on hypotheses that only derive from prior knowledge? Should we not use all possible tools to give the brain its due?

It should be noted that our fervor for hypothesis-driven research is not equally shared by all fields of biology. The field of genetics, for example, manages an interesting blend. It has demonstrated the power of random mutagenesis as a means of discovering the basis of various phenotypes. The search for the genetic basis of disease allows for both hypothesis-driven approaches and those that can be construed as systematic fishing. Clearly, they are based on prior knowledge, including an understanding of recombination rates, patterns of inheritance and the impressive technology of molecular genetics. Still, the discovery of the genes responsible for many disorders has been governed only by the broadest of hypotheses—that a gene lurks somewhere behind a Mendelian disorder. And the Human Genome Project can hardly be described as hypothesis-driven research. Still, few would deny its profound impact on all fields of biology.

THE ROLE OF DESCRIPTION

One might ask: If not hypothesis-driven, then what? To begin with, there is still much to be described in the nervous system. The power of functional neuroanatomy should not be underestimated. For a novel gene, a single brain section showing its pattern of gene expression can tell volumes: Is it expressed in neurons or glia? Is it in every cell or in a specific set of brain structures? Is it expressed in specific types of neurons? A single anatomical map, albeit descriptive, can offer the framework for an entire field. In the mid 1970's, the field of endogenous opioids was muddled, as numerous endogenous peptides were being biochemically extracted from various tissues. They bore remarkable structural similarities to each other, leading to speculation as to their origin. Were they derived from the biosynthetic maturation of a common precursor, the breakdown of larger molecules, or did they represent distinct classes of signaling molecules?

Immunohistochemical studies resolved the conflict and showed that none of the hypotheses were quite correct. Multiple neural and endocrine systems containing distinct opioid peptides were shown to exist in the brain and the pituitary and adrenal glands. This descriptive approach not only resolved many issues, it opened up untold research avenues and accurately anticipated the associations later revealed by cloning the relevant genes.

DISCOVERY SCIENCE

Beyond these classic approaches, the last few years have seen the advent of "discovery science," which includes all the "omics"—genomics, proteomics and cellomics. These are part of the post-genome era, and imply the use of high throughput technology to take advantage of newly acquired molecular genetic knowledge, examining thousands of genes or their products rather than focusing painstakingly on one molecule at a time.

For example, microarray technology can allow the investigator to obtain a snapshot of the expression of tens of thousands of genes that might be active in a given tissue or altered by a given manipulation. This technology is still in its infancy and faces numerous technical challenges. Its scale demands increasing sophistication in statistical approaches for data mining and in data handling and informatics. Nevertheless, it allows the study of brain function and dysfunction in ways that we could have hardly imagined a decade ago. We can study how a given experience changes the activity of an entire biochemical pathway, for example, a growth factor, its receptor(s), downstream intracellular signaling pathway and transcriptional targets. This ability to look at ensembles of genes has led some molecular and cell biologists to speak of the ability to conduct "systems research," wherein one studies an entire process rather than a single molecular event.

Neuroscientists have always appreciated the importance of systems research. We have long been aware that neural function requires the orchestration of numerous signals, across multiple cells and in well-defined circuits, but we have never had the tools to attack this level of complexity in a coordinated manner. There are still many technical challenges ahead, not only in terms of adapting and perfecting the "omics" for neuroscience, but also in terms of combining these techniques with other time-honored neuroscience approaches—anatomical, electrophysiological and behavioral. Nevertheless, it is safe to say that neuroscience, specifically because of the complexity of its subject matter, stands to gain the most from such "discovery" approaches.

A THOUGHTFUL BLEND

Discovery research generates torrential amounts of data. Thus, new strategies, including mathematical modeling, will be required to begin to integrate such information. Moreover, the step immediately following "discovery" is to evaluate its meaning, and that has to be done by generating testable hypotheses. I contend that our skills as hypothesis makers and testers will be challenged and improved because of discovery science. It is safe to predict that the hypotheses will be richer, more novel and less like variations on a theme. They will represent the style and scientific instincts of the individual scientist, and this increase in diversity and creativity will invigorate the field.

Our standards of originality will rise. A hypothesis should not simply be the next step, but an exciting potential next step, one that is based on a glimpse of a possibility, one that requires intellectual risk, but that can be backed by a wealth of available tools and strategies.

"I contend that our skills as hypothesis makers and testers will be challenged and improved because of discovery science."

—Huda Akil

IMPLICATIONS

If neuroscience accepted the notion that multiple scientific strategies are needed to understand neural function – including the use of description, of discovery science along with the elaboration of hypotheses – this would have important implications for many of our "socioscientific" activities.

For example, the peer review process would need to reassess its criteria for what constitutes a first-rate grant proposal. It will need to accept the fact that the applicant cannot predict the results of discovery research or predetermine how those resources will lead to the next step of investigation. The review, rather than evaluating the specific step-by-step plan, may need to evaluate other factors. Some possibilities include the thinking style of the investigator, the manner in which questions are framed, the ideas pursued and the evidence from past research accomplishments that data gathered will lead to creative ideas rather than a muddled mess (which is presumably what we fear from non-hypothesis research).

As importantly, we will need to alter the way we train young scientists. Beyond teaching them strategies for good description, beyond inculcating the importance of generating and testing hypotheses, how do we teach them to work with "discovery science"? In the end, this may be one of the greatest benefits of this broader approach. The only way we can teach our students to handle discovery science is to embrace the essence of discovery—a sense of personal adventure, excitement and curiosity—difficult to encapsulate in any specific guidelines, but reflecting the individual's intellectual bent and scientific taste.

We would need to teach our students to develop their own unique style and to trust their own sense of science. Nothing could be better for them or for neuroscience. ■

Better Navigation, Improved Services Mark Neuroscience 2003 in New Orleans

For 2003, the Society has instituted several changes to help make the annual meeting more navigable for attendees and provide better services for professional development.

The Program Committee has begun a process that seeks to strike a delicate balance between a program that focuses on individual subdisciplines within neuroscience and one that exposes neuroscientists to cross-disciplinary research beyond their own areas of expertise.

Each theme will consist of symposia, special lectures and slide and poster sessions. In the years to come, these events will be arranged to be in proximity to each other as convention space allows and will also be organized to minimize overlap within each theme and related themes.

The nine themes are development; synaptic transmission and excitability; sensory systems; motor systems; autonomic, neuroendocrine and other homeostatic systems; cognition and behavior; neurological and psychiatric conditions; techniques in neuroscience; and the history and teaching of neuroscience. Morning symposia and afternoon poster and slide sessions will alternate with morning poster and slide sessions and afternoon symposia for each theme. The program for each individual theme can easily be printed out from the electronic program. This new organization will not take away from the inherent interdisciplinary nature of neuroscience but allows members to better identify and navigate the sometimes overwhelming complexity of the annual meeting. This new structure should make the meeting a more pleasant and manageable experience.

CAREER DEVELOPMENT

Changes to the professional development program at Neuroscience 2003 include free registration in the FASEB job placement service for meeting attendees. SfN will sponsor sessions on writing, nonacademic careers in neuroscience, obtaining funding from foundations, professional skills, NIH and NSF funding for training and career development, mentoring and job hunting.

The FASEB job placement service offers an informal and confidential setting for job applicants and employers to meet, conduct interviews and post job openings. Interested applicants and employers can register online at https://ns2.faseb.org/career/crc/sfncrc.htm, or by mailing registration form and payment to: FASEB Career Resources, 9650 Rockville Pike, Bethesda, MD 20814-3998. The deadline for advance registration is Friday, October 31. On-site registration will also be available.

The service features computer-assisted registration and interview scheduling, self-service search-and-referral computer terminals, on-site interview facilities, a "position available" posting area, message center and employer photocopying services, career development seminars, cover letter and resume critiquing and a year-long listing in *CAREERS OnLine* database. Register in advance for Neuroscience 2003 and take advantage of CAREERS Online before the meeting. For the job placement service, register online at https://ns2.faseb.org/careerweb.

The FASEB career development seminars and workshops include exploring recruitment, employment, career strategies that work, business correspondence, writing an effective resume or curriculum vitae, ten critical ways to make a positive and lasting first impression with an employer, why references are important, the steps in the job search, alternative careers and how to start a new job.

Changes to the professional development program at Neuroscience 2003 include free registration in the FASEB job placement service for meeting attendees.

The SfN workshop designed to help members enhance their writing applies not only to *The Journal of Neuroscience*, but in all venues. The four-hour workshop covers basic scientific writing skills and manuscript preparation and editorial issues. It is co-led by Linda Cooper, associate director, Centre for the Study and Teaching of Writing, McGill University, and Gary Westbrook, Editor-in-Chief, *The Journal of Neuroscience*.

The session on nonacademic careers in neuroscience, organized by Judy Illes, PhD, Stanford Center for Biomedical Ethics, discusses nonacademic careers and the issues that accompany career paths outside academia. The panel, led by representatives from NIH, the science foundation world and science publishing, will emphasize the training and skills required to position both new and established neuroscientists for successful careers, the unique benefits and pressures of working outside the mainstream academic setting, issues surrounding transitions between the academic and the nonacademic job market and the challenges of mid-career re-entry and career change. For more information, please go to www.sfn.org/workshops.

CONTINUING MEDICAL EDUCATION

At Neuroscience 2003, medical doctor attendees can earn up to 41.75 hours of continuing medical education (CME) credit by registering for CME either during the annual meeting

registration process or on-site, providing an opportunity to earn almost half of required yearly CME hours. A nominal fee of $40 is charged to cover administrative expenses. CME credits can be earned by attending any of the following scientific sessions: poster and slide sessions, special lectures, symposia, presidential special lectures, the presidential symposium, the public lecture, the Grass Foundation lecture, the Pfizer lecture and the Dana Alliance neuroethics lecture.

This year, a special program supplement for CME registrants will be posted on the annual meeting Web site (www.sfn.org/am2003). The supplement will provide learning objectives for activities in each of SfN's nine scientific themes, acknowledgment of commercial support, credit designation statements and a definition of SfN's target audience.

The final program will indicate which individual activities offer CME credit. It will also include more specific credit designation statements for each type of CME activity. The History of Neuroscience lecture will no longer be eligible for CME credit. In its place, the more clinically relevant Dana Alliance neuroethics lecture has been added.

To expedite the processing of CME certificates, a new Web-based system will be available for use after Neuroscience 2003. CME registrants will be able to access an online system to record credit hours and print CME certificates. Instructions and details will be provided in the CME Supplement. For information, please go to: www.sfn.org/cme.

Poster session at Neuroscience 2002.

In addition, the electronic message center has been updated for Neuroscience 2003 to enable attendees to retrieve and send messages remotely. Details will be provided in the final program and will be posted on the SfN Web site. ■

Dates and Deadlines

ANNUAL MEETING REGISTRATION

Recommended advance registration receipt deadline for non-North American attendees to ensure timely receipt of name badge and program (if ordered) Aug.15
Receipt deadline for advance registration by mail, fax and phone . . . . . Sept. 5
Deadline for online advance registration . . . . . Oct. 1
On-site online annual meeting registration opens and continues through annual meeting . . . . . Oct. 8
Last day to apply for membership prior to annual meeting registration . . . . . Oct. 10
Last day to cancel annual meeting registration and receive refund . . . . . Oct. 24
On-site registration opens at the convention center . . Nov. 7

HOTEL

Advance registration requirement to make hotel reservations is lifted . . . . . Sept. 2
Last day for students to make hotel reservations from the special student block. . . . . Sept. 22
Last day to make hotel reservations. . . . . Oct. 1
Last day to cancel hotel reservations and receive deposit refund . . . . . Oct. 24

Registration Fees

	ADVANCE Opens at noon on July 21 for members and noon on July 28 for nonmembers. Advance online Closes October 1.	ON-SITE ONLINE Opens October 8.	ON-SITE Opens November 2.
Member	$205	$240	$250
Student Member	$65	$75	$80
Nonmember	$365	$400	$410
Student Nonmember	$80	$90	$100
Guest	$20	$25	$30
CME Accreditation	$40	$40	$40

Chapters Describe Activities, Needs

A survey conducted earlier this year finds that the Society's active chapters are very involved in bringing news of neuroscience research to their communities. The survey also found that many chapters are anxious to become more active and are seeking funding for their programs.

Authorized by the SfN Chapters Committee, the survey polled the regional groups about their activities, numbers, funding and ways they could be assisted in accomplishing their goals. A staff working group was formed to strengthen chapters —as outlined in the strategic plan—by increasing chapter recruitment, activities and coordination. Preliminary work includes an analysis of chapter surveys and annual reports.

Both the chapter surveys and reports showed that many of the chapters have been extremely active in bringing neuroscience to the community. The most successful and most participated in program for all of the chapters is Brain Awareness Week (BAW).

LOCAL CHAPTER ACTIVITIES

The Montreal chapter reports that they have achieved tremendous success with BAW within their local schools. The chapter accomplished their goal of reaching between 5,000 and 6,000 French and English elementary and high school students in the greater Montreal area and, for the first time, local boys and girls clubs.

The Central Illinois Chapter engages in BAW activities every year. The group's "Brain Awareness Day involved children, parents and grandparents who learned about neuroscience from students, postdocs and faculty," according to Gene Robinson, chapter president, and Donna Korol, BAW chair for 2003. This effort is becoming one of the premier local outreach activities for a campus science unit.

Other chapters, such as Iowa and Michigan, give a great twist to their BAW activities by conducting a "reverse science fair," in which local neuroscientists' exhibits were judged by schoolchildren. This event is a creative way of encouraging children to take an active interest in neuroscience at an early age.

In March 2003, graduate students and postdoctoral fellows from the University of California at Irvine conducted sessions on learning and memory. In April, the university's Reeve-Irvine Research Center held a "Kids Science Day," at which more than 40 children had the opportunity to look at human, rat and mouse spinal cords and conduct simple experiments.

The Rhode Island Chapter participates in the Swearer Center Providence Science Outreach, in which teams of Brown University students teach a year-long science course in local elementary schools. The chapter also helps in a pre-college enrichment program at the center that features a series of Saturday lectures and activities for high school juniors and seniors.

REACTIVATING CHAPTERS

The reports also show that many past chapters on hiatus are now reactivating. Representatives from these chapters have reported renewed enthusiasm within their local community. These chapters have been encouraged by the success of their initial meetings and the great ideas that have been put forth by their members to help increase activity.

The analysis of the survey and reports has helped the SfN staff decide which areas require the most attention. Many chapters expressed a need for help setting up a chapter Web site or newsletter. Consequently, the staff is creating general templates that will be available in a chapter resource kit at the annual meeting. Local Web sites and newsletters should help serve as a centralizing base for chapter communication and help members become more aware of upcoming events in their area.

The chapter resource kit will also feature instructions on how chapters can pursue media and public outreach. This was a popular request among those surveyed, because many chapters need help gaining community recognition. The Government and Public Affairs Department has highlighted ways that chapters can work with their local media and gain public support. The kit will also outline methods of congressional advocacy, such as obtaining a BAW proclamation. Pertinent information on congressional outreach can also be found online at www.sfn.org/legislative.

RECRUITMENT AND FUNDING

To address the chapters' concerns about recruitment and participation, a list of tips will also be made available in the kit. These tips have been created with the help of chapter representatives, who noted certain especially useful strategies. For example, the Philadelphia chapter representative reports that networking directly with individuals brings the most action. Tactics like calling on individuals to participate as judges at poster sessions or nominating them to serve as officers were very effective.

"Our goal is that chapters will use such tips as a guide to bring new life and energy to their membership," said Chapters Committee Chair Reha Erzurumlu, "because chapters are an integral part of the SfN strategic plan."

The biggest concern among chapters is the lack of financial resources. To assuage this burden, the SfN Council approved the Chapters Committee's request to provide additional funds for chapter activities. These grant funds, ranging from $500 to $2,000 in total costs, will be awarded to individual chapters on a competitive basis. These awards are designed to help new chapters succeed in their local missions, support chapter infrastructure, promote the goals of the SfN strategic plan and support novel initiatives by the chapters. The deadline for spring grant proposals is October 1, 2003.

"We hope this experimental program will allow chapters to come up with interesting ways to advance the SfN strategic plan," said Ray Dingledine, SfN Treasurer.

The group will also submit a proposal to Council for a Chapters Social Night at Neuroscience 2004. The group hopes that this social will help to foster new ideas for enabling chapter growth that will be beneficial both to the chapters and the neuroscience community as a whole. ■

Society Membership Growth Invigorated By New Measures

Membership at the Society for Neuroscience increased 9% from 2001 to 2002 and 4% from 2002 to July 2003, reversing a trend of little change in membership from 1998 to 2001. As of July 1, 2003, with membership reaching over 32,500, SfN is currently the world's largest organization of scientists dedicated to the study of the brain and nervous system. The trend torward increased membership is expected to continue as a result of several measures designed to attract new members.

By 1998, membership had reached 28,000, increasing by about a thousand a year. In the four years that followed, however, the number of members who decided to discontinue their membership offset many of the approximately 3,000 new members recruited each year. SfN leaders wondered whether this lull in membership growth was simply a reflection of decreasing growth in the field of neuroscience research. But recent estimates of the rate of neuroscience growth indicate that the field is expanding more broadly than this leveling-off period suggests.

In April 2001, an e-mail survey was disseminated to nonrenewing members to gather feedback on why members had chosen not to renew membership. Respondents gave the following reasons for discontinuing membership: retirement, 9 percent; change of field of study, 29 percent; finances, 44 percent; health reasons, 7 percent; lack of interest in *The Journal*, 2 percent; dissatisfaction with meetings, 4 percent; dissatisfaction with foreign payment options, 2 percent; no reason specified, 2 percent. Despite a limited response rate, the survey pinpointed some essential concerns of SfN members.

NEW INITIATIVES

In November 2001, the Council charged the Membership Committee with evaluating both the incentives and disincentives of membership. In order to obtain a broader range of new ideas, the Membership Committee expanded to include a graduate student, an international member and a member from a pharmaceutical company. The Committee recommended the creation of a rolling application deadline that allows applicants to join SfN throughout the year. The rolling application procedure became effective February 15, 2002, eliminating the spring and fall deadlines for membership. Under the rolling application deadline, SfN received 4,328 applications last year. Total SfN membership reached a record 31,206 members in 2002. In 2003, the Membership Committee continued to develop new membership initiatives including implementation of an online application form prior to the deadline for submitting abstracts, allowing more applicants to become members in time to submit abstracts; advance registration privileges for Neuroscience 2003, allowing members to register for the meeting and secure hotel reservations a full week in advance of nonmembers; weekly publication of *The Journal of Neuroscience;* and a renewed emphasis on professional development for members (see Neuroscience 2003, page 6). In addition, the Membership Committee requested that annual meeting registration fees be frozen in 2003, allowing members to receive a more significant discount than nonmembers, compared to the differential between member and nonmember registration in 2002.

STRATEGIC PLAN AND NEW BYLAWS

SfN's strategic plan, member survey and new initiatives have addressed members' concerns and have created a renewed sense of member involvement. As of July 2003, over 3,600 scientists, doctoral, graduate and undergraduate students and affiliates have applied for SfN membership. Of these new applicants, 51 percent (1,836) were student members, reflecting the continued student interest in neuroscience and the commitment of our members to education.

The bylaws referendum of 2003 enacted two significant changes in membership policy. Addressing concerns of unequal benefits offered to foreign members, the new changes in the bylaws eliminate the categories of foreign and foreign student membership, granting all regular international members the same voting privileges as their North American counterparts. The recent bylaws revision also allows students at the undergraduate and graduate level to apply for student membership. In prior years, only doctoral students were eligible for student membership. To date, over 200 undergraduate and graduate students (11 percent of all student applications) have obtained SfN student membership.

SfN welcomes all new members. Their contributions will add momentum to the Society's mission of bringing together scientists of various backgrounds to encourage research. ■

NIH Directors Battey and Sieving Discuss Opportunities for Vision and Hearing Research

A roundtable with James Battey, Director of the National Institute on Deafness and Other Communication Disorders (NIDCD) and Paul Sieving, Director of the National Eye Institute (NEI)

James Battey, NIDCD

NQ: What new initiatives are planned for hearing and vision research funded by your institutes?

Battey: We know that diagnosing hearing impairment within the first six months of life has significant ramifications for long-term development of language skills. We feel it is important to take advantage of the fact that most states are putting in place programs for hearing screening in newborns that take place before babies are discharged from the hospital. We are looking into research to identify and validate the best treatment strategies for very young infants.

Another area of interest is hereditary hearing impairment. Roughly one child in 1000 is born with hearing impairment, and in half the cases, the basis for it is genetic. There are hundreds of genes that underlie syndromic or nonsyndromic hereditary hearing impairment, creating a wonderful opportunity for gene discovery. These genes are teaching us about pathways and cell types within the inner ear that are crucial to normal auditory function.

> *"There are hundreds of genes that underlie ... hereditary hearing impairment, creating a wonderful opportunity for gene discovery."*
>
> —James Battey

Another interesting question is whether genetic testing would add value to the clinical assessment of infants with hereditary hearing impairment. If you can show within the first few weeks of life that there are mutations in a specific gene, for example, then there is no need to do a viral scan to rule out other disorders that may lead to hearing impairment. Genetic testing could simplify the clinical evaluation of a child.

Because we are now able to screen children at birth for hearing impairment, we recognize that there is a cohort of children whose hearing is relatively normal at birth, but who lose their hearing within the first several years of life. Epidemiological evidence points to congenital cytomegalovirus (CMV) infection as the basis for the hearing loss. However, only a small percentage of congenital CMV infections have clinical manifestations. In fact, only about 10 percent of those with clinical manifestations involve hearing impairment. It would be useful to understand which children with congenital CMV infection will develop hearing impairment because drugs to treat CMV infection are not benign.

Paul Sieving, NEI

Sieving: The new initiatives of the National Eye Institute are targeted toward increased research in neurodegeneration, genetic forms of vision impairment and animal models for vision loss.

One of the big agendas for the institute is to address the neural aspects of vision. We currently have only a very limited capacity to treat blindness from neurodegeneration. As with deafness, there are a large number of genetic forms of vision loss. Investigating the genetic basis for loss of sight will be fundamental to progress. Some initiatives are directed toward genetic studies using the zebrafish, in which—owing to its translucence—one can literally watch the development of the structures of the nervous system, including the eye and visual system. Research with animal models is central to systems neuroscience in its own right, and these models provide a bridge to developing human therapies. In some cases, animals have vision problems identical to humans, down to the level of the gene and even the specific mutation. Such cases provide unique opportunities for pre-clinical development of therapies in rodents and in larger animal models. One exciting project is directed at treatment for children born blind with a form of Leber congenital amaurosis that results from a local ocular deficiency of the 11-cis-retinal form of Vitamin A, due to a defective RPE65 enzyme. Gene therapy has already successfully reversed this condition and restored sight in a dog model that harbors the same RPE65 mutation as is found in these Leber children. Additional funding opportunities exist for neuroscience in retinal ganglion cell development, mapping retinal and cortical neuronal circuits and in oculomotor control disorders.

NQ: What do you think will have the greatest impact for the public and for neuroscientists?

Battey: I think the early identification of and intervention for children with hearing impairment will have a huge impact. And our cochlear implant research program has already had a big impact.

Sieving: Further work on the neurodegenerative vision diseases of age-related macular degeneration (AMD) and glaucoma will have a great impact on public health. One in seven elderly Americans over the age of 70 has AMD, which limits driving and reading vision. Visual neuroscientists and clinicians are also working on a condition called amblyopia that affects sight in young children as a result of a developmental abnormality of visual processing. The National Eye Institute is also quite interested in the predisposition toward disease that may come about as a result of differences in lifestyle or ethnic background. For example, fair-skinned races are more likely to develop AMD than are darker-skinned people, which may have both environmental and genetic roots. We need to understand the genetic factors involved in such health disparities, to help the public and to gain biological insights for understanding and treating these diseases.

For neuroscientists, work that will have great impact concerns how visual neurons develop, how they connect and integrate into circuits, how they survive and thrive and why they degenerate. The neurosensory visual system is a marvelous system to study, because one can stimulate and probe vision precisely, to learn how that stimulation affects central processing of visual information and, for example, feedback mechanisms into oculomotor control.

NQ: What are the keys to uncovering the underlying causes of vision and hearing disorders?

Battey: As far as we know, there are four major causes of hearing impairment: heredity, infection, toxic drugs like cisplatin or antibiotics and environmental insults, especially noise. We need to understand whether all of these damage the ear in the same way or if they have different underlying pathways.

Sieving: For each of the major diseases of the eye—childhood amblyopia, AMD, and the many forms of retinal neurodegeneration, including glaucoma—we need to know the genetic basis and neural mechanisms for the disease. The National Eye Institute is making major new investments toward these goals and we need the help of the neuroscience community.

NQ: Where do you see the most progress being made in the near future? In which hearing and vision disorders are scientists closest to developing effective treatments, and what makes this possible?

Battey: We are far from developing effective treatments, if effective treatment means restoring the hair cells that were damaged or lost in the inner ear. However, an NIDCD-funded study at the University of Michigan showed that, by placing a gene called Math1 into an adenovirus vector, hair cells would regrow in an animal model. It is important to restore the hair cells and get them rewired correctly in the central nervous system so that auditory perception is restored. Cochlear implants, though useful, bypass damaged hair cells (about 15,000 of them) and try to approximate their function with 8 to 22 electrodes. Clearly, in terms of the resolution of sound, a lot is lost to the ear stimulated with a cochlear implant. In fact, it is remarkable that the capacity for understanding spoken language is restored with this small number of electrodes and limited spectral resolution of sound.

Sieving: Progress is incremental, but there is tremendous vigor in elucidating pathophysiological mechanisms in several Mendelian monogenic forms of retinal neurodegeneration. Pharmacological protection and even cellular replacement appear possible in the years immediately ahead.

NQ: Which disorders will be more difficult to overcome and why?

Battey: Balance disorders are a challenge because unlike hearing, where all of the sensory input comes from the inner ear, the input comes from the visual system, the vestibular organ in the inner ear, proprioception in the joints and the sense of gravity perceived by the bottom of the feet. Balance disorders are important because they often cause falls in the elderly.

Ultimately, however, the most complicated task our brain does is create and comprehend language. Understanding this process will be a challenge for NIDCD for many years.

Sieving: The neural atrophic form of AMD will be a difficult but important condition to treat. AMD has a complex genetic and environmental basis. In some families, single genes cause distinct types of degeneration—such as juvenile macular degeneration or familial glaucoma—but more commonly, multiple genes act in synergy to undermine the survival of the retinal ganglion cells in glaucoma or photoreceptors in macular and retinal degeneration.

> *"For neuroscientists, work that will have great impact concerns how visual neurons develop, how they connect and integrate into circuits, how they survive and thrive, and why they degenerate."*
>
> —Paul Sieving

NQ: What effect will deciphering the human genome have on understanding the hearing and vision process and developing better treatments for hearing and vision disorders?

Battey: Work on the human genome has already accelerated our ability to map and positionally clone genes whose mutations result in hereditary hearing impairment. I think it will also open the door to understanding more genetically complex communication disorders such as specific hearing impairment or autism, where it is clear there is a very strong genetic component.

Sieving: The genetic basis for disease provides tremendous clues for understanding why and how a disease starts and progresses and what may be required to intervene. Having the human genome available will allow us to really begin to understand diseases of the eye.

NQ: How important are factors such as early experience, maternal care and genetics on the development of hearing and vision disorders?

Battey: We know there are windows of opportunity in early childhood during which, absent the proper auditory input, a delay in language and verbal communication skills is created. Such delays are difficult to overcome, so these factors are crucial.

Sieving: Genetics exerts a powerful role in vision diseases. For example, amblyopia can run in families, so we know there can be a genetic basis. Maternal care probably doesn't influence amblyopia as directly, except that if this condition is not treated while the child is young, it becomes refractory by late grade-school age. So health education and family involvement in the health and development of the child are important to vision. The Society for Neuroscience can help convey these important health messages to the public.

NQ: What technologies hold the most hope for overcoming hearing and vision disorders?

Battey: I think some of the advances in hearing aid technology will be very important. We need to work on developing more

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Journal Moves to Weekly Publication and Web-based Submission; Reaches Libraries in Africa

The Journal of Neuroscience switched from semimonthly to weekly publication in July and moved to a Web-based manuscript submission and handling system in May. Together, these changes will give manuscripts greater visibility and shorten the time from submission to publication. All new manuscripts must now be submitted using the online system. The URL is: http://sfn. manuscriptcentral.com/; a backup URL is: http://mc.manuscriptcentral.com/jneurosci/. The editors are aware that some glitches might occur during the initial transition. "We are dedicated to providing assistance to authors and reviewers as you navigate through this new system. We expect and hope for your patience and constructive feedback," say Editor-in-Chief Gary Westbrook and Senior Editor Stephen Lisberger. ScholarOne developed this new system, which is specifically based on the way manuscripts are handled by *The Journal of Neuroscience*.

Assistance with submissions is available beyond the online help available at *The Journal* site. For trouble accessing the system, if particular functions don't work or if there is difficulty with uploading images, contact the ScholarOne helpline at (434) 817-2040, x167. From outside North America, use: 011-434-817-2040, x167, or e-mail support@scholarone.com. For general questions about author instructions or format for electronic submission, contact the Central Journal Office, jn@sfn.org.

Older browsers (e.g., Netscape 4.X) will not work with this new system. Browsers such as Explorer 5.X, Explorer 6.X or Netscape 7.X are necessary. A PDF document that provides some tips for entering new submissions in the system can be downloaded at www.jneurosci.org/icons/ftp/jntips.pdf.

The journal's weekly publication will offer shorter tables of contents, giving each article greater visibility. *The Journal* will publish every week except the last two weeks of December.

JN IN AFRICA

Responding to a request from the libraries project of the International Brain Research Organization (IBRO), the Society now provides free electronic subscriptions of *The Journal of Neuroscience* to university libraries in Kenya, Morocco, Senegal, South Africa and Tunisia. Libraries in these countries were approved by the SfN Council and targeted for support because of their potential for development. An individual at each university has been charged with assuring appropriate use of the journals, with the selected libraries functioning as hubs for disseminating articles of interest to neuroscientists in the region and promoting the organization of journal clubs for students.

The IBRO libraries project supports the development of neuroscience resources in libraries from regions of the world where journals, books and other materials important for learning are needed but cannot be purchased. IBRO has delegated a committee on libraries, chaired by Roger Butterworth, from the University of Montreal, Hopital St-Luc, to help obtain free or low-priced subscriptions to neuroscience journals and other scientific publications. This committee has chosen to focus on Africa initially but eventually will extend its scope to other regions with similar needs. For more information, see www.ibro.org/secretary/about2/neuroscience.htm.

EUROPEAN JOURNAL OF NEUROSCIENCE

SfN members can now access the *European Journal of Neuroscience* free of charge through May 2004. Earlier this year, the SfN Council and Publications Committee agreed to accept an offer from the Federation of European Neuroscience Societies for free online access to the *European Journal of Neuroscience* for the entire SfN membership for one year.

SfN members have access to abstracts, full text, PDF files and Online Early of all current and archived *European Journal of Neuroscience* articles by using their SfN login and password at the "members only" section of the SfN Web site at www.sfn.org/ejn. ■

New Crisis Management Guidelines Will Help Members Deal with Animal Rights Activists

Leaders of the biomedical research community are urging scientists to take an aggressive approach in response to the tactics of animal rights activists.

"What you are going to see in the next couple of years is that the Society for Neuroscience is going to take a much more proactive approach toward educating its membership and educating the general public on the ethical use of animals and the absolute need and necessity for animal research in neuroscience," says David Amaral, who chairs SfN's Committee on Animals in Research (CAR). "Neuroscientists can no longer be simply reactive in their dealings with animal rights groups who vehemently oppose the use of animals in medical research."

Neuroscience researchers rely on the responsible use of animal models and have been the targets of activists. Yet, when neuroscientists using animal models come under fire, they often do not know what steps to take within their institutions and their communities to stabilize the situation. Piecing solutions together at the last minute can leave them vulnerable to further attacks.

CAR plans to provide effective preemptive crisis management guidelines to SfN members, outlining steps they can take to prevent disjointed and unorganized reactive tactics that are often employed too late to be effective.

Similar SfN guidelines for members were last produced in 1990, in a publication known as the *Handbook for the Use of Animals and Humans in Neuroscience Research*. This title was something of a misnomer because it actually discussed preemptive crisis management.

NEW HANDBOOK

Because researchers have gained much experience in this area during the last 13 years, both the title and the content of this handbook will be updated. CAR is working to make the guidelines as current and useful as possible. New guidelines will be posted on the SfN Web site by late summer or early fall.

Important preemptive tips include preparing an "animal use project file," which consists of a written lay summary of the research using animals and documentation supporting the approval of the use of animal models. The appendix will include a sample animal use project file for SfN members to use as a guide.

The guidelines warn neuroscientists to use careful wording in all research documents, because individuals who are nonscientists may read a researcher's manuscripts and grants and inaccurately interpret them. These documents may also be requested through the Freedom of Information Act, which is usually a sign that animal activists have taken an interest in a research project as a target.

The guidelines also cite steps to take within an institution if research is questioned. These steps include contacting the Institutional Animal Care and Use Committee representative, an institution's press office and the funding source. In addition to providing tips, the guidelines also mention useful documents to consult and national and local groups to contact for information and assistance.

USEFUL RESOURCES

One particularly useful national group, of which SfN is a member, is the National Association for Biomedical Research (NABR). NABR is the only national, nonprofit organization dedicated solely to advocating sound public policy that recognizes the vital role of humane animal use in biomedical research, higher education and product safety testing.

Founded in 1979, NABR provides the unified voice for the scientific community on legislative and regulatory matters affecting laboratory animal research. NABR's membership comprises over 300 public and private universities, medical and veterinary schools, teaching hospitals, voluntary health agencies, professional societies, pharmaceutical companies and other animal research-related firms.

NABR supports the responsible use and humane care and treatment of laboratory animals in research, education and product safety testing. Further, the membership believes that researchers should use only as many animals as necessary, that any pain or distress animals may experience should be minimized, and that alternatives to the use of live animals should be employed wherever feasible. To learn more about NABR or to become a NABR member, please visit their Web site at www.nabr.org.

SfN's CAR is interested in producing the most complete, up-to-date guidelines so that members can review their situation and take the proper precautions to avoid a potentially devastating incident.

CAR believes that the new guidelines will serve to empower the neuroscience research community, enabling researchers to act effectively and efficiently if they become the target of attacks by animal activist groups. When the guidelines update is complete, the SfN central office will notify the membership. ■

IBRO's Secretary General-Elect Discusses Future

Jennifer Lund

Jennifer Lund is the incoming Secretary General of the International Brain Research Organization. She served as the Society for Neuroscience's treasurer from 1991 to 1992. Her three-year term of office at IBRO commences on January 1, 2004. Lund is currently a faculty member at the John A. Moran Eye Center of the University of Utah in Salt Lake City.

NQ: How would you characterize IBRO right now?

Lund: It's in an excellent state. We have six regional committees around the world, all of which are very active. The two previous secretary generals have been extremely energetic about putting in place all sorts of new ventures. It's a flourishing enterprise with many different avenues.

NQ: Will IBRO maintain its current meeting frequency?

Lund: We are debating if the IBRO Congresses should in the future emphasize interactions within a region rather than being simply a global forum for international neuroscience research. We have very much supported and enjoyed the IBRO Congresses. An extra benefit might be gained by making a special effort to encourage the scientists of countries within particular world regions to attend and build stronger interactions through meeting and presenting their work at future IBRO Congresses.

NQ: Would you explain the libraries project and the school program?

Lund: The libraries project is a collaborative effort between IBRO and other organizations (WHO-HINARI project, SfN, AANTP and science publishers including Elsevier, the publisher of our journal *Neuroscience)*. The project helps the libraries of less advantaged countries around the world, as well as our IBRO schools, to obtain journals and books. The program provides free electronic journal subscriptions and book donations to selected institutions that otherwise would be unable to afford them.

We currently have 10 IBRO-sponsored neuroscience schools around the world, in Africa, South America, Europe and Asia, some in collaboration with the Federation of European Neuroscience Societies (FENS) and SfN. The North American Regional Committee and SfN have a very strong program with the Woods Hole Marine Biological Laboratory neuroscience course where IBRO provides stipends for gifted students from around the world to attend. The schools program is expanding all the time, and plans are being made to initiate a full neuroscience PhD program in collaboration with FENS.

NQ: Do you foresee any changes or additions to IBRO's worldwide programs?

Lund: I would like IBRO to build, more directly, clinical and basic science offerings. That could include conferences, additions to other society's meetings addressing particular disease entities, and additions stressing the relevance of neuroscience research to the clinical practice in the schools program. We have a visiting lecture team that goes around the world and I have felt that the team could be used to take some of the latest information about all sorts of neural diseases to a variety of regions of the world.

We would like to see trainees stay in, or return to, their home countries. If we could strengthen this policy, it would be really great, but it often means working with their government science policymakers to make sure conditions are appropriate for them to be able to return home. Links between more wealthy countries and poorer countries are worth building, so that if neuroscientists cannot work well in their home countries, they can at least teach in their home country while spending part of each year abroad to work in an established research laboratory.

NQ: What programs does IBRO have to support the professional development of neuroscientists?

Lund: If individuals want to run a workshop or a symposium on some particular aspect of neuroscience, they can apply to us for help with the funding. We're funding about 30 meetings a year. Meetings should have an international component and should have student attendees. Another aspect of these meetings is that they create networks between scientists. We also fund visits to labs and meetings to assist individual scientists.

NQ: How can IBRO encourage getting information on new advances and treatments to all regions of the world?

Lund: Our lecture team program should be very successful at this. We can bring together clinical and basic science experts and have them travel to countries, and present their ideas and thoughts for the future. It will take coordination to make sure each region's principal clinicians and younger trainees can attend, and potentially piggyback on regional or national neuroscience society meetings.

NQ: How can IBRO and the Society for Neuroscience work together?

Lund: We have a joint committee for North America, made up of members of the Society for Neuroscience and the National Academy of Sciences. Because North America is probably the premier region for neurosciences, it can do so much for the rest of the world. A lot of the committee's ventures are targeted outside North America, and this joint venture will be key to putting together lecture teams and conferences in training and the clinical and basic science offerings. There are lots of ideas coming out of the Society for Neuroscience, particularly in the area of training internationally, so I see it as a very powerful committee, and one that's going to be very useful.

NQ: How can individuals participate in IBRO programs?

Lund: Anybody who has an interest in any of our programs can go to our Web site (www.ibro.org). The contact information for each committee is given, and anybody interested in joining only needs to contact the chair. This organization is entirely volunteer; anybody who offers help will be welcomed with open arms. ■

... Vision and Hearing, continued from page 11

user-friendly and appealing hearing aids. We need to continue our work to develop a better cochlear implant with improved speech processing algorithms, and to understand why many people benefit greatly from it while a subset of people do not benefit at all. We are learning a lot from our studies of genes and hearing impairment. From this knowledge, we hope to tailor intervention strategies that are more precise and effective.

Sieving: Work on visual prostheses is proceeding, both at the retinal level and in the visual cortex, and one hopes for success, much as the cochlear implant is a neuroprosthesis for the ear. We would like to develop implantable electrodes to stimulate the residual nerve cells in the human retina and restore even rudimentary visual function to individuals with neurodegenerative blindness. Development of visual prostheses is an area that offers rich research opportunities for neuroscientists.

NQ: How can your institutes or the Society for Neuroscience attract a greater number of presentations on hearing and vision research at the Society's annual meeting?

Battey: There is very little auditory research at the Society for Neuroscience meeting. This may stem from the fact that the Association for Research in Otolaryngology, which is much more heavily attended by people in the auditory field, meets in the winter. However, auditory research would benefit greatly from having a greater presence in mainstream neuroscience. As we begin to get into complex cognitive functions like language, a stronger presence in mainstream neuroscience will be essential to advancing our mission. Perhaps a symposium that highlights research by four or five leading researchers in the auditory field would be helpful.

Sieving: The NEI and visual neuroscientists are ready to sponsor symposia at the Society for Neuroscience annual meeting. The Association for Research in Vision and Ophthalmology (ARVO) is a large specialty society that offers an increasingly strong annual meeting in the areas of visual neuroscience, immunology, genetics, prostheses and central nervous system processing in the visual system. But I advocate to all of our NEI grantees the benefit of cross-attendance by neuroscientists and vision scientists at their respective meetings, including ARVO, the Vision Science Society and SfN.

As vision researchers, we also need to demystify our disease lexicon for nonvisual neuroscientists. Terms such as glaucoma, amblyopia, macular degeneration, and optic neuropathy are familiar to vision scientists and are familiar as diseases that cause human suffering, but each is also a disease of neurodegeneration. I hope that more neuroscientists will see the considerable opportunities these conditions provide for understanding basic neurophysiology, neurodegeneration and neurogenetics.

NQ: How do you propose that your institutes partner with organizations like the Society to urge continued funding for neuroscience research and other science advocacy efforts.

Battey: We need to keep the neuroscience community aware of the public health problems posed by communication disorders and what progress is being made in treating them. We need to keep you fully informed about what the challenges are so that when you talk to people who are responsible for developing policy or determining funding for various areas of neuroscience, they are aware that there is a robust research community able to tackle these challenges and that with more funding, more research could be done on communication and balance disorders.

Sieving: Many of the vision diseases most urgently in need of attention have a basis in neuroscience. I would suggest that the Society for Neuroscience consider adding age-related macular degeneration to the familiar triad of Parkinson's, Alzheimer's and amyotrophic lateral sclerosis when it goes before Congress and others to advocate for research funding. The public will benefit, because national attention will be given to these dreaded diseases of aging, and science will benefit because these diseases share corollary mechanisms. We have a tremendous opportunity to help people and a tremendous opportunity for partnering in our science. ■

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SOCIETY FOR NEUROSCIENCE
11 Dupont Circle, NW
Suite 500
Washington, DC 20036
info@sfn.org
www.sfn.org

SOCIETY FOR NEUROSCIENCE
11 Dupont Circle, NW
Suite 500
Washington, DC 20036

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PAID
Washington, DC
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