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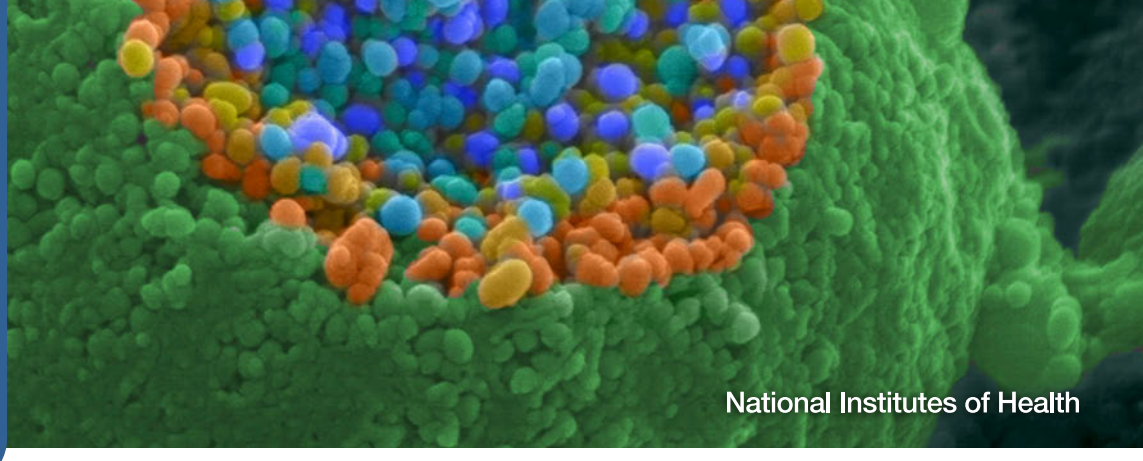


National Institutes of Health

AN INVITING ECOSYSTEM

America Is a Nation of Makers, Says HHS's Fox

BY ERIC BOCK

Susannah Fox, HHS chief technology officer, sees herself as a lookout sitting in a crow's nest. Perched high atop a ship's mast, the lookout's job is to alert the crew down below to both hazards and opportunities on the horizon.

"The opportunity that I see in the current landscape is in manufacturing—the ability to prototype, test and share designs for medical and assistive devices at lower costs and on a faster timeline than we've ever imagined," she said at the recent "Making Health: Inspiring Innovative Solutions for Research and Clinical Care" symposium in Masur Auditorium.

Susannah Fox, HHS chief technology officer, addresses a recent National Week of Making assembly in Masur Auditorium.

Fox presented the keynote address at the event, which also featured a panel discussion and five presentations from scientists who are using new technologies such as 3-D printing to improve health care.

From Dr. John Gibbon, who built the first heart-lung machine on his kitchen table, to Alaskan natives who can fix a plane or a boat with only duct tape and wire, the United States is a nation of makers, Fox said.

She called NIH a "shining beacon of creative confidence. This campus is full of people who look at a problem and say, 'Let's go, let's solve this!'"

Fox encouraged the government to make it easier for the public to share their inventions with the government. For example, scientists could consult with experts who don't technically have authority. In the health care setting, patients and caregivers are examples of those without authority.

"Our goal should be to create a movement or an ecosystem that is so inviting that lots of people want to contribute to it—even if they don't work for us," Fox said. "That's the best and highest pursuit of science."

In 2013, HHS created the Innovation,

SEE **MAKERS**, PAGE 4

Fire on the mountain; see story on p. 2.

ALSO THIS ISSUE

'Co-Robots' Capture Congressional Attention

BY SAARAA FAROOQ

Three NIH-funded co-robots caught the eyes and interest of Capitol Hill staffers at a National Robotics Initiative (NRI) briefing: a co-robotic cane for the visually impaired, a brain-controlled exoskeleton for stroke victims and a mechanized exoskeleton that helps people paralyzed from the waist down walk.

Dr. Cang Ye demos his NEI-funded co-robotic cane, featuring speech interface, 3-D camera and motorized roller tip.

Coordinated by the Congressional Robotics Caucus and co-hosted by Reps. Rob Woodall (R-GA) and

SEE **ROBOTICS**, PAGE 6

Fitness instructor Susan Grant, who teaches several group fitness classes at NIH, gets everyone moving at a Pilates session.

Expo Promotes Safer, Healthier Living

BY DANA TALESNIK

Are you sitting ergonomically at your desk? Know the difference between heat exhaustion and heat stroke? Thinking about ways to get in better shape? NIH'ers got answers to these questions among the many other helpful tips and fun activities they enjoyed at

SEE **WELLNESS**, PAGE 8

PHOTO: THE CONVERSATION PROJECT

Goodman To Present NINR Lecture, Sept. 13

On Tuesday, Sept. 13, Ellen Goodman will present the 2016 NINR Science and the Public Lecture from 10:30 to 11:30 a.m. in Lipsett Amphitheater, Bldg. 10. In her talk "The Most Important Conversation We're Not Having," she will describe the Conversation Project, a public health campaign and movement that works to change the way people talk about and prepare for their end-of-life care.

Goodman has spent most of her life chronicling social change and its impact on American life. She was one of the first women to write for the op-ed pages where she became, according to Media Watch, the most widely syndicated progressive columnist in the country. In 1980, she won the Pulitzer Prize for Distinguished Commentary. In 2012, Goodman founded the Conversation Project, which is dedicated to helping people talk about their wishes for end-of-life care. The project has the goal of changing our nation's culture so that everyone's wishes for end-of-life care are both expressed and respected.

The Science and the Public Lecture is the first in a series designed to highlight issues of relevance to the broader public. There will be a reception following the lecture, made possible by the Foundation for the National Institutes of Health. For more information and to register, visit www.ninr.nih.gov/directorslecture.

Register for the 33rd NIH Institute Relay, Sept. 22

The 33rd NIH Institute Challenge Relay will be held on Thursday, Sept. 22 in front of Bldg. 1, beginning at 11:30 a.m. The NIH Recreation and Welfare Association, members of the original NIH Health's Angels running club and the ORS Division of Amenities and Transportation Services invite you to this year's event.

The relay consists of teams of five runners, each of whom runs a half-mile loop around Bldg. 1. All institutes, centers, divisions and contractors are invited to enter as many teams as they wish. Each team must have men and women runners with at least two runners of the same sex. The fastest team will have their names engraved on the Allen Lewis NIH Memorial Trophy located at the Bldg. 31 Fitness Center.

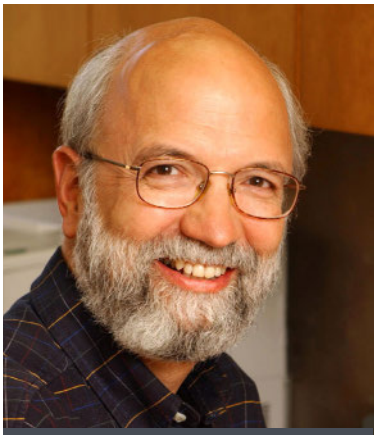
This year, registration will be done online at https://www.fedesp.com/nih/events/the-nih-institute-relay-2016/ and the fee is $15 per team. Each group leader is asked to provide the name and contact information for one volunteer; there need to be 26 volunteers for each of two heats for the relay to commence. Be sure to visit food vendors and event exhibitors as well. To volunteer or for more information, call the R&W office at (301) 496-6061.

Montana Forest Fire Affects RML

A forest fire erupted on the afternoon of July 31 in the Bitterroot Mountains, about 5 miles southwest of NIAID's Rocky Mountain Laboratories in Montana. As shown in the photo taken by local Office of Research Facilities staff, the firestorm appeared to hover over the RML Integrated Research Facility. The blaze forced 24 RML staff to evacuate their homes for nearly a week and destroyed one employee's home. In all, more than 800 residents were evacuated; 16 homes burned, as did 49 sheds, barns and garages. The fire did not threaten RML structures, but prompted employees to revisit procedures and protocols for emergency situations. RML leadership effectively used an incident command structure to keep its 450 staffers informed of fire developments, smoke mitigation and fire evacuation plans and personnel leave options. The NIH Recreation and Welfare Association branch at RML raised about $2,700 for the 10 local volunteer fire departments that responded to the fire. The organization coordinated about 40 RML volunteers to assist co-workers with evacuation needs.

PHOTO: BRYAN KERCHER

Vote Now



Dr. Allen Wilcox's research has led to discoveries of environmental factors that affect birth defects, fundamental advances in understanding miscarriage and improved methods for studying fertility.

PHOTO: STEVE MCCAW

NIEHS's Wilcox a 'Sammies' Finalist

NIEHS epidemiologist Dr. Allen Wilcox is a finalist for one of the Samuel J. Heyman Service to America Medals, or Sammies. This is the second year that the Partnership for Public Service is adding a People's Choice Award to the eight awards that will be chosen by the official selection committee.

Anyone with a Facebook account may vote once a day, between now and Sept. 9.

The organization's web site featured a story on Wilcox's achievements throughout his career as a groundbreaking researcher in the epidemiologic study of human reproduction.

You may support Wilcox by visiting the People's Choice Award page (http://servicetoamericamedals.org/peoples-choice/) and voting once a day and by sharing the news with colleagues and friends.

Winners will be announced Sept. 20 at a gala celebration.

Columbia's Gordon Named NIMH Director

Dr. Joshua A. Gordon has been named director of the National Institute of Mental Health. He is expected to join NIH next month.

"Josh is a visionary psychiatrist and neuroscientist with deep experience in mental health research and practice," said NIH director Dr. Francis Collins, who made the appointment. "He is exceptionally well qualified to lead the NIMH research agenda to improve mental health and treatments for mental illnesses. We're thrilled to have him join the NIH leadership team."

Gordon will oversee the lead federal agency for research on mental illnesses. With an annual budget of approximately $1.5 billion, NIMH supports more than 2,000 research grants and contracts at universities and other institutions across the country and overseas. In addition, the NIMH intramural research program supports some 300 scientists working on the NIH campuses.

Gordon joins NIH from New York City, where he serves as associate professor of psychiatry at Columbia University Medical Center and research psychiatrist at the New York State Psychiatric Institute.

In addition to his research, Gordon is an associate director of the Columbia University/New York State Psychiatric Institute Adult Psychiatry Residency Program, where he directs the neuroscience curriculum and administers the research programs for residents.

Joining the Columbia faculty in 2004, Gordon has focused on the analysis of neural activity in mice carrying mutations of relevance to psychiatric disease.

The lab studies genetic models of these diseases from an integrative neuroscience perspective and across multiple levels of analysis, focused on understanding how a given disease mutation leads to a particular behavior. The lab employs a range of neuroscience techniques including neurophysiology, which is the study of activity patterns in the brain, and optogenetics, which is the use of light to control neural activity.

His work has direct relevance to schizophrenia, anxiety disorders and depression

Dr. Joshua A. Gordon starts next month as director of NIMH.

and has been funded by grants from NIMH and other research organizations. Gordon maintains a general psychiatric practice, caring for patients who suffer from the illnesses he studies in his lab.

He pursued a combined M.D./Ph.D. degree at the University of California, San Francisco. Medical school coursework in psychiatry and neuroscience convinced him that the greatest need, and greatest promise, for biomedical science was in these areas. During his Ph.D. thesis, Gordon pioneered the methods necessary to study brain plasticity in the mouse visual system. Upon completion of the dual degree program at UCSF, he went to Columbia for his psychiatry residency and research fellowship.

• • •

"Josh is a visionary psychiatrist and neuroscientist with deep experience in mental health research and practice."

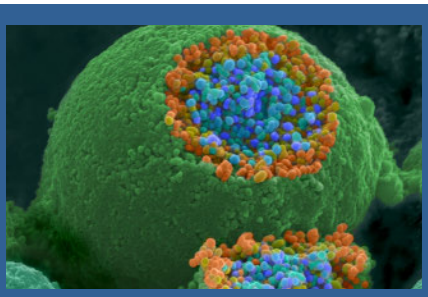
-DR. FRANCIS COLLINS

• • •

Gordon has been a member of the Hope for Depression Research Foundation's depression task force since 2012, where he works collaboratively with this international group to define the neurobiology underlying depression and identify novel treatment targets.

His work has been recognized by several awards, including the Brain and Behavior Research Foundation–NARSAD Young Investigator Award, Rising Star Award from the International Mental Health Research Organization, A.E. Bennett Research Award from the Society of Biological Psychiatry and Daniel H. Efron Research Award from the American College of Neuropsychopharmacology.

"I want to recognize and thank NIMH acting director Dr. Bruce Cuthbert for his exemplary leadership of the NIMH over the past several months," added Collins.



ON THE COVER: *A scanning electron microscope picture of a nerve ending broken open to reveal vesicles (orange and blue) containing chemicals to pass messages in the nervous system.*

IMAGE: TINA CARVALHO, UNIVERSITY OF HAWAII, MANOA

The NIH Record

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National Institutes of Health
Turning Discovery Into Health

Dr. Maria Jaime of NIDDK's Oliver Lab describes the WAFFL, a 96-well system she designed for housing and feeding 96 fruit flies.

Makers

CONTINUED FROM PAGE 1

Design, Entrepreneurship and Action (IDEA) Lab to help meet this goal. The lab's mission is to promote "the use of innovation across HHS to better enhance and protect the health and well-being of the public." The lab emphasizes internal innovation, short-term tours of duty and sponsors conferences and prize competitions to spur innovation.

Fox concluded by urging the audience to tinker, experiment, share prototypes and "find ways to incentivize the maker movement spirit."

After the symposium, visitors get a look at 3-D models and inventions made at NIH on display at the NIH Library.

PHOTOS: ERNIE BRANSON

★ ★ ★

NIH is a "shining beacon of creative confidence. This campus is full of people who look at a problem and say, 'Let's go, let's solve this!'"

–SUSANNAH FOX

★ ★ ★

After her keynote, four NIH scientists and one from Walter Reed National Military Medical Center gave presentations about their efforts to improve health care in the federal government.

The first presenter, George Dold of NIMH's section on instrumentation, described how technologies such as 3-D printing allow researchers to become inventors. Scientists can explain what they want and then Dold can work with them to create devices and instruments.

Dr. Paige Derr, lead scientist of the tissue printing group at NCATS, described her work printing living human skin and retina tissue for use in the drug discovery process.

Dr. Maria Jaime of NIDDK's Oliver Lab explained how she designed the Whole Animal Feeding Flat (WAFFL), a 96-well system for housing and feeding 96 fruit flies. Before she built the WAFFL, feeding flies with different treatments was a labor-intensive process.

"I found it very challenging to work with flies and drug treatments, so I started thinking, 'How can I simplify my life?'" Jaime said. From there, she drew up a prototype, made it using a 3-D printer and then refined the design. The WAFFL allows her to feed the flies with different drug treatments faster than ever, using very small volumes of liquid food.

Dr. Stefan Jaeger, a research fellow at NLM's Lister Hill Center for Biomedical Communications, spoke about his efforts to develop a smartphone app that detects malaria. The disease is a severe public health problem in tropical and subtropical parts of world. The app uses automatic image analysis software to accurately count how many malaria parasites there are in a sample of blood. It runs on a smartphone that attaches to a microscope.

Finally, Dr. Peter Liacouras, director of services at Walter Reed's 3-D Medical Applications Center, said that, since 2003, the service has 3-D printed more than 7,000 anatomical models reconstructed from radiographic images for the Department of Defense and the Department of Veterans Affairs. In addition, the center has manufactured more than 300 custom cranial implants for Walter Reed. The anatomical models can help guide doctors before they perform surgery and give them a sense that they've been there before.

"We do whatever providers want us to do," he said. "We don't like to say no."

After the presentations, Fox moderated a panel discussion. Asked what advice the presenters would give to those looking to take advantage of the maker movement, the panelists offered these tips: don't discount ideas, acknowledge your limitations, don't get frustrated when things don't go according to plan and use every available resource—including colleagues.

The symposium was part of the White House's National Week of Making.

Fox (r) moderates a panel discussion on innovation and invention.

The NIH CC Take Me There app, available in English and Spanish, allows users to follow turn-by-turn directions inside the hospital. Download it for free in Apple's App Store and the Google Play Store.

Navigation App Makes Getting Around CC Easier

BY ERIC BOCK

With 13,841 rooms and more than 13 miles of hallways, the Clinical Center invites getting lost. Now, however, a new and free navigational app will make getting around the hospital easier than ever.

The NIH CC Take Me There app allows users to follow turn-by-turn directions inside the hospital. It also features a directory that includes important information about the hospital. A web version is also available for those who don't own a smartphone or tablet.

"This initiative can aid safety, operational efficiency and improve patients' and visitors' overall experience," said CC director Dr. John Gallin. "The House of Hope, as we're known, has a big heart, but it's a big place, too. We're pleased to respond to the wishes of patients, visitors and the NIH community to make the hospital easier to navigate."

The app relies on Bluetooth low-energy beacons, said Eric Cole, chief of the Clinical Center's Office of Administrative Management. The beacons emit a signal that's picked up by a smartphone or tablet as long as Bluetooth is enabled on the device.

There are 855 beacons spaced roughly every 25-30 yards throughout common areas and hallways in the hospital, he said. The app's accuracy is within 7-10 feet (2-3 meters).

The app combines indoor navigation with outdoor GPS navigation, Cole noted. For example, patients can open the app at home and enter their destination at the CC. If the patient is driving to campus, the app will direct him or her to parking reserved for patients. Once the car is parked, the app will save the location of the vehicle.

From there, the app seamlessly switches from outdoor to indoor navigation. If the patient misses a turn, the app automatically reroutes him or her. If a patient passes a laboratory that isn't open to the public, a beacon activates an alert on the app that lets the user know he or she is near a staff-only lab. Once patients get to their destination, they will be able to provide feedback.

"We wanted to mimic the look and feel of a GPS system found in people's cars," Cole said. "The app also has turn-by-turn voice navigation that can be muted."

The app does more than just get users to their destination, said Maria Maslennikov of the CC's Office of Communications and Media Relations. She helped develop the app, which also features a staff directory that's updated every 2 weeks and a real-time shuttle bus schedule.

The app also includes information about places of interest both on and off-campus. Patients and visitors can, for example, use the app to find the nearest mailbox, ATM, restroom in the CC or a restaurant in downtown Bethesda, she noted. Another feature gives users an opportunity to alert the CC's housekeeping staff to areas of the hospital that need to be cleaned.

Maslennikov credited clinical research nurse Eva Sarbah-Yalley with suggesting the app's name—"NIH CC Take Me There."

Cole said development of the app began about a year ago, after the NIH advisory board for clinical research suggested that the CC determine whether new technologies could help patients and staff who had a difficult time getting around the hospital.

Already, he said, several hospitals interested in creating their own wayfinding apps have asked about the CC's experiences.

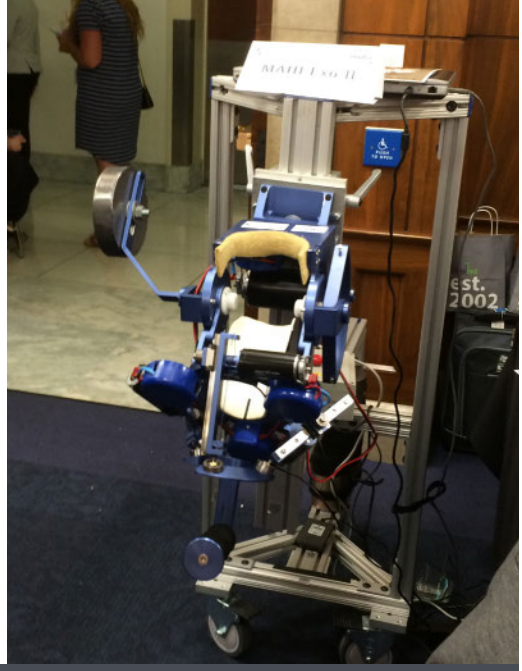
"We're very proud to have built a useful resource for patients, visitors and staff," said Cole.

The NIH CC Take Me There app is available in English and Spanish and can be downloaded for free in Apple's App Store and the Google Play Store.

NCI Office Supports Children's Inn with Dinner, Donations

On June 29, members of NCI's Office of Grants Administration (above) hosted a Family Dinner Night at the Children's Inn at NIH. The theme was the 4th of July. "It was well appreciated, a huge success and great fun," said Dianna Bailey, a grants management specialist. Other OGA activities for the inn have included a donation drive to offset the cost of household goods, personal care items, water and gift cards. At right is a photo of goods presented to the inn last December after an OGA drive.





From health-focused exoskeletons to modular snakes. At the 2016 National Robotics Initiative briefing, participants (from l) Simon Kalouche and Alexander Ansari (Carnegie Mellon University) and Ryan Reese (Ekso Bionics) demonstrate their co-robots. At center, Rep. Randy Hultgren (R-IL) with Reese, a former Navy senior chief petty officer. Although paralyzed from the waist down, Reese can stand and walk with the help of a co-robotic exoskeleton. At right is the MAHI EXO-II.

PHOTOS: JOE BALINTFY, SAARAA FAROOQ

Robotics

CONTINUED FROM PAGE 1

Mike Doyle (D-PA), the recent event at the Rayburn House Office Bldg. marked the fifth anniversary of the NRI.

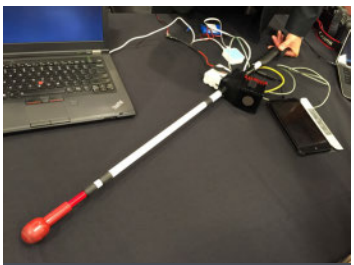
The NRI is a multi-agency research initiative that supports the development of next-generation robotics technology. Co-robots are robots that work cooperatively with people. "The focus is on applications in which robots work with or beside people to extend or augment human capabilities and make the most of each other's strengths," said Doyle.

The NRI is coordinated by the White House Office of Science and Technology Policy. Institutes taking part include NIBIB, NEI, NIA, NICHD, NIDCD, NINDS, NINR and OBSSR.

Robo-Cane Helps People with Vision Loss

Dr. Cang Ye of the University of Arkansas at Little Rock developed a co-robotic cane to help people with vision loss get from one place to another and avoid obstacles. The cane works through an intuitive interface, helping navigate using positioning, wayfinding, object recognition and obstacle detection.

The cane's 3-D camera and computerized system detects and recognizes indoor structures and potential obstacles, communicating with the user through voice prompts. "It will analyze 3-D information and tell you if, for example, it's a hallway, a stairway or a doorway," Ye explained. The robo-cane's roller tip is motorized and can point toward the desired destination.


Robo-cane

Development of the co-robotic cane is funded by NEI and NIBIB. "Directing new technologies toward assistive devices such as the co-robotic cane has the potential to improve the mobility and independence of people with vision loss," said Dr. Cheri Wiggs, NEI program director for low vision and blindness rehabilitation.

Robotic Rehab for Stroke Patients' Arms

Dr. Marcia K. O'Malley of Rice University is developing the MAHI EXO-II exoskeleton robot to help heal stroke patients' affected arms. "Once you've lost the electrical connections in the brain because of the damage from the stroke, you've got to find a detour around the damage," she said.

O'Malley explained that the combination of thinking about movement during robot-assisted movement stimulates remapping of nerve pathways in the brain. While wearing a non-invasive cap that reads electrical activity of the brain, patients imagine moving their arm. "We're using that to command the robot to do the movement," she said.

The MAHI EXO-II is funded by NINDS.

Exoskeleton Suit Helps People Walk

A mechanized exoskeleton suit, developed with NIBIB funding, enables people paralyzed from the waist down to walk. The exoskeleton stimulates damaged spinal cord nerves with electrical signals, helping patients regain voluntary movement.

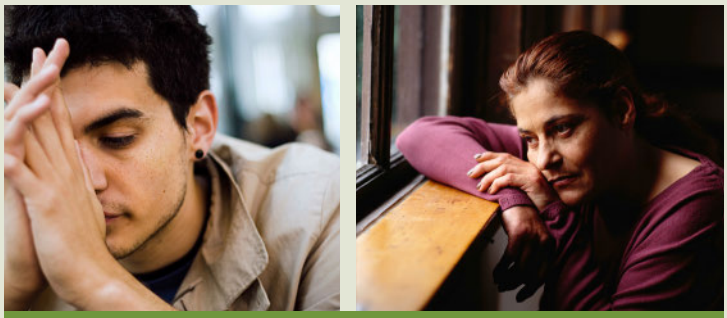
Developed over the past decade, the exoskeleton suit, called the Ekso GT, is manufactured and sold by Ekso Bionics. It is the first exoskeleton approved by the FDA for use with stroke and spinal cord injuries below the seventh cervical vertebra.

Anniversary Features Federal Partnerships

"The Congressional Robotics Caucus event was a great opportunity for the community to engage with national leaders," said Dr. Michael Wolfson, director of the NIBIB program in implantable and assistive devices. "The room was filled to capacity with members of Congress, staffers, technology developers and federal stakeholders, all participating in a lively panel discussion and engaging with assistive robot demonstrations."

"Each agency can look at its own mission and at the same time put the best effort into collaborating with other federal agencies to achieve the NRI's goal of accelerating the development and use of robots that work beside or cooperatively with people," said Dr. Daofen Chen, a program director at NINDS.

For more information about the projects and NRI, visit www.roboticscaucus.org/.



Scientists discovered 15 genome sites—the first ever—linked to depression.

Tapping Crowd-Sourced Data Unearths Trove of Depression Genes

Scientists have discovered 15 genome sites—the first ever—linked to depression in people of European ancestry. Many of these regions of depression-linked genetic variation turn out to be involved in regulating gene expression and the birth of new neurons in the developing brain.

But, in a twist, the researchers didn't have to sequence anyone's genes. Instead, they analyzed data already shared by people who had purchased their own genetic profiles via an online service and elected to participate in its research option. This made it possible to leverage the statistical power of a huge sample size to detect weak genetic signals associated with a diagnosis likely traceable to multiple underlying illness processes.

This novel use of crowd-sourced data was confirmed with results from traditional genetics approaches in the study, funded by NIH.

Dr. Roy Perlis of Harvard/Massachusetts General Hospital, a grantee of NIMH and NHGRI, and colleagues from industry reported on their findings Aug. 1 in the journal *Nature Genetics*.

It's well known that at least some depression runs in families and some risk is inherited. Yet, prior to this study, conventional genome-wide approaches had failed to reliably identify chromosomal sites associated with the illness in populations with European roots. Since depression is thought to be like fever—a common set of symptoms likely rooted in multiple causes—lumping together genetic data from people with different underlying illness processes likely washed out, or statistically diluted, subtle evidence of effects caused by risk genes.

To increase their odds of detecting these weak genetic signals, the researchers adopted a strategy of studying much larger samples than had been used in the earlier genome-wide studies. They first analyzed common genetic variation in 75,607 people of European ancestry who self-reported being diagnosed or treated for depression and 231,747 healthy controls of similar ethnicity. These data had been shared by people who purchased their own genetic profiles via the 23 and Me web site and agreed to participate in the company's optional research initiative, which makes data available to the scientific community while protecting privacy.

Study Supports Surgery for Myasthenia Gravis

In a global study of myasthenia gravis, an autoimmune disease that causes muscle weakness and fatigue, researchers found that surgical removal of an organ called the thymus reduced patients' weakness and their need for immunosuppressive drugs. The study, published in the *New England Journal of Medicine*, was partially funded by NIH.

"Our results support the idea that thymectomy is a valid treatment option for a major form of myasthenia gravis," said a leader of the study, Dr. Gil Wolfe of Jacobs School of Medicine and Biomedical Sciences at the University at Buffalo, New York.

The Thymectomy Trial in Non-Thymomatous Myasthenia Gravis Patients Receiving Prednisone was a randomized, controlled study conducted on 126 patients ages 18-65 between 2006 and 2012. The researchers compared the combination of surgery and immunosuppression with the drug prednisone with prednisone treatment alone. They performed extended transsternal thymectomies on 57 patients. This major surgical procedure aims to remove most of the thymus, which requires opening of a patient's chest.

On average, the researchers found that the combination of surgery and prednisone treatment reduced overall muscle weakness more than prednisone treatment alone.

The researchers also found that patients who had surgery required lower daily doses of prednisone than the patients receiving prednisone alone. They had less need for additional immunosuppressant drugs as well.

"This is a study that the myasthenia gravis community has needed for a long time," said Dr. Robin Conwit, NINDS program director. "We hope it becomes a model for rigorously testing other treatment options."

NIH Begins Testing Investigational Zika Vaccine in Humans

NIAID recently launched a clinical trial of a vaccine candidate intended to prevent Zika virus infection.

PHOTO: NIAID

NIAID has launched a clinical trial of a vaccine candidate intended to prevent Zika virus infection. The early stage study will evaluate the experimental vaccine's safety and ability to generate an immune system response in participants. At least 80 healthy volunteers ages 18-35 years at 3 study sites in the United States, including the Clinical Center, are expected to participate in the trial. Scientists at NIAID's Vaccine Research Center developed the investigational vaccine—called the NIAID Zika virus investigational DNA vaccine—earlier this year.

The study is part of the U.S. government response to the ongoing outbreak of Zika virus in the Americas. According to the Centers for Disease Control and Prevention, more than 50 countries and territories have active Zika virus transmission. In the U.S. and its territories, more than 6,400 Zika cases have been reported.

Although Zika infections are usually asymptomatic, some people experience mild illness lasting about a week. However, Zika virus infection during pregnancy can cause a serious birth defect called microcephaly, as well as other severe fetal defects of the brain and other organs. There are no vaccines or specific therapeutics to prevent or treat Zika virus disease.

The NIAID Zika virus investigational DNA vaccine approach is similar to that used for another investigational vaccine developed by NIAID for West Nile virus. That vaccine candidate was found to be safe and induced an immune response when tested in a phase 1 clinical trial.

The investigational Zika vaccine includes a small, circular piece of DNA—called a plasmid—that scientists engineered to contain genes that code for proteins of the Zika virus. When the vaccine is injected into the arm muscle, cells read the genes and make Zika virus proteins, which self-assemble into virus-like particles. The body mounts an immune response to these particles, including neutralizing antibodies and T cells. DNA vaccines do not contain infectious material—so they cannot cause a vaccinated individual to become infected with Zika—and have been shown to be safe in previous clinical trials for other diseases.

At left, attendees sample farro salad and other edibles courtesy of Eurest Dining Services in the CC's south lobby. At right, staff talk with a representative from Miss Utility, which marks pipes and utility lines before homeowner digging projects, at one of many safety information tables.

Wellness

CONTINUED FROM PAGE 1

the 5th annual Safety, Health & Wellness Day held recently.

The expo, held in previous years in Natcher Bldg. in August, featured info tents outside the Clinical Center's south entrance, food trucks and farmer's market vendors, more health-related exhibits just inside and fitness classes in the FAES classrooms. ORS and co-sponsors moved the location and date to increase visibility and participation.

"This was an opportunity for employees to see, know and understand services that are here for them to support their overall health, safety and well-being," said Chris Gaines, program manager for NIH fitness and wellness services. "There are so many great services here and, in many cases, they're free of charge."

Some stopped by for a free chair massage, provided by local massage therapists. Some came for health and fitness screenings or to try out a free fitness class, from Zumba to yoga to piloxing (a combination of Pilates, boxing and dance), led by NIH Fitness Center instructors.

"Remember, your first gym session is free so try out classes or the machines and see what you like before you join," said Gaines.

Those who stopped by exhibit tables learned ways to stay safe at work and at home. ORS's Division of Occupational Health and Safety (DOHS) offered information on environmental, chemical, electrical and fire safety. For instance, did you know you're supposed to replace all smoke alarms when they're 10 years old? A new Maryland law also requires replacing any battery-only smoke alarms with ones powered by sealed-in, 10-year, long-life batteries.

Concerned about air quality in your office? If you smell a potentially toxic chemical, you'd call the campus fire department. But for general occupational health and safety concerns, each IC has an assigned specialist, who can be found through DOHS's Safety Operations and Support

An attendee tries out a massage chair.

PHOTOS: ERNIE BRANSON

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"This was an opportunity for employees to see, know and understand services that are here for them to support their overall health, safety and well-being."

-CHRIS GAINES

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Branch. NIH safety specialists showed off gadgets they use to check humidity, temperature and air quality.

At one DOHS table, many recoiled at the sight of a vial of bedbugs, and were surprised to learn their actual size is just 3/16th of an inch. NIH's Integrated Pest Management staff explained how to spot these miniscule critters and prevent them from becoming your traveling companions. Also offering warnings about insects was NIAID, distributing information about ways to protect against mosquito bites and Zika virus.

Addressing personal safety, campus police emphasized awareness and common sense.

"Know your neighbors, at work and at home," advised Cpl. John Coe, "and be aware of people in your immediate surroundings. If someone comes along who nobody recognizes, who looks out of place, call the police. Don't get involved in the situation. Don't chase or confront anybody. Get a good description of the suspicious person and police will respond."

Coe also offered a common sense summertime tip: "In hot weather, some people [wanting to keep the air conditioning going] leave their car running while they run into the store," he said. "First of all, that's illegal in Maryland. And second, if your car gets stolen, insurance won't replace it. It's the little things; have street sense."

The National Weather Service disseminated information about staying safe in severe weather and riptides and how to detect heat stroke.

Both heat exhaustion and heat stroke can cause nausea, but heat stroke does not cause sweating; rather, the person may have a throbbing headache, a rapid and strong pulse, red, hot skin and may lose consciousness. If you suspect someone has heat stroke, call 911 and take immediate action to cool the person until help arrives.

And about improving ergonomics at your desk? DOHS's Occupational Medical Service says monitors should be placed no more than an arm's length in front of you and suggests putting a support, such as a rolled-up towel, behind your lower back to prevent slouching.

To learn more about NIH's many resources for employees, visit the Amenities and Health & Safety tabs at www.ors.od.nih.gov.

FACING CRITICAL ILLNESS

Lecture Explores Family Decision-Making at End of Life

Dr. Marie Nolan recently presented the second of this year's four NINR Director's Lectures. Her talk, "Reframing Shared Decision-Making at the End of Life," detailed her research on patient and family decision-making in the face of critical illness.

Nolan's preliminary work revealed that many patients with terminal illness wanted to share decision-making about treatments with family members, even when the patients had the capacity to make their own decisions. Also, in contrast with the view that advance care planning should focus more on patients' autonomy and preferences for specific treatments, Nolan's team found that many patients—if they were to become unconscious—preferred that their physician rely on their family members' judgements about what would be best for them rather than their own stated preferences for specific treatments. Given these insights, Nolan and her team decided to focus on how patients wanted their decisions made at the end of life.

Dr. Marie Nolan (l) accepts plaque from NINR director Dr. Patricia Grady.

One of her first studies examined patients with cancer, heart failure and amyotrophic lateral sclerosis. Although Nolan and her team thought that patients would want to give up more decision control to the family as patients' illnesses advanced, patients' preferences for a style of decision-making that was independent, shared or reliant on the family remained stable even as the patient's health declined. The implications of the research showed that end-of-life discussions about how patients want decisions about treatments to be made can begin early on, not just when a patient is nearing death.

Two intervention studies conducted by Nolan's team helped patients and their family member surrogates with the difficult task of making these end-of-life decisions. The Tailored End-of-Life Decision-Making Intervention increased support for shared decision-making, helped with surrogate-patient agreement and surrogate decision satisfaction and decreased surrogate decision distress. A preliminary study of the Implantable Cardioverter Defibrillator (ICD) Tailored Intervention supported education and decision-making surrounding the deactivation of ICDs at the end of life when repeated shocks become uncomfortable for patients. Most patients did not know deactivation of the ICDs was an option or why it would be necessary. When fully informed about the option for deactivation, patients and family members did develop a plan.

Nolan is professor and executive vice dean at Johns Hopkins School of Nursing and holds a joint faculty appointment in the Johns Hopkins Berman Institute of Bioethics. She has also served on NIH advisory panels regarding end-of-life care research.

The NINR Director's Lecture Series is designed to bring the nation's top nurse scientists to NIH to share their work and interests with a trans-disciplinary audience. Nolan's lecture is available at https://www.youtube.com/watch?v=hVBhRy3a2HQ.

'ONE OF THE DEANS'

Longtime NIGMS Communications Director Dieffenbach Retires

BY ALISA ZAPP MACHALEK

Thoughtful. Astute. Strategic. Committed to excellence. Those are just some of the words colleagues use to describe Ann Dieffenbach, who retired on Aug. 3 after more than 40 years at NIH, 33 of them as the communications director of NIGMS.

"Under Ann's direction, NIGMS opened up new avenues for communication and interaction with the scientific community and other key audiences," said NIGMS director Dr. Jon Lorsch.

Dieffenbach began her NIH career in 1974 as a summer student at what is now CIT. After graduating from the University of Maryland in 1976, she joined NIA, arriving just weeks after the arrival of its founding director, Dr. Robert Butler, who was a legend in the field of gerontology.

As NIA matured, so did Dieffenbach's career. Within a few years, she had risen to become deputy chief of the information office. In 1983, NIGMS director Dr. Ruth Kirschstein selected her for that institute's top communications job.

At the NIGMS communications office, Dieffenbach fostered a culture of teamwork, creativity, a willingness to try new things and a dedication to continuous improvement. During her tenure, the office launched the institute's web site, two blogs and a presence on major social media sites. It produced award-winning science education materials, publicized Nobel Prizes to 57 grantees and marked the institute's 30th, 40th and 50th anniversaries. The office also led outreach efforts that included Cell Day, a live webchat between NIGMS scientists and secondary school students, and Life: Magnified, a popular exhibition of scientific images at Dulles airport and online.

"One of the things I liked best about this job over the many years I held it is that it stayed very interesting, because it was constantly changing. So I was always looking at new opportunities and new challenges," said Dieffenbach. "In the time I've worked here, we saw the advent of desktop computers for word processing, email, the Internet, blogs and other social media, all of which have transformed the way we do business and improved our ability to hear from and reach out to our many audiences."

NIGMS's Ann Dieffenbach retired Aug. 3 after more than 40 years at NIH.

Dieffenbach nurtured an environment at NIGMS in which communication plays an important role, both internally and externally. Communication and transparency are key elements of the institute's strategic plan and the communications office works in close partnership with scientific and other staff.

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"Ann was one of the 'deans' of the communications directors. I've relied on her wise counsel for many years..."

~JOHN BURKLOW

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To recognize the many significant communication activities of staff outside her office, Dieffenbach created the NIGMS Outstanding Communicator Award in 2005.

Over the years, Dieffenbach advised NIGMS directors and many others on a wide range of communication issues and strategies.

"Ann was one of my go-to people at NIGMS," said former director Dr. Jeremy Berg, who is now editor-in-chief of *Science* magazine. "She is a good listener who would offer clear reactions and opinions. She helped guide me through some challenging situations with her gentle but firm wisdom."

Added Lorsch, "Ann has an amazing ability to spot and manage risks in communication. She was the first person at NIGMS besides the acting director who was allowed to communicate with me before my selection as NIGMS director was announced. She gave me an excellent crash course in doing media interviews and I continue to use what she taught me on a regular basis."

Dieffenbach also helped shape NIH communication policies and practices.

"Ann was one of the 'deans' of the communications directors," said John Burklow, NIH associate director for communications. "I've relied on her wise counsel for many years, whether it's to think through how to strengthen the 'NIH identity' or how we can learn from each other as a community."

Dieffenbach served on the team that developed the NIH strategic communications plan and, for a number of years, she led communications for the NIH Director's Pioneer Award and New Innovator Award programs. For these and other efforts at the NIGMS and NIH levels, she received five NIH Director's Awards, two NIH Awards of Merit and a PHS Special Recognition Award.

One achievement that Dieffenbach is particularly proud of is the part she played in naming the main auditorium in Natcher Bldg. in honor of Kirschstein, who was the first woman to lead an NIH institute and who made many contributions to NIGMS, NIH and the scientific community.

Dieffenbach is known as a sharp-eyed editor, exceptional organizer and careful planner.

"The irony is," she quipped, "I'm still working out my plans for what to do in retirement." Some of those plans include learning new skills and pursuing activities she didn't have time for while working.

As always, she's excited about the opportunities that lie ahead. But she says she'll miss a lot about NIH, "most of all, the smart, talented and dedicated people I have been fortunate enough to interact with on a daily basis."

Promotions Lauded for NIH Commissioned Corps Officers

The 14th annual NIH Public Health Service Commissioned Corps promotion ceremony was held on July 15 at Natcher Conference Center. Each year, NIH acknowledges the accomplishments of Commissioned Corps officers, who continue to carry out the PHS mission to protect, promote and advance the health and safety of our nation. This year, 28 officers were promoted.

Additionally, newly retired officers, new calls to active duty officers and a Commissioned Officer Student Training and Extern Program student were recognized.

As promotions were announced, each officer had family and friends accompany them to the stage to assist with the official changing of the promotion boards. In several instances, board placement was done by a parent or relative who is a retired officer, creating a lasting legacy of service to our nation.

Radm. Helena Mishoe, NIH representative to the Surgeon General's policy advisory council and NHLBI associate director for research training

Officers gather for 14th annual NIH Public Health Service Commissioned Corps promotion ceremony.

and diversity, gave opening remarks and presided over the ceremony. She emphasized that Surgeon General Vivek Murthy is working hard to turn the tide of prescription drug abuse that has reached epidemic levels in this country, affecting every community, with more than 40 people in America dying every day from overdoses involving prescription opioids. She said the Office of the Surgeon General sees this as a public health crisis and has launched the "Turn the Tide Prescription Tour" to address the issue.

"We need every community's help to address this as we work collaboratively to save families and lives," Mishoe said. "How we address this crisis and treat those with prescription drug addictions is a reflection of who we are as a nation."

PHS leadership and guests in attendance at the ceremony included Radm. Susan Orsega of NIH, chief professional officer for the nurse category; Radm. Teri Clark of NIH, representing the veterinary category; Capt. Martin Sanders of the HHS Program Support Center, chief professional officer for the scientist category; Capt. Jeanean Willis Marsh of the Health Resources and Services Administration, chief professional officer for the health services officer category; Capt. Madeline Michael of NIH, chief professional officer for the dietitian category; Radm. Deborah Wilson of NIH's Office of Research Services; and Radm. Richard Childs of the National Heart, Lung, and Blood Institute.

The following officers were promoted: **Medical Officers**—promoted to Capt.: Maria Lindenberg; promoted to Cmdr: Margaret Brewinski-Isaacs; **Nurse Officers**—promoted to Capt.: Margaret Bevans, Linda Ellison-Dejewski, Lea Latham, Leorey Saligan; promoted to Cmdr.: Nam Hoang; promoted to Lt. Cmdr.: Sarah Benzo, Tyhis Coates, Anne Fejka, Janel Parham, Leslie Poudrier, Gail Tarlton, Krystal West; promoted to Lt.: Jodi Blake; **Engineer Officers**—promoted to Cmdr.: Leo Angelo Gumapas; **Scientist Officers**—promoted to Cmdr.: Eric Zhou; promoted to Lt. Cmdr.: Xinzhi Zhang; **Environmental Health Officers**—promoted to Cmdr.: John McLamb; **Veterinary Officers**—promoted to Capt.: Lauren Davidson; **Pharmacy Officers**—promoted to Lt. Cmdr.: Jun Lee; **Dietitian Officers**—promoted to Lt. Cmdr.: Kelly Ratteree; **Health Services Officers**—promoted to Capt.: Martin Ruiz-Beltran; promoted to Lt. Cmdr.: Richard Johnson, Tameika Kastner, Margaret Kemp, Sarah Lee, Megan Morgan.—**Helen Cox, Kristen Cole**

Corps Receives Presidential Citation for Ebola Response

Recently, active duty and ready reserve Commissioned Corps officers received authorization to wear the Presidential Unit Citation presented Sept. 24, 2015, by President Barack Obama during an Oval Office ceremony. Such ceremonies for unit awards rarely occur, so the occasion was special.

Radm. Helena Mishoe (front, c) presents a unit citation to the NIH officers for their response to Ebola.

The citation was awarded for "extraordinary courage and the highest level of performance in action throughout the response to the Ebola outbreak."

According to the citation, "Commissioned Corps officers were the only United States Government asset to provide direct patient care to health care workers with Ebola in West Africa."

On July 15, Radm. Helena Mishoe, NIH representative to the Surgeon General's policy advisory council and NHLBI associate director for research training and diversity, presided over a special award ceremony to formally present the unit citation to the NIH officers. Acknowledging the historic honor, Mishoe called the officers to attention for the reading of the citation. It was the first formal recognition of those receiving the award in the presence of their fellow officers, colleagues, families and friends. Mishoe concluded, "This is a proud day for the corps, our agency and our nation." R

VOLUNTEERS

Study Seeks Healthy Older Adults

Healthy older adults, ages 55-70, are invited to participate in an outpatient research study investigating the benefits of tart cherry and aroniaberry supplementation on vascular health. The goal of the study is to determine whether the supplements improve blood flow and blood vessel function that can affect your heart. Eligible participants must be medication-free and in good general health. The study will be carried out in an outpatient clinic and includes 7 visits over 3-4 months. Compensation for the study is provided. For more information, call 1-800-411-1222 (TTY 1-866-411-1010) and refer to study 15-NR-0085 or visit www.clinicaltrials.gov.

Study Seeks Healthy Adults

Healthy older adults, ages 55-75, are invited to participate in an outpatient research study investigating the benefits of omega-3 oil and blackcurrant supplements on vascular health. The goal of the study is to determine whether the supplements improve blood flow and blood vessel function that can affect your heart. Eligible participants must be medication-free and in good general health. The study will be carried out in an outpatient clinic and includes 4 visits over 6 months. Compensation is provided. For more information, call 1-800-411-1222 (TTY 1-866-411-1010) and refer to study 14-NR-0034.

Above and right, the future home of an industrial water system

Large-Scale Construction Continues on Campus

PHOTOS: CARLA GARNETT

Several large-scale construction projects on the Bethesda campus have surged forward in recent weeks. Excavation continues at both sites of the Assure/Expand Chilled Water Capacity project.

In the southeast quadrant, a large section of parking lot 41 is fenced in, off limits to vehicular and pedestrian traffic. That's the future home of a 5-million-gallon water tank—an industrial water system—being built to help NIH's Central Utility Plant in an emergency power shutdown. [For details, see https://nihrecord.nih.gov/newsletters/2016/03_11_2016/story4.htm.] Campus shuttle buses now operate on a modified route through the area.

In the center of campus (right, center), where Lincoln Dr., Convent Dr. and Service Rd. West meet, the shell of Bldg. 34 has gradually disappeared, replaced by a sizable hole where the second and larger of two new water towers—a thermal energy storage system—will be erected.

Both towers are looking at October 2017 completion estimates.

ABOVE: A birdseye view of the northwest quadrant of campus, where two work zones occupy Center Dr., near the NIH Fire Station. LEFT: At top, on the Safra Family Lodge side of the street, utility tunnel construction that began in April is on target to finish in December. A portion of Center Dr. is temporarily fenced in with white concrete barriers, preventing pedestrian traffic and narrowing vehicular use of the road. On the Fire Station side (bottom), erection of the new Northwest Child Care Center, Bldg. 23, is under way. [See https://nihrecord.nih.gov/newsletters/2016/07_01_2016/story5.htm for design elements and features of the facility.] Construction is slated to end in February 2017; the new day care is set to open in spring.