THE NIH CATALYST

A PUBLICATION ABOUT NIH INTRAMURAL RESEARCH

NATIONAL INSTITUTES OF HEALTH • OFFICE OF THE DIRECTOR | VOLUME 22 ISSUE 3 • MAY-JUNE 2014

The Other Brain

Neuron-Glia Interactions

BY RACHEL SCHEINERT, NIMH

President Barack Obama's Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative, launched April 2, 2013, promised to "accelerate the development and application of new technologies that will enable researchers to produce dynamic pictures of the brain that show how individual brain cells and complex neural circuits interact at the speed of thought." At first, some neuroscientists were dismayed because the plan seemed focused on mapping neuronal connections. What about glia, the non-neuronal cells that make up most of the brain? There are about 100 billion neurons in the human brain and many more glia.

Fortunately, the NIH BRAIN working group that is creating a plan to accomplish the BRAIN Initiative's goals recognized the importance of glial cells. In its interim report in September 2013, the group identified several high-priority research areas including generating "an integrated, systematic census of neuronal and glial cell types." The mention of glia was a huge step for the once neuron-centric field.

Although glial cells have traditionally been thought of as passive support cells in the nervous system, they are getting a starring role in the new Neuron-Glia Interactions (NGI) Scientific Interest Group (SIG). Glia, once considered to be simply the "glue" holding neurons in place, are proving to be diverse in origin, shape, and function.

CONTINUED ON PAGE 14

The Porter Neuroscience Research Center

A Foundation Built on Collaboration

BY RACHEL SCHEINERT, NIMH, AND LAURA STEPHENSON CARTER

BILL BRANSON

An artist's rendition no more. The recently completed John Edward Porter Neuroscience Research Center brings together scientists—from 10 different institutes and centers—who are collaborating on neuroscience research.

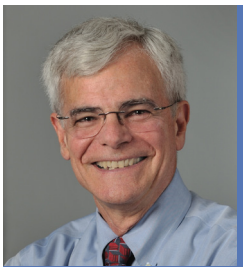
Just as the brain is a complex network of neurons, glia, and circuits, NIH's recently completed John Edward Porter Neuroscience Research Center (PNRC) comprises a complex network of researchers, representing different institutes and disciplines, who are all focused on neuroscience. One of the largest neuroscience research facilities in the world, this state-of-the-art structure will bring together more than 800 scientists—from 10 institutes and centers—who will be working side by side sharing both resources and ideas in an effort to advance the understanding of the nervous system in health and disease.

CONTINUED ON PAGE 10

CONTENTS

FEATURES • |1| The Other Brain |1| The Porter Building |3| Jumpstarting Genomics Medicine |6| Postbac dentist-to-be |9| Artificial Sweeteners; Impaired Lipid Storage |15| Senator Mikulski Working Her Earrings Off |17| NIHers Chosen for Forbes' 30-under-30 List

DEPARTMENTS • |2| DDIR: AAHRPP accreditation |4, 5| Training Pages: FelCom Outreach; Plain Language Posters |4|Abbreviations |7| News You Can Use: My Journal Shelf; 3D Printing Pilot |8| Research Briefs |13| News Briefs; SIG Beat |16| Colleagues: Recently Tenured |18| Announcements |20| Photographic Moment: The Dalai Lama Visits NIH



Accreditation of NIH's Human-Subjects Research Protections Program

BY MICHAEL GOTTESMAN, DDIR; AND LYNNETTE NIEMAN, DIRECTOR, OHSRP

From the time its Clinical Center opened in the 1950s, NIH has been a leader in conducting clinical research under a complex oversight system that reflects legal and regulatory requirements and international ethical standards. We are pleased to announce that the high quality of our human-subjects research protections program was recognized recently when the Association for the Accreditation of Human Research Protection Programs (AAHRPP) awarded full accreditation to the NIH intramural research program.

Ethical standards for such research are rooted in the Nuremberg Code (1949), which reflected the verdict of the Nuremberg trial of 23 Nazi physicians who had conducted medical experiments on prisoners of war. The Code laid out 10 ethical standards that guided research involving human subjects.

In 1953, Dr. **Roy Hertz** admitted the first patient to the NIH Clinical Center (CC). In addition, the CC's Medical Committee codified a policy for the protection of human subjects. It stipulated that each proposal should be reviewed by individuals who were not involved in a study. This process was the forerunner of the Institutional Review Boards (IRBs) that ensure the protection of human subjects today.

In 1955, Dr. **Min Li**, in collaboration with Dr. Hertz, administered methotrexate to a woman with advanced choriocarcinoma (a cancer that occurs in pregnancy) and achieved a cure. This amazing success was just one of many advances that have emerged from the CC. All of the studies were reviewed beforehand to ensure the protection of human subjects.

The NIH continued to play a central role in the development of human-research ethics, setting policy for extramural investigation in 1966. Federal policy was codified further in 1974, when a commission was formed to evaluate the existing system, resulting in the 1978 *Belmont Report* entitled "Ethical Principles and Guidelines for the Protection of Human Subjects of Research." This report led to the Code of Federal Regulations that governs all federally funded research today.

Some have asked why the NIH—with its long history of ethical treatment of human subjects and proven contributions to human health—would go through AAHRPP's rigorous assessment process. It is worth noting the benefits of accreditation. One benefit has been to achieve a more consistent "One NIH" human-subjects protections program rather than multiple approaches at different institutes and centers (ICs).

- The NIH has codified many existing policies into 49 standard operating procedures (SOPs), which address issues ranging from IRB composition and standards for protocol review to the protection of vulnerable subjects (including employees) and processes for extramural collaborations. (http://ohsr.od.nih.gov).
- We now have a uniform process for capturing important information about protocols and for reminding investigators of federal regulations and NIH policy.
- The harmonization of ICs' policies and adoption of best practices has increased consistency and streamlined processes. This consistency will facilitate the use of the CC by extramural investigators.

As part of the accreditation process, NIH has also implemented SOPs, collaborated across ICs, and educated the entire community about human-subjects protections. At the AAHRPP site visit in early January, a team of six reviewers interviewed nearly 300 NIH staff—including NIH and IC leadership; IRB chairs, members and staff; investigators; research staff; quality-assurance monitors; and pharmaceutical development and radiation-safety representatives—at the CC; the National Institute of Drug Abuse in Baltimore; and the National Institute of Environmental Health Sciences in Research Triangle Park, North Carolina.

The site visitors were impressed with the "vigor and enthusiasm" shown by all those involved in human-subjects protections at the NIH. We are grateful for the outpouring of energy and effort from the entire NIH human-subjects research community that made accreditation possible.

To achieve continued success of our accreditation program and clinical research, NIH must stay true to its mission of improving human health. That mission has always been intertwined with dedication to the ethical treatment of our human subjects. As you have read on posters around NIH, groundbreaking clinical research and human-subjects protections go hand in hand. ●

Lynnette Nieman is the director of the Office of Human Subjects Research Protections and a senior investigator in the Section on Reproductive and Adult Endocrinology in the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development.

Jump-Starting Genomic Medicine

New Program at the NIH Clinical Center

BY RAY MACDOUGALL, NHGRI

NIH clinical researchers will be using genomic data in many areas of clinical research in the coming decade, according to **Michael Gottesman**, NIH's deputy director for intramural research. To advance this goal, he is backing a new, two-year initiative called the Clinical Center Genomics Opportunity (CCGO).

"We're trying to jump-start genomic medicine," Gottesman said. "We first need to build an infrastructure for clinical genomic sequencing that can be used by researchers in their projects at the NIH Clinical Center."

The CCGO program will underwrite the DNA sequencing and analysis of a total of 1,000 exomes, which are the functionally important one to two percent of an individual's genome that codes for proteins. Until now, only a few clinical research projects in the NIH intramural program have included exome sequencing. Instead, they have relied on clinically observable information and the targeted sequencing of specific candidate genes often suggested by that information.

"It's as if we were missing a whole dimension—like living in Flatland and wanting the third dimension to navigate the landscape of the disease you're studying," Gottesman said. He believes a combination of both observable and genomic data will be immensely valuable in understanding human health and improving the prevention, diagnosis, and treatment of disease.

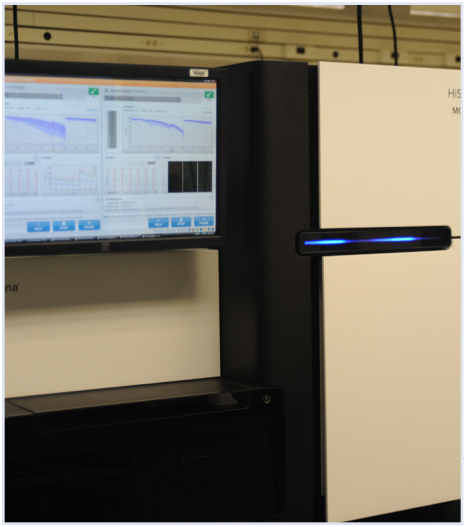
Set to launch this summer, the CCGO program will begin with a review committee's selection of projects that take advantage of the Clinical Center's phenotyping resources—the imaging, the detailed documentation of physiological changes in patients, and the annotations of medical consequences of diseases. The successful applicants will be awarded 50 to 300 exome sequences derived from patient samples. The samples will be collected at the Clinical Center and sequenced at the NIH Intramural Sequencing Center, a specialized facility for high-throughput, next-generation sequencing operated by the National Human Genome Research Institute (NHGRI). Investigators who receive exome data through CCGO will receive help handling the data and navigating challenges associated with the interpretation and return of clinical genetic results.

"The initiative will help investigators take advantage of genomic technologies and develop capabilities to work with genomic data from clinical-research patients," said **Leslie Biesecker**, chief of NHGRI's Medical Genomics and Metabolic Genetics Branch and an early adopter of clinical genomics at NIH. "NIH investigators will advance their own research. CCGO will develop the infrastructure and pipeline within the Clinical Center to begin to manage genomic data in a clinical context."

"We're trying to build infrastructure and apply genomic approaches to many different clinical-research challenges," said NHGRI Scientific Director **Daniel Kastner**. "CCGO is a way of laying the groundwork for this pipeline."

Proposed by Biesecker and Kastner, the new program received enthusiastic support from Gottesman and the Clinical Center.

"The NIH Clinical Center is the best place in the world to do detailed characterization of the disease phenotypes and natural histories of rare and unusual disorders," said NIH Clinical Center Director **John Gallin**. "This program will harness genomics to help us solve otherwise insoluble problems and get answers in much less time. It's a great synergy of resources and an important project that will transform our emphasis on disease prevention."



MAGGIE BARTLETT, NHGRI

The DNA sequencer at the NIH Intramural Sequencing Center will be used to generate exome data on participants in NIH clinical research.

"There's no doubt that exomes and genomes can be used to figure out the genetic cause of a lot of different kinds of disorders," said Biesecker. "We also know that genome data can be used to enhance medical care and we want to figure out how to take best advantage of these data."

CCGO will be inviting applications from principal investigators—at institutes that participate in the NIH Clinical Center—who are knowledgeable in genetics but do not currently have a major research program in clinical genomics.

"At some time in the future, I imagine we will be sequencing everybody—maybe full whole-genome sequencing, but there's a lot we need to learn [between] here [and] there," Gottesman said. "We expect the CCGO initiative to have a long-term impact on how genomic medicine is practiced." ●

Intramural investigators interested in applying to participate in the CCGO program should contact Leslie Biesecker at lesb@mail.nih.gov.

FROM THE FELLOWS COMMITTEE

Flourishing beyond the Bench

BY PATRICIA FORCINITO, NIDCR, AND WENDY KNOSP, NIDCR

NIH's Fellows Committee (FelCom) offers a variety of activities and useful resources for trainees, including the opportunity to participate in community-service activities through its Service and Outreach Subcommittee (SOS). Recently, the SOS partnered with fellows from the Uniformed Services University of the Health Sciences as well as with local Cub Scout and Girl Scout troops to host the annual "Safra Spring Fling" at NIH's Edmond J. Safra Family Lodge.

The Safra Lodge provides a homelike temporary residence for families and loved ones of adult patients being treated in the NIH Clinical Center. Although the Lodge provides free onsite housing, it is unable to offer meals beyond a free continental breakfast. Residents may choose to eat out or shop locally for groceries and prepare meals in the Lodge's communal kitchen. But every year since 2011, the SOS has hosted a luncheon that brings food, crafts, and cheer to residents.

MARCOS VANELLA

The fellows who orchestrated a luncheon for the residents of NIH's Safra Lodge, a temporary home for families and loved ones of adult patients at the NIH Clinical Center. Back row, from left: Tilman Rosales (NHLBI), Patricia Forcinito (NIDCR), Shu Hui Chen (NIAID), Catherine Vrentas (NIAID). Front row, from left: Jenny Kim (NHGRI), Jia Yan (NIAAA).

In addition to the annual luncheon, the SOS also conducts an NIH-wide food drive to stock the Safra Lodge pantry. These items help families and caregivers who arrive late at night, who don't have time to shop during the day, or who are having financial difficulties. SOS welcomes the opportunity to give back to the NIH community by helping Clinical Center patients, their families, and other loved ones.

The SOS brings fellows together in other ways to give back to the NIH and Greater Washington, D.C., communities. Fellows can volunteer to participate in group-service projects throughout the region; to judge science fairs at local schools or participate in other science-related activities; or be involved in non-group-service programs.

SOS is but one of many of FelCom's activities. FelCom represents the needs and concerns of clinical and basic science fellows, advocates for fellows, provides mentoring and career-development opportunities, and has developed a fellowship network within the NIH community. The committee works closely with the Office of Intramural Training and Education, the Office of Intramural Research, and each institute's training directors.

FelCom meets monthly to discuss issues relevant to and concerns of clinical and basic research fellows; meetings are the first Thursday of every month at 4:00 p.m. in Wilson Hall (third floor, Building One). All are welcome to attend. ●

If you would like to become involved or find out more about Felcom, visit https://www.training.nih.gov/felcom.

NIH ABBREVIATIONS

CBER: Center for Biologics Evaluation and Research, FDA
CC: NIH Clinical Center
CCR: Center for Cancer Research, NCI
CDC: Centers for Disease Control and Prevention
CIT: Center for Information Technology
DCEG: Division of Cancer Epidemiology and Genetics, NCI
FAES: Foundation for Advanced Education in the Sciences
FARE: Fellows Award for Research Excellence
FelCom: Fellows Committee
FDA: Food and Drug Administration
FNL: Frederick National Laboratory
IRP: Intramural Research Program
HHS: U.S. Department of Health and Human Services
NCATS: National Center for Advancing Translational Sciences
NCCAM: National Center for Complementary and Alternative Medicine
NCBI: National Center for Biotechnology Information
NCI: National Cancer Institute
NEI: National Eye Institute
NHGRI: National Human Genome Research Institute
NHLBI: National Heart, Lung, and Blood Institute
NIA: National Institute on Aging
NIAAA: National Institute on Alcohol Abuse and Alcoholism
NIAID: National Institute of Allergy and Infectious Diseases
NIAMS: National Institute of Arthritis and Musculoskeletal and Skin Diseases
NIBIB: National Institute of Biomedical Imaging and Bioengineering
NICHD: Eunice Kennedy Shriver National Institute of Child Health and Human Development
NIDA: National Institute on Drug Abuse
NIDCD: National Institute on Deafness and Other Communication Disorders
NIDCR: National Institute of Dental and Craniofacial Research
NIDDK: National Institute of Diabetes and Digestive and Kidney Diseases
NIEHS: National Institute of Environmental Health Sciences
NIGMS: National Institute of General Medical Sciences
NIMH: National Institute of Mental Health
NIMHD: National Institute on Minority Health and Health Disparities
NINDS: National Institute of Neurological Disorders and Stroke
NINR: National Institute of Nursing Research
NLM: National Library of Medicine
OD: Office of the Director
OITE: Office of Intramural Training and Education
OIR: Office of Intramural Research
ORS: Office of Research Services
ORWH: Office of Research on Women's Health
OTT: Office of Technology Transfer

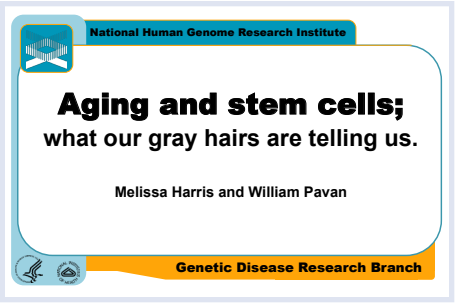
Scientific Posters in Plain Language

The Lay Audience Includes Potential Collaborators and Funders

BY JOHN DANIELS, NHGRI

When you think of a scientific poster, you may picture minutely detailed text of dense information colored only by a bar graph or a grossly enlarged microscopic image. But at a symposium held at NIH in December 2013, researchers from the National Human Genome Research Institute (NHGRI) experimented with a new approach: translating their posters into language accessible to the lay public. Of the more than 100 posters presented during the symposium, 11 were of the plain-language variety.

One of the plain-language posters, presented by NHGRI staff scientist **Christopher Marcum**, depicted an analysis of families and social networks of people with Lynch syndrome, an inherited genetic condition that greatly raises the risk of colorectal cancer and many other cancers. With the help of summer intern **Allie Rosen** (an undergraduate student at Brown University in Providence, R.I.), Marcum rewrote the abstract that had appeared on Rosen's traditional scientific poster—"The Influence of Biological, Generational, and Social Distance on Network Communication about Genetic Testing in Families with Lynch Syndrome." He renamed the poster "Communication is Key! Understanding How Families at Risk for Cancer Talk About Genetic Testing and Counseling through Social Networks" and replaced the complex graphs and long formulas with simpler, easy-to-understand images.



Melissa Harris, a postdoctoral fellow in NHGRI's Mouse Embryology Section in the Genetic Disease Research Branch, enjoyed being creative as she crafted her plain-language poster on gray hair and aging.

The process of translating complex information for a nonscientific audience was not easy…but it was worthwhile. "We have to be able to communicate scientific ideas not just to Congress and policymakers, but also to the average person," he said. "I want to start integrating plain language into the discussion of scientific papers."

The 2013 symposium was the first time that NHGRI included posters that swapped the complex and technical language of traditional scientific posters for images, graphics, and simple language geared to the average person.

"In their research, [scientists] are looking at a lot of specific and very important details," said NHGRI Scientific Director **Dan Kastner**, whose office organized the symposium. "As they advance in their careers, they will need to be able to explain the science to regular people."

To get started on her plain-language poster, NHGRI postdoctoral fellow **Melissa Harris** read magazines such as *Scientific American* to see how its writers present information to intelligent, non-scientist audiences. She figured out how to use terminology she knew her mother would understand and defined all technical terms.

Entitled "Aging and Stem Cells: What Our Gray Hairs Are Telling Us," her poster explained in lay terms how understanding the process of hair graying in mice provides a window into biological changes that cause aging. In particular, she focused on melanocyte stem cells, which contribute to pigment production in hair follicles and disappear with age.

The experience "gave me the freedom to use my artistic side and to use language in a different way," said Harris. Still, she didn't want to make the science "so superficial that people don't take it seriously." As it turned out, the plain-language poster triggered many more in-depth conversations with attendees than did traditional posters. It was such a good experience that she expects to integrate plain language into her scientific posters from now on.

Here are Marcum's and Harris's tips for developing plain-language scientific posters:

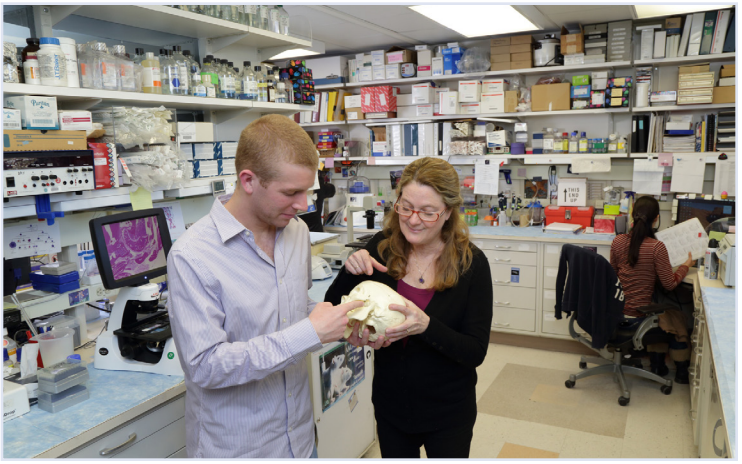
- Explain your research in the way you'd explain it to your parents or a friend who is not a scientist. Doing so will help you write an abstract that average people can understand.
- Don't assume that you're being too basic or that the science behind your research is common knowledge.
- Make sure to prepare in advance. Creating the poster may take longer than expected—as much as two to three days.
- Don't think that using plain language means you're undermining the significance of your work. The researchers received more interest in their plain-language posters than in their traditional ones. ●

To learn more about the plain-language initiative, which encourages the use of clear, concise language in all documents written for the public, other government entities, and fellow workers, go to http://www.nih.gov/clearcommunication. For a longer version of this article, including an example of the before and after of a plain-language poster, read the *NIH Catalyst* online at http://irp.nih.gov/catalyst/v22i3/the-training-page-plain-language-posters.

Preparing for Dental School

Deaf College Grad Wins Spot in NIH Lab

BY GERIANN PIAZZA, NIDCR



BILL BRANSON

Aspiring dentist Andrew Donald (left) and NIDCR investigator Marian Young (right) examining the temporomandibular joint in a plastic replica of the craniofacial bones in a human skull.

MARIAN YOUNG WAS BOWLED OVER when a recent college graduate e-mailed saying he wanted to help with her temporomandibular joint (TMJ) osteoarthritis research before he entered dental school. Although she gets many requests from students wanting to intern in her lab in the National Institute of Dental and Cranial Facial Research (NIDCR), "it's very rare to get a student with a specific interest in an area in which you're working," she said. The postbac—**Andrew Donald**—said that Young's work on jaw joints was related to a clinical case study he had done as an undergraduate.

Young wasted no time in inviting Donald to her lab for an interview. What she didn't know yet was that Donald could only communicate through American Sign Language or written or typed text.

But his deafness didn't faze Young, and she was eager to begin the interview. Rather than wait for a sign-language interpreter, they took turns typing on a laptop. Donald seemed so grounded and confident that Young immediately realized he'd be a great addition to her lab and "hired" him as soon as he got funding via a postbac Intramural Research Training Award (IRTA). Now they routinely use an iPad tablet computer to communicate by typing their conversations and often bring in sign-language interpreters from Access Interpreting, Inc. (Washington, D.C.), too.

"They are extremely helpful," said Young. "They are with us at least twice a week for our branch seminar and our extended lab meeting and for other occasions [such as] the matrix club I manage or for extra help with discuss[ions] with a special guest to explain how we work with the TMJ."

Young, who is chief of NIDCR's Molecular Biology of Teeth and Bones Section in the Craniofacial and Skeletal Diseases Branch, investigates extracellular matrix (ECM) proteins in skeletal tissue. She focuses on how small proteoglycans may play a role in controlling pathological skeletal conditions such as osteoporosis and osteoarthritis. In her TMJ research, her lab is working with genetically modified mice that are deficient in genes for two proteoglycans—biglycan and fibromodulin—that are normally abundant in the TMJ. Mice with both mutant genes develop features of classic osteoarthritis and loss of ECM in their TMJs.

Donald wanted to better understand how research provides evidence that can be translated into the clinical practice of dentistry. His contributions to Young's research included mastering the tricky three-dimensional imaging of bone with microcomputed tomographic (micro-CT) methods and writing standard operating procedures.

He was surprised by how long it takes to do research. In school, students typically do a lab once but in a research lab, "you do things over and over again in order to become proficient," he said. Nevertheless, he grew to appreciate that the lab procedures helped him to understand "what is happening with the bone, with teeth movement, and how the mandible is involved."

Before working in Young's lab, Donald earned a B.S. degree in biomedical sciences from the Rochester Institute of Technology (Rochester, N.Y.). In addition to being a postbac IRTA, he participated in the NIH Academy to advance his knowledge about health disparities. He is particularly interested in ensuring that deaf people have access to dental care. He's also developing a blog and videos that explain dental terms in sign language so deaf people have the opportunity to be more educated about dental care before they go to the dentist.

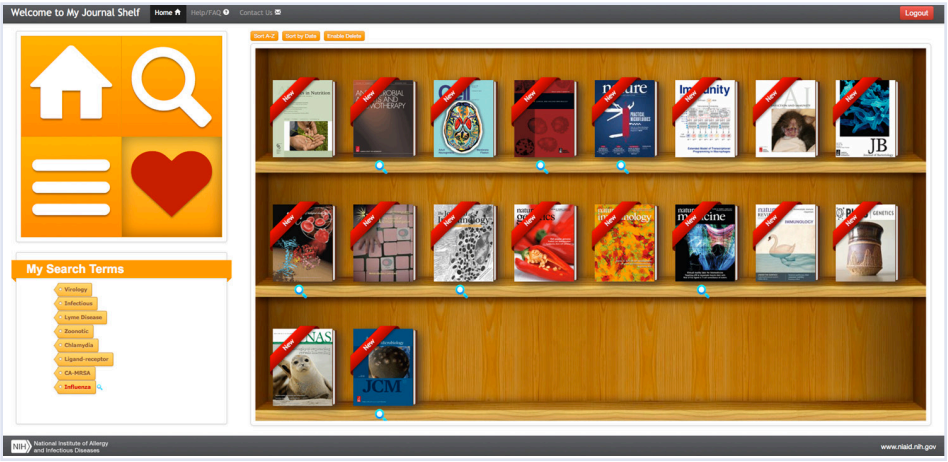
This summer Donald begins the four-year program at the University of Maryland School of Dentistry (Baltimore). In 2018, he plans to begin working in his dentist's thriving practice in Maryland and hopes one day to have a practice of his own. His dentist is also deaf.

"I am really happy [at NIH] conducting a dental research project," he said. "And I definitely feel more comfortable and ready to go to dental school." ●

For more information on the NIH Academy, which trains postbacs to do research on health disparities, visit https://www.training.nih.gov/new_nih_academy_home or contact Shauna Clark (clarkshauna@od.nih.gov).

My Journal Shelf

BY SANDHYA XIRASAGAR, NIAID



Scientific innovation often relies on the ability to quickly spot new advances and hot topics in interdisciplinary areas. But it can be a challenge to sift through the vast literature for relevant findings, resources, approaches, and methodologies. How can anyone possibly keep up with current advances in multiple disciplines?

Enter My Journal Shelf, a virtual library shelf chock-full of your favorite biomedical journals. It's a publicly accessible, simple-to-use, and researcher-friendly Web tool that allows you to efficiently browse and search the latest biomedical journals. My Journal Shelf started out as a collaborative pilot project between the National Institute of Allergy and Infectious Diseases (NIAID) Division of Intramural Research and NIAID's Office of Cyber Infrastructure and Computational Biology (OCICB). It was led by senior investigator **Michael Lenardo** and me (I'm a project manager in OCICB). Now the project is available to everyone at NIH.

Cover images of the most recent issues (updated nightly) of NIH e-access journals are displayed and are linked to their table of contents on the publishers' Web sites. Users can get a snapshot of highlighted research featured on the journal covers. The journals on the shelf are based on the preferences of NIH researchers and only include those for which permission is granted by the publishers. NIAID is working with other journal publishers and the NIH Library subscription team to add other covers to the shelf.

Users can customize their profiles to include favorite journals, search-term lists, and more. Integration with the NIH remote access to subscribed e-access literature and iPad compatibility enables anytime, anywhere access. The PubMed search tool allows users to perform keyword searches of current articles so all citations from the most recent issues can be filtered by the search criteria. Retrieved citations are linked to PubMed abstracts.

NIH researchers can login using NIH credentials to customize My Journal Shelf: Create a personalized shelf with your favorite journals; store a personalized search-term profile; choose whether to search all journals displayed or a combination of them; and select how to have retrieved citations sent to you. Authentication also allows users to remotely access full-text articles via the NIH library's proxy servers for remote access. There are other special features, too.

So what are you waiting for? See for yourself how great this tool is at My Journal Shelf (http://journalshelf.niaid.nih.gov). ●

3-D Printing Pilot

June 2–August 29, 2014

BY MASHANA DAVIS

Need to print something in three dimensions (3-D)? Participate in a free 3-D–printing pilot program through the NIH Library's Technology Sandbox (http://nihlibrary.nih.gov/Sandbox/Pages/default.aspx), a new collaborative space in Building 10 offering NIH staff an opportunity to share and explore new technologies, including NIH-developed applications and projects. During the pilot, NIH staff will have access to a Makerbot Replicator 2 and a Sense 3-D scanner. Before printing, you will be required to attend a 30-minute orientation. Printed models must be related to your NIH work or research. In addition, you will be asked to complete a post-print evaluation. The goal of this pilot is to allow NIH staff the opportunity to explore 3-D printing and to assess the need for this service at NIH. Have questions or need more information? E-mail the NIH Library Technology Sandbox Team at NIHLibraryTechnologySandboxProject@mail.nih.gov.

NIH LIBRARY'S TECHNOLOGY SANDBOX

In May, the NIH Library will open a new collaborative space in Building 10 called the "Technology Sandbox," a creative digital commons for the NIH and HHS communities to explore, develop, and share new technology. The Sandbox is located on the first floor of the library and divided into three activity zones: **Collaboration Zone**, featuring two pods, each equipped with a PC, plasma screen, headphone sockets, and a whiteboard; **Information Zone**, offering reference and circulation services, a place to reserve the collaboration pods and other technology, and staff who can provide technology consultations; and "**Storefront**," an area to explore innovative hardware and software projects developed at the NIH, including a Makerbot 3-D printer, Apple and Android devices, and bioinformatics workstations. For more information contact NIHLibraryTechnologySandboxProject@mail.nih.gov. ●

Intramural Research Briefs

NIA: NEW GENE MUTATION ASSOCIATED WITH ALS AND DEMENTIA

An NIA-led team of scientists has found a rare gene mutation associated with amyotrophic lateral sclerosis (ALS), often referred to as Lou Gehrig's disease. ALS is a rapidly progressive, fatal neurological disorder that kills about 6,000 Americans each year; about 10 percent have an inherited form of the disease.

Working with DNA samples from families in which several people had been diagnosed with ALS and dementia, the investigators used exome sequencing—a technique in which the entire coding regions of DNA are sequenced—to identify the mutation in the *MATR3* gene, which encodes the protein matrin 3. Further investigation revealed an interaction between matrin 3 and transactive-response DNA-binding protein 43 kDa, an RNA-binding protein whose mutation is known to cause ALS.

The identification of this mutation in *MATR3* gives researchers another target to explore in the pathogenesis of ALS and provides additional evidence that some disruption in RNA metabolism is involved in neuron death in ALS. (NIA authors: J.O. Johnson, R. Chia, A.E. Renton, H.A. Pilner, Y. Abramzon, G. Marangi, J.R. Gibbs, M.A. Nalls, A.B. Singleton, M.R. Cookson, B.J. Traynor, *Nat Neurosci* DOI:10.1038/nn.3688)

NIEHS: OBESITY PRIMES COLON FOR CANCER

Obesity, rather than diet, causes changes in the colon that may lead to colorectal cancer, according to an NIEHS study using mice. A large body of scientific literature says people who are obese are predisposed to a number of cancers, particularly colorectal cancer. To better understand the processes behind this link, the researchers fed two groups of mice a diet in which 60 percent of the calories came from lard. The first group contained a human version of the gene *NAG-1*, which has been shown to protect against colon cancer in other studies. The second group lacked the gene.

The *NAG-1* mice did not gain weight after eating the high-fat diet, while mice that lacked *NAG-1* grew plump. The scientists also noticed that the obese mice exhibited molecular signals in their gut that led to the progression of cancer. The researchers want to determine exactly how obesity prompts the body to develop colorectal cancer in hopes of one day being able to design ways to treat or prevent colorectal cancer in obese patients. (NIEHS authors: R. Li, S.A. Grimm, K. Chrysovergis, J. Kosak, X. Wang, Y. Du, A. Burkholder, T.E. Eling, P.A. Wade, *Cell Metab* **19**:702–711, 2014)

NHLBI: WHY MANY VEIN GRAFTS FAIL

NHLBI researchers, with the help of other scientists, have identified a biological pathway that contributes to the high rate of vein-graft failure after bypass surgery. Using mouse models of bypass surgery, they showed that excess signaling via the transforming growth factor–beta (TGF-beta) family causes the inner walls of the vein to become too thick, slowing down or sometimes even blocking the blood flow that the graft was intended to restore. Inhibition of the TGF-beta signaling pathway reduced overgrowth in the grafted veins. The team identified similar properties in samples of clogged human vein grafts, suggesting that select drugs might be useful in reducing vein-graft failure in humans. (NHLBI authors; J. Nevado, D. Yang, C. St. Hilaire, A. Negro, F. Fang, G. Chen, H. San, A.D. Walts, R.L. Schwartzbeck, B. Taylor, J.D. Lanzer, A. Wragg, A. Elagha, L.E. Beltran, C. Berry, J.C. Kovacic, M. Boehm, *Sci Transl Med* **6**:227ra34, 2014)

NICHD: HIGH PLASTICIZER LEVELS IN MALES LINKED TO DELAYED PREGNANCY FOR FEMALE PARTNERS

Women whose male partners have high concentrations of three common forms of phthalates, chemicals found in a wide range of consumer products, take longer to become pregnant than women in couples in which the male does not have high concentrations of the chemicals, according to researchers at NICHD and other institutions.

The scientists assessed the concentrations of phthalates in 501 couples trying to achieve pregnancy. Phthalates, sometimes known as plasticizers, are used in the manufacture of plastics to make them more flexible. BPA is also used in plastics, including in some food and drink packaging. Future studies are needed to determine whether the compounds affected particular aspects of reproductive health, such as hormone concentrations. (NICHD authors: G.M. Buck Louis, Z. Chen, R. Sundaram, L. Sun, *Fertil Steril* **100**:162–169.e2, 2013)

NIDDK: RESEARCHERS BETTER UNDERSTAND RECEPTORS THROUGH NOVEL MOUSE MODEL

A team of NIDDK scientists have discovered a way to better comprehend how certain receptors work. The scientists created the first mouse model enabling them to detect cells in which a G-protein coupled receptor (GPCR) has been triggered. In this case, the specific GPCR recognizes a lipid signal called sphingosine-1-phosphate, important for controlling inflammation, a process that occurs when the body is injured. GPCRs are not only triggered by environmental signals related to tastes, odors, invading pathogens, and more but are also targets for nearly half of all medications used today. The new mouse model not only will allow a better understanding of how GPCRs work in the body but also may help in the development of new medicines to combat diseases in which inflammation is involved. (NIDDK authors: M. Kono, A.E. Tucker, J. Tran, J.B. Bergner, E.M. Turner, R.L. Proia, *J Clin Invest* DOI:10.1172/JCI71194)

CONTRIBUTOR: KRYSTEN CARRERA, NIDDK

Read more online at http://irp.nih.gov/catalyst/v22i3/research-briefs.

Artificial Sweeteners and Leptin; Impaired Lipid Storage and Starvation

Two NIH Female Postdocs Discuss Their Research

BY LYNN S. ADAMS, OFFICE OF RESEARCH ON WOMEN'S HEALTH

CLARISA BUCKNER, NIAID

The recent NIH Women Scientist Advisors Scholars Seminar—which Deputy Director for Intramural Research Michael Gottesman (center) attended—featured presentations by two female postdocs: Sarah Cohen (left) who is exploring new ways to image and analyze the activities of lipid droplets during starvation; and Wei-na Cong (right) who described the effects of artificial sweeteners on metabolism and cognitive function in mice.

The potential negative health effects of artificial sweeteners and the activities of cellular lipid droplets during starvation took center stage at NIH's Women Scientist Advisors (WSA) Scholars Seminar, which featured the research accomplishments of two female postdoctoral fellows. **Wei-na Cong** described the effects of the artificial sweetener acesulfame potassium (ACK) on metabolism and cognitive function in mice. **Sarah Cohen** discussed the roles of lipid droplets in cellular responses to starvation. The women were selected as WSA scholars from the pool of 2014 Fellow Award for Research Excellence (FARE) awardees.

Wei-na Cong, a postdoc in the laboratory of **Bronwen Martin** and **Josephine Egan** at the National Institute of Aging, described how mice that ingested ACK for 40 weeks—at a dose that is equivalent to what people frequently consume—produce higher concentrations of circulating insulin and leptin, hormones important in sugar metabolism and appetite control.

"We think the higher insulin was caused by ACK['s] stimulating pancreatic cells to excessively secrete insulin," Cong explained. "The increased leptin levels occurred because the mice became resistant" to leptin.

Her studies also revealed that ACK accumulated in the mice's brain tissue and that the mice exhibited decreased cognitive function in the form of slow learning and impaired memory. ACK also affected energy metabolism in brain neuronal cells, inducing an "energy crisis" in the cells. This work suggests that long-term ACK use may contribute to the development of cognitive disorders such as Alzheimer disease. Cong hopes that her research will contribute to the development of better public guidance for the use of artificial sweeteners.

Before joining NIH, Cong did postdoctoral research at the Hospital for Sick Children (Toronto) on the effects of leptin signaling on hepatic apolipoprotein B100 metabolism. She has presented her research at international conferences and published 16 peer-reviewed manuscripts, including a recent paper on her current research (*PLoS ONE* **8**(8):e70257, 2013).

Sarah Cohen is exploring new ways to image, analyze, and model the role of lipid droplets in the cellular response to starvation. Lipid storage in cells is important: Organisms can draw from the lipid (fat) stores to generate energy during times of starvation. In disorders such as obesity and diabetes, the storage and use of lipids are impaired.

Cohen is using fluorescence microscopy to view the insides of cells and determine how the lipid-droplet lifecycle is influenced by starvation, how lipids interact with and are exchanged between organelles, and what mechanisms are used in the release and storage of lipids. In particular, she is investigating how lipid droplets interact with mitochondria—the "energy factories" of the cell—which are important for cell survival.

By observing cells in culture, Cohen discovered that during periods of starvation, a process called autophagy—in which the cell breaks down its own contents to produce energy—causes the organelles to release fatty acids and thereby increase the production of lipid droplets. She also found that lipases, cellular enzymes that break down lipids, liberate fatty acids from lipid droplets for transport to the mitochondria. When this process is impaired in metabolic diseases such as diabetes, lipid storage and use may be impaired.

These discoveries are important for understanding the underlying mechanisms of disease and identifying potential treatments. "Those proteins could be potential drug targets," Cohen said.

Cohen, who is a postdoc in **Jennifer Lippincott-Schwartz's** laboratory in the National Institute of Child Health and Human Development, recently published her graduate research on parvovirus (*PLoS Pathog* **9**(10):e1003671, 2013). ●

The NIH WSA Scholars Seminar was sponsored by WSA and the NIH Office of Research on Women's Health. To learn more about the history and activities of the WSA, visit http://sigs.nih.gov/wsa/Pages/default.aspx.

Porter

CONTINUED FROM PAGE 1

On March 31 and April 1, a scientific symposium and dedication ceremony were held to celebrate the completion of the center. One of the featured speakers at the dedication was none other than John Edward Porter, the former Congressman from Illinois (1980–2001) for whom the center is named. Porter used to chair the House Appropriations subcommittee that oversaw the NIH budget. He played a key role in the doubling of the NIH budget (1998–2003) and in getting Congress to provide funds to create a national neuroscience research center on NIH's Bethesda campus.

Among the celebrants were the two visionaries for the center—**Gerald Fischbach** and **Steven Hyman.** Fischbach was director of the National Institute of Neurological Disorders and Stroke (NINDS) from 1998 to 2001; Hyman was director of the National Institute of Mental Health (NIMH) from 1996 to 2001.

"The vision that Gerry and Steve had was to bring together intramural scientists from multiple institutes—who were working in 10 different buildings across campus—into one building and then to arrange them not by institute but by the questions they were asking and the techniques and tools they were using," said NINDS Director **Story Landis** at the opening of the scientific symposium. "So the Porter Building in effect put the brain back together."

ERNIE BRANSON

Former Congressman John Edward Porter (from Illinois), who played a key role in doubling the NIH budget during his term in office, was the guest of honor at the dedication of the neuroscience center that is named for him.

"It's one thing to dream; it's another to get things done," said Fischbach, who is now chief scientist and fellow of the Simons Foundation (New York). "It was a dream then and everyone here worked very hard to make the dream come true."

"Neuroscience was born interdisciplinary," said Hyman, now the director of the Stanley Center for Psychiatric Research at the Broad Institute (Cambridge, Mass.). He spoke of wanting a building full of light and open spaces for people with shared intellectual interests to meet.

The PNRC is actually two buildings and was designed in two phases between 2001 and 2014. Phase I, completed in 2004, was designed by architect Rafael Viñoly and Phase II by the architectural firm Perkins and Will. The Whiting-Turner Contracting Company handled the construction of both phases. The building process went smoothly with many service providers working as a team.

Designing and constructing the 500,000-square-foot multi-institute research facility took collaboration among scientists, architects, project managers, construction workers, technicians, utility workers, safety-management personnel, and more. Together they created a facility that would allow scientists to be flexible and keep up with ever-advancing technologies.

One of the special features of the complex is an open floor plan for the laboratories instead of lab benches that are hemmed in by walls. The open floor plan was meant to encourage researchers in neighboring labs to collaborate, explained Phase I Project Manager **Robert McDonald** in the Office of Research Facilities (ORF).

"We need[ed] flexible lab space and… an open plan [to give] scientific directors the flexibility to respond to change quickly," said Phase II Project Manager **Frank Kutlak**, also of ORF.

The scientists had other needs, too. "They asked for very specific things," such as closed rooms, low vibration for the sensitive electron microscopes, large areas that could be kept dark, shelving units suspended from above to accommodate electrophysiology equipment, and rodent holding facilities that were bigger than elsewhere on campus, said McDonald.

In fact, two committees—one made up of scientists and the other made up of technical experts in such areas as fire, radiation, environmental, and occupational safety; telecommunications; and building maintenance—offered recommendations that ensured that scientific and technical considerations were in balance. "The role of the technical committee…was to sort through the ideas and requests and work with the [scientists and the] design team to pick a path," said McDonald. "You can't go in every direction at the same time."

Some labs were custom-built, said **Rita Devine**, NINDS assistant director of science administration. For example,

LEFT

Porter I (left) completed in 2004, and Porter II, completed this year, are joined by a four-story atrium and make up the new Porter Neuroscience Research Center.

RIGHT

The safety-conscious construction workers celebrated more than 1.6 million man-hours without a lost-time accident. During Phase II (center), Porter I was shielded by a green wall (upper left).

PHOTOS: FRANK KUTLAK

researchers wanted the electrophysiology rooms free of the tangle of wires and utility lines that usually clutter the countertops. The solution? A hanging shelf to hold equipment and wires and an "umbilical cord" to house tubing for research gases. Another innovation was a premixed carbogen (carbon dioxide and oxygen) gas line so researchers didn't have to mix the two gases in the lab. (Carbogen is used to stabilize the pH in brain-slice cultures.)

In addition to labs, the complex includes small meeting rooms and break rooms scattered throughout each floor; workspaces for postdocs; offices for scientific directors and other administrative staff; a cafeteria and café; and a seminar center with a capacity of 350 people. Researchers have access to shared resources and facilities, too, including a 30,000-cage vivarium, the largest on-campus facility for rodents—complete with holding, procedural, and behavioral-testing rooms; a peptide-sequencing facility; a light-imaging facility; and even a specially shielded room for one of the world's largest research magnetic-resonance imaging (MRI) scanning devices, which has a magnetic strength of 18 Tesla (360,000 times as strong as the earth's magnetic field). The 18-Tesla MRI machine is scheduled for delivery this fall.

BILL BRANSON

The four-story atrium, which connects the two parts of the Porter complex, was overflowing with people who had gathered for the dedication ceremony. Note the three colorful skyboxes; they are conference rooms in disguise. The atrium will also be used as a public gallery where artworks and exhibits featuring neuroscience will be on display.

The complex also boasts several energy-efficient systems including high-performance window glazing, light-emittting diode (LED lighting), a chilled-beam mechanical system for heating and cooling, solar panels, and geothermal wells to provide supplementary cooling. Porter II is 25 percent more energy-efficient than a traditional laboratory building and is being assessed for Leadership in Energy and Environmental Design (LEED) and Green Globes green-building certifications.

Although the design for Phase II was ready in 2008, construction didn't begin until 2010 when NIH received monies from the American Recovery and Reinvestment Act.

Integrating the Phase II construction into the already completed Phase I of the Porter complex required coordination and communication, Kutlak explained. Town-hall meetings were held to keep researchers informed during the construction process, and every effort was made to avoid disrupting the ongoing research and animal housing in Porter I.

"It was hard at times to cope with the constant noise and mess of a long construction season," said postdoc **Ana Cruz** (NINDS). But "now that [the] building is finished, it feels nice to enjoy the new space."

ERNIE BRANSON

NIDCD Scientific Director Andrew Griffith proudly shows off the new research area to guests who toured the Porter complex on dedication day.

Collaborative Research

The two-day neuroscience-research symposium highlighted the collaborations already underway in the Porter complex and covered a broad range of topics: constructing neuronal circuits; the cell biology of neurons; genetics of nervous-system disorders; dissecting neural circuits; and how synapses share circuit function.

Leonardo Belluscio (NINDS) presented his research on the formation and maintenance of olfactory-bulb circuitry, a collaboration with **Heather Cameron**

CONTINUED ON PAGE 12

Porter

CONTINUED FROM PAGE 11

FRANK KUTLAK

The open lab space is designed to encourage interdisciplinary collaboration and communication; the architecture is flexible so it can accommodate change over time.

(NIMH), using experimental mice that cease to regenerate new neurons when fed the drug ganciclovir. Cameron also discussed her work on the function of new neurons in the adult hippocampus and their possible role in stress responses and emotion.

"I think the Porter building will act as a catalyst to essentially facilitate interactions and collaborations," said Belluscio, who is collaborating with several others including **Nick Ryba** (National Institute of Dental and Craniofacial Research, NIDCR).

Ryba is studying the receptors, cells, and coding logic for taste and he is working with Belluscio to understand how olfactory receptors "choose" which odorant receptors to express and how the choice affects neuronal wiring.

FRANK KUTLAK

Porter's offices, meeting rooms, and postdoc workspaces (shown here) get lots of sunlight.

Ryba's collaboration with **Mark Hoon** (NIDCR) who works on somatosensation (thermal and nociceptive stimulation and the sense of touch) at the molecular level, has largely been technical so far. They share mice and other resources as well as functional-imaging approaches. "But we hope to expand to work together on some specific aspects of pain sensation," Ryba added.

In fact, a new collaborative group including Hoon, **Jeff Diamond** (NINDS), **Wei Li** (NEI), and **Mark Stopfer** (National Institute of Child Health and Human Development, NICHD) will focus on various sensory systems including vision, taste, somatosensation and olfaction.

Sometimes collaborations are triggered by casual conversation. Pain researcher **Mark Pitcher**, a postdoc from the National Center for Complementary and Alternative Medicine (NCCAM), focuses on the effects of stress, pain, and pain related to anxiety and depression. "One day I stopped to chat with a [lab] neighbor who just happens to work on stress susceptibility and resilience," Pitcher began. "We struck up a collaboration. The intersection of these two areas—pain-related emotional disturbance and resilient [and] susceptible phenotypes—is a crucial 'missing link' in our understanding of chronic-pain-related disabilities."

"Being in Porter has made it a lot easier to exchange reagents or use equipment that my laboratory doesn't have," said postdoc **Eveline Arnold** (NINDS), who shares a confocal microscope with a nearby lab.

The Porter building is a "game changer," said NIDCD Scientific Director **Andrew Griffith**. For the past 20 years, he and most of the other NIDCD researchers were in leased spaced 12 miles from the Bethesda campus. Not only is he happy to be closer to the Clinical Center where he sees patients, but he is also looking forward to being able to collaborate with neighboring scientists. "The layout is one of the best I have ever seen," he said. "It both figuratively and literally removes walls between groups." For example, **Dennis Drayna** (NIDCD), who discovered gene mutations that may lead to stuttering, will be just downstairs from **Juan Bonifacino** (NICHD), a cell biologist specializing in protein trafficking controlled by those same genes.

FRANK KUTLAK

The Porter vivarium—which contains 30,000 cages, several procedure rooms, isolation cubicles, and behavioral-testing rooms—is the largest rodent facility on campus.

"You can do great work anywhere," said Ryba. "But having such a pleasant place to work filled with scientists with similar focus and complementary approaches will undoubtedly make it easier and more fun." ●

FRANK KUTLAK

The Porter complex features several energy-efficient systems including LED lighting, geothermal wells, and roof solar panels (shown here).

BILL BRANSON

The "Tree of Hippocrates" that was a gift to NIH from the Greek Embassy in the 1960s succumbed to fungal disease last year and had to be removed. This year, a clone of that tree was planted at NIH with the help of Deputy Director for Intramural Research Michael Gottesman (left), Greek Ambassador Christos P. Panagopoulos, and others.

HIPPOCRATES TREE RETURNS

NIH celebrated Arbor Day and DNA Day in one fell swoop on Friday, April 25, by hosting a ceremony to plant a clone (cutting) of the original "Tree of Hippocrates" on the lawn next to the National Library of Medicine (NLM). Special guest Greek Ambassador Christos P. Panagopoulos joined the festivities, too. The tree replaced one that the Greek Embassy had presented to NIH in 1961.

Hippocrates, the father of modern medicine, was born on the Greek island of Cos around 460 B.C.E. According to legend, he taught medical students in the shade of an Oriental plane tree, or *Platanus orientalis*. Members of the genus Platanus are known for their long life.

Two thousand plus years after Hippocrates, the "Tree of Hippocrates" became rooted in the history of NIH. In 1961, then Greek Ambassador Alexis Liatis presented the NLM with a cutting from a plane tree in Cos to mark the dedication of the library's new building on the NIH campus. Although only 500 years old, this plane tree may be a descendent of the one under which Hippocrates taught.

The tree at NIH grew and thrived. But in the 1980s, its health declined because of a fungal disease. NIH landscape architect **Lynn Mueller** spent decades trying to restore the tree's health while simultaneously exploring a clone. Eventually, he connected with the Archangel Ancient Tree Archive, which successfully cloned the historic tree. A second clone was also planted near the NIH Clinical Research Center on April 25.

The Smithsonian's Laboratories of Analytical Biology produced a genetic fingerprint of the Hippocrates Tree, too. Researchers extracted DNA from the bark of NIH's dead clone to produce the DNA sequence.

NIH CENTER FOR REGENERATIVE MEDICINE (CRM)

The report in *Nature* that the NIH CRM is being closed was mistaken (*Nature* **508:**157, 2014). Although it's true that CRM Director **Mahendra Rao**—who was appointed to that post in 2011—resigned in March 2014, the CRM continues, albeit in a new direction. According to its Web site, CRM "is at a transition point." To learn more, go to http://commonfund.nih.gov/stemcells.

WORKFORCE DIVERSITY

Welcome to **Hannah Valantine, M.D.,** NIH's first chief officer for Scientific Workforce Diversity, who will lead NIH's efforts to diversify the biomedical research workforce. Before coming to NIH, Valantine was the senior associate dean for diversity and leadership at the Stanford University School of Medicine (Stanford, Calif.) and professor of cardiovascular medicine at Stanford University Medical Center. Stay tuned for an in-depth article on Valantine in the near future. ●

NEWS FROM AND ABOUT THE NIH SCIENTIFIC INTEREST GROUPS

OUTCOMES AND EFFECTIVENESS RESEARCH

First Meeting on May 8

BY NANCY MILLER, NIA

Outcomes and effectiveness research (OER) is a field that describes, interprets, and predicts the effect of health-care interventions on endpoints that matter to patients, families, providers, payers, purchasers, and society in general. NIH has long supported a diverse portfolio of OER, including observational and randomized studies comparing different strategies to prevent, diagnose, treat, and monitor many diseases and conditions. With increased public interest, as evidenced by the Congressional legislation that created the Patient-Centered Outcomes Research Institute (PCORI) and by NIH's newly launched Common Fund efforts to support pragmatic clinical trials and to harness the power of "big data," there is growing need for effective trans-NIH communication.

The Trans-NIH OER Interest Group, a successor to the Trans-NIH Comparative Effectiveness Research Coordinating Committee, will function as a forum for institutes and centers to discuss matters of interest to the OER community. The OER SIG plans to convene eight to 10 meetings annually, serve as a forum for information exchange, and foster a stimulating learning environment—although not engage in policy development.

The OER SIG is chaired by **Richard Hodes** (NIA) and **Michael Lauer** (NHLBI). The inaugural meeting was held on Thursday, May 8, 11:00 a.m.–12:30 p.m. in Wilson Hall (Building 1). NIH Director **Francis Collins** introduced the OER SIG, and Richard Platt (Harvard-Pilgrim) and Rob Califf (Duke University) presented talks on "PCORnet (The National Patient-Centered Clinical Research Network): Building the Capacity for Faster, More Efficient, and Less Expensive Clinically Embedded Research." Contact **Nancy Miller** (nancy.miller1@nih.gov) for more information. ●

Neuron Glia

CONTINUED FROM PAGE 1

They are even being noted for their effect on functional activity and neural plasticity and their role in pathogenesis.

There are four major types of glia, all of which communicate with one another and with neurons via electrical and chemical signals: oligodendrocytes, astrocytes (or astroglia), microglia in the brain; and Schwann cells in the peripheral nervous system. Oligodendrocytes form the myelin sheath that insulates and provides metabolic support to axons in the brain. Astrocytes provide nutrients to neurons and regulate electrical signals. Microglia remove debris and provide a defense against infection. Schwann cells are similar to oligodendrocytes but perform their functions outside the brain. There are many other types, too, including satellite glial cells; glia in the enteric nervous system (of the gastrointestinal tract); and glia-like cells found in the peripheral nervous system such as in the inner ear.

"Glia literally have their feet in everything," said **Amy Shafqat**, a graduate student in the National Institute of Neurological Disorders and Stroke (NINDS), who was a driving force behind the creation of the NGI SIG. The SIG is co-moderated by senior investigators **Michael O'Donovan** (NINDS) and **R. Douglas Fields** (National Institute of Child Health and Human Development, NICHD). O'Donovan hopes that the SIG will bring people together who are studying diverse functions of glia in different areas of the nervous system.

Fields, a longtime supporter of glial research, thinks neuron-glia interactions have been neglected. "Glia were overlooked for a century, but now people realize the brain is an organ, not [made up of a] single [type of] cell," he said. "You need to understand all the cells." He described the importance of including glia in the BRAIN Initiative in an editorial entitled "Map the Other Brain" (*Nature* **501:**25–27, 2013).

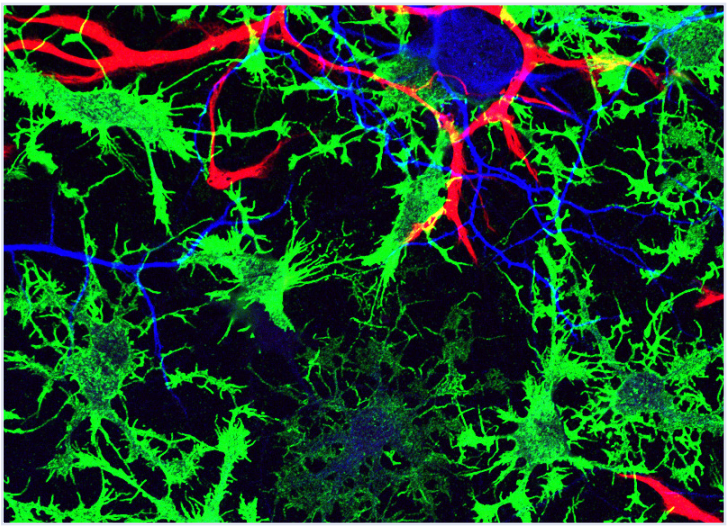
Interest in the NGI SIG has been overwhelming, with more than 120 scientists participating. In fact, intramural research into neuron-glia interactions is widespread, across NIH. Although many NIH researchers are conducting glial research, they don't all consider themselves glial biologists. The *NIH Catalyst* recently interviewed several of them. Excerpts of those interviews follow.

Herbert Geller, a senior investigator in the National Heart, Lung, and Blood Institute (NHLBI), has been studying glia since 1984. "Glial cells are key to sustenance," said Geller. Through glia, "neurons grow and survive…behave and misbehave." After spinal cord injury, astrocytes can form a glial scar and prevent regeneration of neurons. Geller's laboratory studies the role of chondroitin sulfate proteoglycans, a family of molecules produced by astrocytes contributing to the glial scar.

R. Douglas Fields, NICHD's chief of the Nervous System Development and Plasticity Section and editor-in-chief of the journal *Neuron Glia Biology,* also got excited about glia in the 1980s after a calcium-imaging experiment to look at neurons lit up non-neuronal cells as well. "It was a bewildering and exciting finding," recalled Fields. Eager to see whether Schwann cells also responded, he tested his hypothesis at NIH in building 49. "We were seeing neurons fire with our own eyes," he said. "The glial response was slow, but [glia] did respond." His research has focused on myelinating glia that change neuronal insulation with damage or pathology and may regulate functional activity like learning.

Senior investigator **Jau-Shyong Hong**, at the National Institute of Environmental Health Sciences (Research Triangle Park, N.C.), heads the Neuropharmacology Group and is interested in neuron-glia interactions. Over the past 15 years he has studied the mechanisms of inflammation-related progressive neurodegeneration in Parkinson and other diseases. "We realized that non-neuronal cells, such as microglia and astroglia, play critical roles in the pathogenesis of neurodegeneration," said Hong. He is trying to determine how microglia and astroglia communicate. He and other members of his lab join the SIG meetings remotely through videoconference.

"Microglia are quite interesting because they are dynamic," said NINDS senior investigator **Dorian McGavern**, chief of the Viral Immunology and Intravital Imaging Section. McGavern uses two-photon microscopy to compare microglia biology during a state of viral persistence or traumatic brain injury. We are "seeing



JONATHAN COHEN, FDA

Glia, non-neuronal cells once considered to be simply the "glue" holding neurons in place, play many important roles in the nervous system. Shown: confocal image of immature oligodendrocytes in a rat hippocampus (40x magnification).

dynamics, not just a snapshot in time, but [four-dimensional] imaging," said McGavern about the real-time tracking of microglia in a neuroprotective state after transcranial delivery of an antagonist. "Now we want to use an agonist to foster the 'jellyfish' reaction," a term he recently coined in a *Nature* publication to describe activated phagocytic microglia (*Nature* **505:**223–228, 2014).

Sohyun Ahn (NICHD) does not study glia directly, but instead investigates neural stem cells (NSCs), which express markers similar to those of glia and are even called radial glia during development. "We are interested in glial connections and the intrinsic NSC behavior," she explained. Her goal is to manipulate endogenous NSCs to produce cell types needed in disease models for therapeutic purposes.

Karlyne Reilly (National Cancer Institute) is researching two rare, incurable nervous-system tumors that arise from glial cells: astrocytomas in the central nervous system and malignant peripheral nerve-sheath tumors in the peripheral nervous system. "We mostly focused previously on genetic background," said Reilly. "We now want to look at mechanisms of tumor cells and the glial environment, specifically looking at the extracellular matrix." She joined the NGI SIG in hopes of expanding her research by "interacting with people [who] know normal glial processes." ●

• NGI SIG meetings, held on the first Tuesdays of the month at 2:00 p.m., are open to NIHers as well as to researchers in the Washingon, D.C. area. The meetings feature presentations by outside and NIH speakers as well as by students and postdocs. For more information, e-mail Amy Shafqat at amy.shafqat@nih.gov. To join the LISTSERV, send your request to neuron-glia@list.nih.gov.

• To read the BRAIN interim report, go to http://acd.od.nih.gov/presentations/BRAIN-Interim-Report.pdf).

Working Her Earrings Off

Senator Mikulski Returns to NIH

BY REBECCA G. BAKER, NIAID

United States Senator Barbara Mikulski (D-MD) addressed the "National Institutes of Hope" with love and pride on her February 24 visit, vowing to "do all we can do in the federal law book and the federal checkbook to let you be you" by ending the sequester and supporting the NIH.

ERNIE BRANSON

U.S. Senator Barbara Mikulski toured an NCI lab before addressing NIHers in Masur Auditorium. Mikulski, who's chair of the Senate Appropriations Committee, worked with the House Appropriations Committee to secure a bipartisan agreement to restore $1 billion in funding to NIH. From left, **Ramaprasad Srinivasan**, head of the Molecular Cancer Therapeutics Section in NCI's Urologic Oncology Branch, and Mikulski.

On her last visit in February 2013, Mikulski promised she would "work [her] earrings off" to ensure the NIH's mission would go forward with the federal government's support. This time, she was not wearing earrings.

We all know of the disappointments, sequester, and shutdown that intervened. But in January 2014, Mikulski, who's chair of the Senate Appropriations Committee, worked with House Appropriations Committee Chair Hal Rogers (R-KY) to secure a bipartisan agreement that provided NIH with a $1 billion budget increase over the post-sequester budget, allowing the NIH a sigh of relief.

The sequester cut the NIH budget by five percent; the 2013 shutdown lasted for 16 days, and 74 percent of NIH employees with "nonessential" status were furloughed. Even more sizable cuts were due to take place in the following years.

But Mikulski and her colleagues worked across party lines and set rules for crafting an agreement with civility, free of "funny stuff," and in-person rather than through the press. She worked with Senator Patty Murray (D-WA) and Representatives Chris Van Holland (D-MD) and Paul Ryan (R-WI) and others to craft a bipartisan agreement that cancelled the sequester for two years and restored $1 billion in NIH funding.

With her earrings gone, Mikulski vowed to work off extra calories in her efforts to fund the NIH for innovation in life sciences, to save lives, and to make it possible for scientists to get their research funded.

"NIH is the most well-known and the most revered institution in the federal government," Mikulski said. "You are beloved [because] you wake up thinking about…how to help people have opportunity and hope when they face medical situations." ●

The videocast for Senator Mikulski's visit can be viewed online at http://videocast.nih.gov/launch.asp?18293.

Recently Tenured

ALAN REMALEY, NHLBI

DAVID WENDLER, CC

ALAN REMALEY, M.D., PH.D., NHLBI

Senior Investigator and Chief, Lipoprotein Metabolism Section, Cardiovascular and Pulmonary Branch

Education: University of Pittsburgh, Pittsburgh (B.S. in biochemistry and chemistry); University of Pittsburgh School of Medicine (M.D.; Ph.D. in biochemistry)

Training: Residency in clinical pathology, University of Pennsylvania School of Medicine (Philadelphia); medical staff fellow and postdoctoral training in lipoprotein metabolism in NHLBI's Molecular Disease Branch

Came to NIH: In 1990 for training; in 1995 became senior staff member of the Clinical Center's (CC) Department of Laboratory Medicine and director of the CC's General Chemistry Laboratory

Selected professional activities: Captain in the United States Public Health Service

Outside interests: Running; mountain biking; kayaking

Research interests: Although cholesterol has a bad reputation and is associated with cardiovascular disease, it plays a vital role in normal cellular processes. My laboratory seeks to better understand lipoprotein metabolism and to translate new insights gained from basic biochemistry, cell biology, and transgenic animal models into much-needed clinical advances in the treatment and prevention of cardiovascular disease.

My laboratory has focused on the beneficial role of high-density lipoprotein (HDL), the so-called "good cholesterol." HDL, which is a complex of the protein apolipoprotein A-I (apoA-I) with phospholipids, removes excess cholesterol from peripheral tissues, such as the arterial wall, and transports it to the liver and intestine for excretion from the body. It has been shown that this process—the reverse cholesterol transport pathway—can be markedly stimulated by infusing HDL made with either purified or recombinant apoA-I and phospholipids. HDL infusion has been proposed as a therapy for patients with acute coronary syndrome who are at imminent risk for developing myocardial infarction.

We have developed small synthetic peptide mimetics of apoA-I; these peptides mobilize excess cholesterol from cells and have been shown to reduce atherosclerosis and inflammation in animal models. One of our peptides has been licensed to a company and is now undergoing preclinical toxicology studies for evaluation as a possible new therapy.

My collaborators and I are also investigating lecithin cholesterol acyltransferase (LCAT); two rare diseases result from a lack of LCAT. In a cooperative research and development agreement with an outside company, my laboratory has been instrumental in developing recombinant LCAT as a possible therapy, which is currently being tested at the NIH in early-stage clinical trials.

Another focus of my work is on the main cholesterol efflux transporter from cells, namely the ATP-binding cassette transporter 1 (ABCA1). Tangier disease, a rare genetic disorder characterized decades ago by **Donald S. Frederickson** at the NIH, involves a defect in the ABCA1 transporter and provided an early clue to the importance of the reverse cholesterol transport pathway. My laboratory is investigating how the ABCA1 transporter interacts with other intracellular proteins, as well as with extracellular cholesterol acceptor proteins during the cholesterol efflux process.

The opportunity to study and learn from patients at the NIH with rare genetic disorders of cholesterol metabolism often leads to new insights into common disease processes and inspires us to translate our basic science findings in cholesterol metabolism into new therapies for cardiovascular disease.

DAVID S. WENDLER, PH.D., CC

Head, Unit on Vulnerable Populations, Department of Bioethics

Education: University of Pennsylvania, Philadelphia (B.A. in biology and philosophy); University of Wisconsin at Madison (Ph.D. in philosophy)

Training: Fellowship, NIH Department of Bioethics; university fellow, Edmond J. Safra Center for Ethics, Harvard University (Cambridge, Mass.)

Came to NIH: In 1993 for training; in 1996, became head of the Unit on Vulnerable Populations

Selected professional activities: Associate editor, *Clinical Trials*; contributor, *Stanford Encyclopedia of Philosophy*

Outside interests: Traveling; wine tasting; reading fiction

Research interests: My current work focuses on the ethics of clinical care of and clinical research with individuals who are unable to give informed consent. The emphasis on respect for individual autonomy is important for competent adults, but poses a dilemma for treating and conducting research with incapacitated adults. My work has shown

that relying on surrogates places a significant burden on family members and often leads to decisions that are inconsistent with the patient's goals.

Based on these findings, my collaborators and I have begun to develop a new method for making treatment decisions that is designed to protect families, while better determining which treatment or research option is consistent with the patient's goals. In addition, I described a new justification for "nonbeneficial" pediatric research, which we used to develop the first systematic method to evaluate the risks of such research. This approach is intended to help investigators and review committees protect children without inadvertently blocking appropriate and valuable research.

I coordinate the Clinical Center's Ethics Grand Rounds and am an attending physician on the Bioethics Consult Service as well as a member of the Institutional Review Board for the National Institute on Drug Abuse. I have been a consultant for many organizations including the Health and Human Services Secretary's Advisory Committee on Human Research Protections, the World Medical Association, and the Council for International Organizations of Medical Sciences. ●

YOUR IDEAS WELCOME

We are always looking for ideas for stories about intramural researchers, behind-the-scenes activities that enable research to happen, new methods developed at NIH, and more. Don't hesitiate to get in touch. E-mail catalyst@nih.gov or call Managing Editor Laura Carter at 301-402-1449.

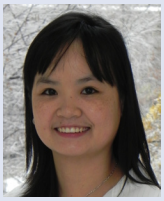
World Changers

Two NIHers Named to *Forbes* List of 30 Under 30

BY REBECCA G. BAKER, NIAID

GET READY, WORLD. NIH INTRAMURAL researchers are coming your way. *Forbes Magazine* compiles an annual list of 450 innovators under 30 years old—30 people in each of 15 categories—who are not waiting to make their mark. In 2014, two of the 30 promising young stars in the Science and Health Care category came from NIH's Intramural Research Program: **Anna Lau** and **Gregory Alushin**.

Fungal infections are difficult to diagnose and treat and are sometimes deadly, but the NIH Clinical Center's **Anna Lau** (who turns 30 in June) is up to the challenge. Even before becoming a staff scientist in the NIH Clinical Center, she played a role in developing diagnostic tests for fungal infections.

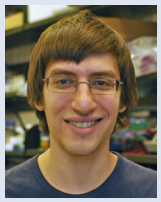


Her work has culminated in a new NIH database that may help doctors to more accurately identify fungi in patient blood using mass spectrometry. She is "thrilled to … see our NIH Mold Database shared with other clinical institutes worldwide, enabling rapid, simple, and accurate mold identification for patients infected with fungal disease." (*J Clin Microbiol* **51:**828–834, 2013)

Lau fell in love with microbiology at the University of Sydney (Camperdown, New South Wales, Australia), where she received a bachelor's degree in microbiology and a Ph.D. in medicine. She was "fascinated by this world of organisms that were invisible to the naked eye and were beneficial to humans but could cause destructive and devastating disease at the same time."

When she's not fighting microbes, Lau is gallivanting around the United States with family and friends on their visits from Australia, exploring new restaurants, and cooking at home.

Gregory Alushin (who turns 30 in July), in the National Heart, Lung, and Blood Institute (NHLBI), was also surprised and honored to be chosen by *Forbes*, particularly as a basic scientist. Simple curiosity had driven him into science and inspired him to load up on chemistry courses. He admits that at one point he considered a career in science writing and even ran a graduate-student popular-science magazine. But he ultimately decided that doing research was more exciting than writing about it.



As an undergraduate at Columbia University (New York), he studied the biophysics of how macromolecules interact. As a graduate student at the University of California, Berkeley, he used cryoelectron microscopy to link changes in microtubule shape with function (*Nature* **467:**805-10, 2010). He did postdoctoral work in NHLBI for a year and then, in 2013, received an NIH Early Independence Award, which enabled him to set up an independent lab. Now he's using cutting-edge electron- and light-microscopy techniques to study how cells use the cytoskeleton to sense and respond to the mechanical properties of their surroundings.

Outside the lab, Alushin loves climbing, spending time outdoors, and reading for pleasure: To acclimate to the nation's capitol, he is reading Robert Caro's biography of former president Lyndon Johnson (*The Path to Power: The Years of Lyndon Johnson*, New York: Knopf Doubleday Publishing Group, 1990), which he considers "a real-life version of [television's] *House of Cards*."

Imagine what more Anna Lau and Gregory Alushin will accomplish by the time they hit 40. ●

AWARDS

National Academy of Sciences: **Carolina Barillas-Mury** (NIAID), **Marius G. Clore** (NIDDK), and **Shiv I. Grewal** (NCI) were elected to the National Academy of Sciences, one of the highest honors a scientist can receive.

American Academy of Arts and Sciences: **Donald Lee Court** (NCI), **Thomas A. Kunkel** (NIEHS), and **Shiv I. Grewal** (NCI) were elected to the American Academy of Arts and Sciences in April 2014. Other notable members of the 2014 class include actor Alfredo "Al" Pacino and New York Philharmonic Orchestra Music Director Alan Gilbert.

"SEX DIFFERENCES IN NEUROSCIENCE"

WEDNESDAY, MAY 14, 2014
2:00–4:00 p.m.
Lipsett Amphitheater (Building 10)

As part of National Women's Health Week, May 11-17, the Office of Research on Women's Health (ORWH) will present a symposium to explore perspectives on the role of sex and gender in the brain and beyond. Featured speakers include: Story Landis (director, NINDS), Cheryl Bushnell (Wake Forest Baptist Stroke Center), and Margaret McCarthy (University of Maryland), and Janine Austin Clayton (director, ORWH). For more information, contact Leah Miller (leah.miller@nih.gov) or visit ORWH's Web site at http://www.nih.gov/women.

KUAN-TEH JEANG MEMORIAL LECTURE

"KSHV and MCV: Two Views on Virus-induced Cancer"
Thursday, May 15, 2014; Noon –1:00 p.m.
Lipsett Amphitheater (Building 10)
2:00 p.m.: Dedication of Jeang Memorial Garden between Buildings 31 and 6
Open to the public; no registration required

The featured speaker, Yuan Chang (University of Pittsburgh Cancer Institute), is the co-discoverer of Kaposi's sarcoma–associated herpesvirus (KSHV) and Merkel cell polyomavirus (MCV). For more information, contact Roland Owens (301-594-7471 or owensrol@mail.nih.gov). For more about Chang go to http://www.mvm.pitt.edu/node/275.

C. EVERETT KOOP MEMORIAL SYMPOSIUM ON WOMEN'S HEALTH RESEARCH

Friday, May 16, 2014, 8:00.–3:00 p.m.
Registration 7:30–8:00 a.m.
Masur Auditorium (Building 10)

The theme for this event, is "Empowering Women with Uniformed Service." This symposium, which honors the legacy of former U.S. Surgeon General C. Everett Koop and all who advance women's health research by serving in the Uniformed Services of the U.S. Government, features more than a dozen speakers, including Acting U.S. Surgeon General Rear Admiral Boris Lushniak. All are welcome. For more information: http://calendar.nih.gov/app/MCalInfoView.aspx?EvtID=28653

NINR DIRECTOR'S LECTURE WITH UCSF'S BARBARA DREW

"Electrocardiographic Monitoring: Two Decades of Discovery"
Tuesday, May 20, 2014, 10:30–11:30 a.m.
Natcher Conference Center, Balcony C

Barbara Drew (University of California, San Francisco), who founded the ECG Monitoring Research Lab at the UCSF School of Nursing, will discuss her research, which aims to improve cardiac-monitoring techniques and clinical practices in hospital and prehospital settings for more accurate diagnosis of cardiac arrhythmias, myocardial ischemia, and drug-induced long QT syndrome. The lecture will be videocast (http://videocast.nih.gov). For more information, visit http://www.ninr.nih.gov/directorslecture. For reasonable accommodation (sign language will be provided), e-mail info@ninr.nih.gov or call 301-594-8011.

WEDNESDAY AFTERNOON LECTURE SERIES

Wednesdays 3:00–4:00 p.m.
Masur Auditorium (Building 10)

May 14: *The Annual R. E. Dyer Lecture*: Akiko Iwasaki (Yale), "Antiviral Defense Mechanisms at the Mucosal Surfaces"

May 21: Ron Kahn (Harvard), "Interplay between Genes and Environment in Insulin Resistance and Metabolic Syndrome: The Unique Role of the Gut Microbiome"

May 28: Kaspar Locher (Eidgenössische Technische Hochschule Zürich), "ABC Transporters: Structures, Functions, and Reaction Mechanisms"

June 4: Karina Walters (U. of Washington), "Innovation of Methods and Measures of Historical Trauma and Micro Aggression"

June 11: *The Annual Marshall W. Nirenberg Lecture*: Karl Deisseroth (Stanford), "Optical Deconstruction of Fully-assembled Biological Systems"

June 18: Donald Ingber (Wyss Inst.; Harvard), "Human Organs on Chips and programmable Nanotherapeutics"

June 25: Jorge Galán (Yale), "Typhoid Toxin: A Window into the Unique Biology of *Salmonella typhi*"

For a complete WALS schedule, go to http://wals.od.nih.gov.

BUILD YOUR CAREER; SHAPE YOUR FUTURE: NIH CAREER SYMPOSIUM

May 16, 2014, 8:30 a.m.–5:00 p.m.
Natcher Conference Center (Building 45)
To register and for more information: http://www.training.nih.gov

The NIH Office of Intramural Training and Education invites all NIH graduate students and postdoctoral trainees, both basic scientists and clinicians, to participate in this symposium and learn about scientific career options and factors that lead to career success. The keynote speaker will be Gail Cassell, former vice president of Eli Lilly. Panel sessions cover academic, government, industry, and nonprofit career paths. More than 80 speakers will provide insights into their careers.

GRADUATE & PROFESSIONAL SCHOOL FAIR

Wednesday, July 16, 9:00 a.m.–3:00 p.m.
Exhibits: 10:00 a.m.–1:45 p.m.
Natcher Conference Center (Building 45)
Register at
https://www.training.nih.gov/gp_fair

The fair provides an opportunity for NIH summer interns (especially those in college) and postbacs, as well as other college students in the D.C. area, to explore educational pro-

grams leading to the Ph.D., M.D., D.D.S., M.D.–Ph.D., and other graduate and professional degrees. More than 150 outstanding colleges and universities from across the United States will send representatives from their graduate schools, medical and dental schools, schools of public health, and other biomedically relevant programs in the hopes of recruiting NIH trainees. The day will also include workshops on getting into graduate and professional school, M.D.–Ph.D. programs, interviewing, and careers in public health, psychology, and dentistry. A list of participating institutions can be found at the registration Web site.

LIPID MEDIATORS AND THE REGULATION OF INFLAMMATION AND DISEASE

Friday, May 30, 2014

Building 50, Large Conference Room

Register at http://ncifrederick.cancer.gov/events/LipidMediators2014/default.asp

The Cytokine Interest Group is sponsoring this daylong symposium. Speakers include Charles N. Serhan (Harvard Medical School), Edward A. Dennis (University of California, San Diego), Maziar Divangahi (McGill University), and Bruce D. Levy (Harvard Medical School). This meeting will also highlight intramural work; send abstracts for oral presentations to Katrin Mayer-Barber (mayerk@niaid.nih.gov) or Marta Catalfamo (catalfam@niaid.nih.gov).

TRANSDISCIPLINARY NIEHS POSTDOCTORAL POSITIONS AT NIEHS

Focus: Epigenetics or Stem-Cell Research

Applications due by the end of May

NIEHS, in Research Triangle Park, N.C., is seeking applicants for two new postdoctoral fellowship positions that provide training across scientific and administrative areas. Both positions will last up to five years. Trainees will gain extensive laboratory training in either epigenetics research or stem-cell research in the NIEHS Division of Intramural Research (DIR). DIR is also partnering with the Division of Extramural Research and Training and the Division of the National Toxicology Program to provide experience in grants administration, data analysis, environmental-health policy, and toxicology. Individuals will be mentored by faculty from each of the three divisions. Trainees at NIH are eligible to apply. Applicants should possess a Ph.D. in biology or chemistry, an M.D., or the equivalent, and have either graduate or postdoctoral experience in stem-cell or epigenetic research. For more information contact Rajendara S. Chhabra at chhabrar@niehs.nih.gov or 919-541-3386; or go to http://www.niehs.nih.gov/careers/research/.

2014 BENCH-TO-BEDSIDE AWARDS

Letters of Intent due June 18, 2014

The Bench-to-Bedside program is soliciting proposals for the FY2014 award cycle. Up to $135,000 per year for two years is available to support clinical-research intramural-extramural partnerships. All NIH intramural investigators are eligible to serve as project leaders on proposals that require a partnership between a basic and a clinical scientist. The proposals can involve only intramural investigators, but priority will be given to proposals with intramural and extramural partners. Extramural partners need to have an existing NIH grant, which will be supplemented for successful applications. Extramural investigators are also invited to initiate proposals and serve as project leaders with an intramural partner who will be responsible for coordination of proposal submissions. For more information visit http://www.cc.nih.gov/ccc/btb/awards.shtml or e-mail Benchto-Bedside@mail.nih.gov.

THE NIH VOLUNTARY LEAVE BANK: BECOME A 2014 MEMBER!

The Office of Human Resources is pleased to announce a second open enrollment for the NIH Voluntary Leave Bank. The Leave Bank is a pooled bank of donated annual and restored leave available to eligible members. It offers income protection and amounts to paid leave for members who have exhausted all their leave and are affected by a personal or family medical emergency or condition. The Leave Bank differs from the Voluntary Leave Transfer Program (VLTP) in that the bank is a depository of leave, and leave is distributed to members who are approved to be leave recipients; whereas the VLTP requires a direct donation from a donor to a recipient. An advantage of the Leave Bank is that eligible members may receive leave from the bank to cover time out of the office without awaiting donations. If you missed the first open enrollment, now is the final opportunity to become a 2014 member. Enrollment is open to all NIH federal employees. The open enrollment will run May 1–30. The membership period will begin June 29, 2014. To elect to become a member, access ITAS during the open enrollment and enroll under "Leave Bank Membership." The membership contribution is one pay period's worth of annual leave accrual. ITAS is available at https://itas.nih.gov. For more information, visit http://hr.od.nih.gov/benefits/leave/vlbp/default.htm. For questions, call or e-mail the NIH Leave Bank Office (301-443-8393 or LeaveBank@od.nih.gov).

NIH SUPPLY CENTER: MAKE IT YOUR FIRST CHOICE FOR SUPPLIES

The NIH Supply Center (NIH-SC), in Gaithersburg, Md., provides medical, laboratory, and general supplies to NIH, often at better prices than going directly to a vendor. Plus there are no state taxes; no delivery charges; and no minimum-order quantity or dollar limit; it often takes less time to order supplies than when using a government purchase card. Self-Service Store hours have changed for the two stores in Buildings 10 and 31: they are now open 9:00 a.m.–4:00 p.m. and remain open through lunch.

For questions, e-mail nihsupplycenter@od.nih.gov; call the customer service representative at 301-496-3517; or visit NIH-SC's Web site at https://nihsc.od.nih.gov.

Read more online at http://irp.nih.gov/catalyst/v22i3/announcements.

U.S. DEPARTMENT OF HEALTH AND
HUMAN SERVICES
National Institutes of Health
Building 1, Room 333
MSC 0183
Bethesda, Maryland 20892

FIRST-CLASS MAIL
POSTAGE & FEES PAID
DHHS/NIH
Permit No. G-802
Publication No. 14-6250

Official Business
Penalty for Private Use $300

Printed on at least 20% recycled content paper
and can be recycled as office white paper.

CATALYTIC REACTIONS?

If you have a photo or other graphic that reflects an aspect of life at NIH (including laboratory life) or a quotation or confession that scientists might appreciate and that would be fit to print in the space to the right, why not send it via e-mail: catalyst@nih.gov; fax: 301-402-4303; or mail: *The NIH Catalyst*, Building 1, Room 333.

Also, we welcome "letters to the editor" for publication and your reactions to anything on the *Catalyst* pages.

READ EXPANDED VERSIONS OF THE ARTICLES IN THIS ISSUE OF THE NIH CATALYST ONLINE AT
http://irp.nih.gov/catalyst/v22i3

PHOTOGRAPHIC MOMENT

The Dalai Lama Visits NIH

ERNIE BRANSON

The NIH Bethesda campus was buzzing with excitement on Friday, March 7: His Holiness the Dalai Lama was in town. After delivering a public talk at the National Cathedral (Washington, D.C.) that morning, he headed to NIH in the afternoon to tour the Clinical Center and then give the annual J. Edward Rall Cultural Lecture in the Kirschstein Auditorium (Building 45). Since the mid-1980s, the Dalai Lama has been interacting with modern scientists; his discussions have led to historic collaborations between Buddhist monks and world-renowned scientists and the introduction of modern science into the traditional curriculum of Tibetan monastic institutions. At NIH, he talked about "The Role of Science in Human Flourishing" to some 1,000 NIHers who had crowded into the auditorium. "I am extremely happy to visit this famous institution," he said. "Science is truly making contributions for well-being and care." After his remarks—which were punctuated often by his warm, infectious laugh—the Dalai Lama answered questions presented by NIH Director **Francis Collins** on behalf of employees. To watch a video of the lecture, including a video about Ed Rall, go to http://videocast.nih.gov/launch.asp?18316.

The NIH Catalyst is published bimonthly for and by the intramural scientists at NIH.

Address correspondence to:
Building 1, Room 333, NIH
Bethesda, MD 20892
Ph: 301-402-1449
Fax: 301-402-4303
e-mail: catalyst@nih.gov

The NIH Catalyst online:
http://irp.nih.gov/catalyst

PUBLISHER
MICHAEL GOTTESMAN
Deputy Director for Intramural Research, OD

EDITORS
JOHN I. GALLIN
Director, NIH Clinical Center
HENRY METZGER
Scientist Emeritus

MANAGING EDITOR
LAURA STEPHENSON CARTER

WRITER-EDITOR
CHRISTOPHER WANJEK
Director of Communications, OIR

COPY EDITOR
SHAUNA ROBERTS

CONTRIBUTING WRITERS
LYNN S. ADAMS
REBECCA G. BAKER
KRYSTEN CARRERA
JOHN DANIELS
MASHANA DAVIS
PATRICIA FORCINITO, WENDY KNOSP
RAY MACDOUGALL
NANCY MILLER
LYNNETTE NIEMAN
GERIANN PIAZZA
RACHEL SCHEINERT
SANDHYA XIRASAGAR

PHOTOGRAPHERS/ILLUSTRATORS
M. BARTLETT, B. BRANSON, E. BRANSON, C. BUCKNER, J. COHEN, F. KUTLAK, M. VANELLA

EDITORIAL ADVISORY BOARD
CHRISTINA ANNUNZIATA, NCI
DAN APPELLA, NIDDK
DAVID DAVIES, NIDDK
LESLEY EARL, NCI (FELLOW)
MICHAEL ESPEY, NIDDK
SUSAN LEITMAN, CC
GERMAINE BUCK LOUIS, NICHD
DAVID MILLER, NIEHS
BERNARD MOSS, NIAID
HYUN PARK, NCI
PAUL PLOTZ, NIAMS
JULIE SEGRE, NHGRI
ANDY SINGLETON, NIA
GISELA STORZ, NICHD
RONALD SUMMERS, CC
RICHARD WYATT, OIR