

NIH RECORD

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CELEBRATING OUR SCIENTISTS NIH Honors Intramural Community at 30th Research Festival

BY DANA TALESNIK

“This field is just bursting wide open with opportunity and potential,” NIH director Dr. Francis Collins told an inquisitive audience member about epigenomics. His talk kicked off the 30th NIH Research Festival, held Sept. 14-16 in the Clinical Center.

Each year around this time, intramural researchers emerge from their labs to check out the work of their peers. While much attention is often lavished on extramural grantees throughout the country and world, Research Festival honors the nearly 6,000

investigators doing ground-breaking work in the CC and across campus every day.

Research Festival is designed in a way “that engages most of the community, doesn’t totally intrude on people’s research time, but gives people the opportunity to get out and get to know each other,” said NIH deputy director for intramural research Dr. Michael Gottesman.

This year, symposia highlighted the intramural community’s progress in precision medicine, inflammation and chronic disease, the microbiome and computational biology, to name a few topics. Postdocs and institute directors displayed and discussed their



The NIH Library offered virtual reality training in Bldg. 10.

scientific posters. And investigators learned about new technologies and how to make their labs greener.

SEE FESTIVAL, PAGE 6



Cool your jet? Newer energy-efficient 747-style engine arrives to power campus. See p. 1.

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CC director Dr. John Gallin at Town Hall event

‘HOUSE OF HOPE’ ENTERS NEW PHASE At Latest Town Hall, CC’s Future To Be Determined by Those Who Know It Best

BY CARLA GARNETT

People who know the Clinical Center best should take the lead in shaping its future. That was the message Sept. 7 at the latest CC Town Hall Meeting to give a progress report on NIH’s effort to restructure

SEE CC TOWN HALL, PAGE 4

WILL SAVE MILLIONS

ORF Upgrades Cogeneration Power Plant

BY ERIC BOCK

A combustion turbine that has efficiently powered a generator in NIH’s Cogeneration Plant for the past 12 years has recently been replaced with a newer, more efficient model.

The new unit, similar in technology to aircraft jet engines, is a Siemens SGT-600 3rd generation dry low emissions combustion system gas turbine. It replaces the 12-year-old ABB GT10 gas turbine, said Dr. Farhad Memarzadeh, director, Division of Technical Resources, Office of Research Facilities. The new engine begins supplying energy to campus this month.

Cogeneration or “cogen,” he explained, is a process where a fuel source, like natural gas, is used to produce steam and electricity simultaneously, requiring much less fuel (and fewer emissions to the atmosphere)

SEE COGEN, PAGE 10

NCI Adopts Roadmap to Achieve Moonshot Goals

National Cancer Institute acting director Dr. Douglas Lowy recently accepted the recommendations of a blue ribbon panel on 10 recommendations most likely to make a decade's worth of progress against cancer in 5 years, a key goal of the White House Cancer Moonshot.

The report was presented by the panel and approved by the National Cancer Advisory Board. With this roadmap in hand, NCI plans to move forward in investing in these areas of research.

In addition to the 10 scientific recommendations, the roadmap has additional specific, special projects. These include a demonstration project to test for Lynch syndrome, a heritable genetic condition that increases risk of several types of cancer, to improve early detection and prevention; establishment of a nationwide pediatric immunotherapy clinical trials network to enhance the speed with which new immunotherapies can be tested in children; exploring patient-derived organoids; and "microdosing" devices to test drug responses in living tumors.

Lowy will share these recommendations with the Cancer Moonshot task force.

"I am deeply indebted to the 28 outstanding individuals who have served on the blue ribbon panel and to the 150 working group members who put aside business as usual to contribute their years of expertise to this once-in-a-lifetime opportunity," said Lowy. "NCI is also greatly appreciative of Vice President Biden's leadership and passion for the Cancer Moonshot and for motivating all who have been working so hard to make it a reality."

To view the 10 recommendations and read the full report, visit www.cancer.gov/BRP.

OD Celebrates ACEP Graduates

The NIH Office of the Director recently celebrated the second graduating class of the Administrative Career Enhancement Program (ACEP). Participants in this OD development program heard remarks from LaVerne Stringfield, associate director for management, OD, and a commencement address from Calvin Jackson, deputy associate director for communications and public liaison.

Jackson encouraged graduates to "stay in touch with your mentors, both formal and informal, network with your fellow ACEP classmates, ask for what you want and do something that will get you out of your comfort zone on a regular basis. That is one of the best ways to grow and learn. Also, remember that character counts." Jackson concluded by reciting the poem *If* by Rudyard Kipling.

ACEP, an initiative of the OD Voice, was formed to address organizational awareness and professional development for OD employees. The OD Voice analyzes yearly Employee Viewpoint Survey data and makes recommendations to increase employee engagement, enhance morale and capitalize on areas in which the OD excels.



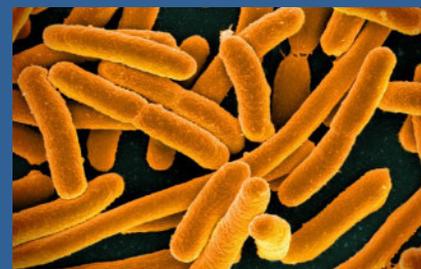
New ACEP graduates include (front, from l) Tanya Barnett, Alisha Washington, Avraham Gross, Toddchelle Young, Stephanie Jackson, Lynne Williams, Ileana Turner. At rear are (from l) Stephanie Bonhomme, Zina Abdelaziz, Kimberly White, Anne Smogur-Saldivar, Lakeisha Washington. Not shown are Woleola Akinso and Caviaunce Phillips.

ACEP provides training and development to OD employees at the GS-12 level and below. Participants are nominated to the program by their supervisor.

ACEP is supported by Dr. Lawrence Tabak, NIH principal deputy director, and also strongly supported by OD leadership. As a result, the program continues to be offered at no cost to staff by utilizing the knowledge and expertise within OD.

"I am so thankful that I was accepted into the ACEP program," said recent graduate Anna Smogur-Saldivar. "The thoughtfully crafted sessions were led by welcoming senior staff members who helped us polish our skills—from mediation to written and oral presentations. ACEP also afforded me the opportunity to interact with peers whom I might not normally meet within such a large IC. ACEP allowed us to see how we fit into the larger OD structure."

To find out more, visit https://www.training.nih.gov/for_expo_exhibitors_and_speakers.



ON THE COVER: *Colorized scanning electron micrograph of Escherichia coli bacteria, grown in culture*

IMAGE: NIAID

Community College Day Scheduled

Oct. 28

The NIH Office of Intramural Training & Education will hold Community College Day 2016 on Friday, Oct. 28 from 8 a.m. to 4 p.m. at the Natcher Conference Center. The event provides community college students and faculty an opportunity to visit the NIH campus and learn about careers and training opportunities in biomedical and health care fields. To register and for more information visit www.training.nih.gov.

FelCom's International Expo, Oct. 20

The 10th International Opportunities Expo, sponsored by the visiting fellows subcommittee of the NIH fellows committee (FelCom), is scheduled for Thursday, Oct. 20 from noon to 4:30 p.m. in the NIH FAES Education Center, Bldg. 10. Postdoctoral fellows and graduate students interested in pursuing international science careers can meet with representatives from embassies, funding agencies and globally minded science and health organizations who will be on hand to promote their programs and resources.

The NIH Record

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STETTEN LECTURE SET, OCT. 19

Biological Chemist O'Halloran To Discuss Metals' Roles in Cellular Functions

Inside our bodies is a surprising amount of metal. Not enough to set off the scanners at the airport or make us rich, but enough to fill each of our cells with billions of metal ions, ranging from calcium to zinc. These particles perform critical biological functions. However, too much of any particular metal can be toxic, while too little can cause disease. A whole series of proteins that bind, sense and transport metal ions ensures that the ions flow into and out of our cells at the right time and in the right amounts.

The molecular mechanisms that control these fluxes are the focus of this year's DeWitt Stetten Jr. Lecture by Dr. Thomas O'Halloran of Northwestern University. His talk, on Wednesday, Oct. 19 at 3 p.m. in Masur Auditorium, Bldg. 10, is titled "Elements of Health and Disease: Inorganic Fluxes and Metal Receptors That Control Cell Fate Decisions." The event is part of the NIH Director's Wednesday Afternoon Lecture Series and is sponsored by NIGMS.

For the past three decades, O'Halloran has investigated how fluctuations in the amount of metal ions inside cells influence key cellular decisions such as gene expression and cell growth. Using a variety of approaches, he has uncovered new types of proteins that bind metal ions and tied their function to a number of disease-related physiological processes. These insights have led to the development of drugs that work on the proteins.

O'Halloran and his team recently demonstrated essential roles for intracellular zinc fluctuations in the maturation and fertilization of mammalian egg cells. The research group established that the uptake of billions of zinc atoms regulates the stages of meiosis, the process in which chromosomes are copied, paired up and separated to create eggs or sperm. In contrast, zinc must exit the egg rapidly before embryonic development can proceed. These findings may one day be useful in improving *in vitro* fertilization methods.

O'Halloran is a professor in the departments of chemistry and molecular biosciences. He is also founding director of the Chemistry of Life Processes Institute and director of the Northwestern University Physical Sciences-Oncology Center. O'Halloran earned a B.S. and an M.A. in chemistry from the University of Missouri in 1980 and a Ph.D. in chemistry from Columbia University in 1985. He studied the role metals play in regulating biological processes as a Ruth L. Kirschstein National Research Service Award postdoctoral fellow at the Massachusetts Institute of Technology.

O'Halloran's honors include a Sloan research fellowship, a Guggenheim fellowship, a Searle scholar award, an NIH MERIT award and a Presidential Young Investigator Award. He is a fellow of the American Association for the Advancement of Science, the Japan Society for the Promotion of Science and the Royal Society of Chemistry. O'Halloran holds 10 patents and is the co-founder of 3 pharmaceutical companies.

For more information or for reasonable accommodation at the lecture, contact Jacqueline Roberts at Jacqueline.Roberts@nih.gov or (301) 594-6747. —Chris Palmer

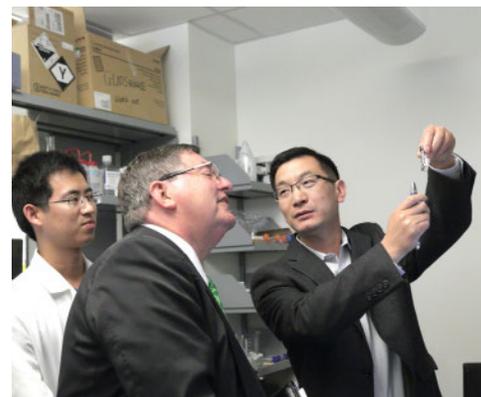


Dr. Thomas O'Halloran



Physician-Congressman Visits NIH

Above, Rep. Michael Burgess (R-TX, I), a physician, tours the NIBIB Laboratory of Molecular Imaging and Nanomedicine in the Porter Neuroscience Research Center with NIBIB director Dr. Roderic Pettigrew (c) and lab chief Dr. Shawn Chen. Chen's lab develops new imaging probes for diagnosis and treatment monitoring as well as nanomedicine for drug and gene delivery. Below, Chen (r) shows Burgess an example of the Tyndall effect—in this instance, a column of light when nanoparticles suspended in liquid reflect the colored beam of a laser pointer. Dr. Fuwu Zhang looks on.



In the bottom photo, Dr. Sung-Youl Ko of the NIAID Vaccine Research Center demonstrates an assay used in Zika virus vaccine development for Burgess. Looking on are (from l) NIAID director Dr. Anthony Fauci, VRC director Dr. John Mascola and VRC deputy director Dr. Barney Graham, who provided the congressman with a tour of the VRC prior to the lab demo.

PHOTOS: BILL BRANSON





At left, Dr. Andy Griffith, who will oversee a new research support and compliance office, addresses an issue during the open mic portion of the town hall meeting. The new office falls under the purview of Dr. Michael Gottesman (above), NIH deputy director for intramural research.

CC Town Hall

CONTINUED FROM PAGE 1

hospital operations. NIH director Dr. Francis Collins also introduced several new NIH staff members and components involved in strengthening the Clinical Center and encouraged a new outlook.

“Our efforts here will shape the future of biomedicine and the future of every single patient that comes through our doors seeking answers and looking for hope, because we are, after all, the House of Hope,” said Collins, who opened his remarks with a “big shout-out” to CC staff.

“I think you are among the most dedicated and visionary medical researchers and caregivers on the planet,” he said, noting that he has recently been going on patient rounds with some of the CC’s ward teams. “I see your commitment to outstanding patient care and extraordinary scientific accomplishment as truly inspiring. Thanks to you, many lives have been saved and many more will be saved in the future...The Clinical Center is rightly a national treasure. Our goals with the steps that are under way and that we’ll be talking about today are not to do anything that would harm that status as a national treasure; no, but instead to make that national treasure even more perfect.”

Restructuring was prompted more than a year ago, following discovery of major lapses in preparation of sterile injectables in the pharmacy. That led to a comprehensive review of the hospital by an external team of experts known as the Red Team, which

offered a critical appraisal and a number of recommendations to enhance patient safety.

At this town hall, Collins urged NIH’ers to recognize the Red Team recommendations as a starting point, but to develop our own improvement plan.

Let’s “collectively say, ‘Maybe there are some things that we could be even better at,’” he suggested. The inclination now should be “not to defend against what was already said, but to consider improving in ways that haven’t been mentioned...People [already here] know a lot more about the Clinical Center than any external group ever will,” he said, talking to an audience composed mainly of CC staff. “You probably have some ideas about things that could run more smoothly, things that could be better for research and better for patient care. That’s what we want to capture...I hope we take this opportunity to think positively and creatively about how to make this place even more amazing.”



Gallin talks about his new post, which is also strategically located within OIRM.

CC director Dr. John Gallin, who in August accepted a newly created dual position as NIH associate director for clinical research and chief scientific officer for the Clinical Center, expressed his eagerness to get started on a new path forward.

His new role, he said, will allow him “to help expedite some of the very positive changes that will transform our clinical research resources to levels that have not previously been possible. For this to happen, we all need to embrace some new activities.”

He described seven major functions of his new post:

- Oversight of scientific review for all clinical protocols in the intramural program
- Setting priorities across institutes and centers for clinical research conducted here
- Oversight of strategic planning for intramural clinical research
- Review of IC directors’ oversight of their clinical directors
- Scientific direction of the CC, overseeing independent research programs of investigators working at the CC
- Developing strategic partnerships to expand clinical research collaborations among intramural and extramural programs, and
- Oversight of clinical research training programs.

“I’m anxious to get things moving quickly—even before the new CEO is identified,” he said. “The initial priorities will be the first two duties...I look forward to pursuing this new adventure with you.”



NIH deputy director for intramural research Dr. Michael Gottesman talked briefly about two new groups that will also help map out new ways for the Clinical Center to operate: a steering committee consisting of senior NIH clinicians and leaders, chaired by Gottesman, and a CC engagement working group representing a cross-section of NIH that will organize focus

components and members of the CC leadership team:

- NIDCD scientific director Dr. Andy Griffith will oversee the new Office of Research Support and Compliance (ORSC) until a permanent director is recruited. He will chair the CC engagement working group.
- Dr. Bruce Burnett, a regulatory compliance expert on loan from Duke University for a

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“The promise of change—especially sagely directed by the insights and experience of one of our nation’s most brilliant and caring workforces, that’s you—is very compelling.”

—DR. FRANCIS COLLINS

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sessions to collect essential commentary and suggestions from those who know the CC best—staff and patients.

“We all know that the Clinical Center is the physical and emotional heart of the NIH campus and what you do is provide hope to all of the patients who come here, sometimes with profoundly difficult and debilitating diseases,” Gottesman noted. “The purpose of the meeting today is to get your input on a process we are assembling to allow you to be the determinants of the change we make at NIH. It’s really important that the people who work in the trenches are involved in the changes that are inevitably going to happen. And we want this opportunity for you to speak up about the process we’re going to use.”

Collins introduced several other new

year, will play a leading role with ORSC.

- A lawyer with expertise in human subjects protection, Valerie Bonham, has joined NIH as ORSC deputy.
- Dr. Majid Tanas began work last month as new chief of the pharmacy; Dr. Carolyn Lawrencot is senior regulatory affairs specialist for pharmaceuticals development.

Leading the discussion with the focus groups, which will consist of NIH staff, will be Stewart Simonson, former HHS assistant secretary for public health emergency preparedness (2001-2006).

“My happiest memories of that time are here at NIH,” he said, moderating the open mic portion of the town hall. “Of this place, I have nothing but happy memories. On this campus, there is no place more important to me than the Clinical Center. [Former HHS



At left, NIH director Dr. Francis Collins urges CC staff to “take this opportunity to think positively and creatively about how to make this place even more amazing.” Above, Stewart Simonson says his happiest HHS memories occurred here. He’ll lead CC focus group discussions.

PHOTOS: ERNIE BRANSON

Secretary Tommy] Thompson used to say the Clinical Center was, in his experience, ‘the most moving, the most tender-hearted and the most impressive institution in all of HHS.’ And my experience was that too.”

He said he’s prepared to convene “as many focus groups as interest warrants... There are no limits within reason to what we will discuss. The purpose of these sessions is not to re-litigate or flyspeck the Red Team report, [but] I also don’t want to suppress discussion in any way...What comes out of these focus groups will be faithfully carried forward to the new CEO, the hospital board and to Bldg. 1.”

The focus groups that Simonson leads will be formed from NIH staff who can sign up at <http://intranet.cc.nih.gov/focusgroups.html>.

Collins summarized the first meeting of the new hospital board of directors, held in July. He mentioned that the CEO search, under way across the nation, will close soon.

“Your input is an essential component of the decision-making process,” he concluded. “I know that change can be sometimes unsettling and disruptive, and we want to hear your thoughts about how to make this place even better...Change can be unsettling, but standing still in an area where science is changing rapidly, and so is medical care, would be potentially even more perilous. The promise of change—especially sagely directed by the insights and experience of one of our nation’s most brilliant and caring workforces, that’s you—is very compelling.”

NIH’ers can view the entire meeting at <https://videocast.nih.gov/summary.asp?Live=19661&bhcp=1>. **R**



At left, NCI acting director Dr. Douglas Lowy explains his poster. At right, NIDDK's Dr. Brianna Bingham discusses her research on insulin resistance in African-American women at a poster session.

PHOTOS: ERNIE BRANSON

Festival

CONTINUED FROM PAGE 1

The Epigenome & Diabetes

Collins took off his director's hat and spoke as an impassioned geneticist and intramural scientist, touting his lab's recent advances in type 2 diabetes research. The disease afflicts some 30 million Americans and 80 million are at high risk, or pre-diabetic. Exacerbating the condition is

chronic over-nutrition. "Insulin resistance inspired by obesity puts further stress on the pancreas...and ultimately beta cells fail to keep up and glucose rises," he said.

Collins noted that researchers have had a tough time identifying contributing genetic variants because type 2 diabetes is not inherited in a predictable way. His NHGRI lab, in collaboration with the University of Michigan and Finnish investigators, has embarked on a genome-wide association

study (GWAS). Globally, they've analyzed more than 30,000 DNA samples. Working with other groups, they have found at least 86 risk variants, called SNPs, for type 2 diabetes.

"The good news is we've been successful in utilizing this strategy to nail down a long list of risk factors for this complex polygenic condition," Collins said.

But they almost had to guess which genes are involved because more than 90 percent of the variants discovered by GWAS are non-coding. Instead, they are regulatory variants.

Through genotyping and RNA-sequencing of relevant tissues, they're starting to identify the target genes of these variants, which could provide a critical lead to new drug targets. Of these tissues, pancreatic islet cells seem to hold a big piece of the puzzle.

Searching through the non-coding parts of the genome can be daunting, but by utilizing epigenomic methods that allow identification of the parts that are functionally active, the Collins lab uncovered a theme. "Stretch enhancers," so named

Plaque Commemorates Research Animals

The NIH intramural animal research advisory committee and the IC animal program directors dedicated a plaque that commemorates "research animals and the NIH animal care and use community that have contributed to our exceptional biomedical research advances" at a Sept. 16 ceremony on the Clinical Center's south lawn. NIH director Dr. Francis Collins presented remarks at the program, part of Research Festival.

"I hope, going forward, when the next breakthrough happens here on the NIH campus—some big development that has big promise for human health—that people will walk by this plaque and recognize how we got there," Collins said. "The animals that we depended on are also part of that celebration...we can look back on their contribution and their sacrifice and be truly grateful."

Collins understands how important animals are to research. His laboratory studies Hutchinson-Gilford progeria syndrome, an exceedingly rare progressive disorder that causes children to age rapidly. Progeria affects roughly 250 children worldwide.

After discovering the cause of the syndrome, he began studying potential treatments. With help from the "wonderful" animal care staff at NHGRI, including its retired animal program director Dr. Shelley Hoogstraten-Miller, Collins' lab developed

mouse models of progeria. One therapeutic showed enough promise in mouse models to be tested in a clinical trial. Results from the trial suggest the drug extends the lives of patients by 4 or 5 years. A second complementary therapy is currently being tested.

"All of this is dependent on that mouse model and all of those animals that have been involved in this research," Collins said.

He thanked staff involved in animal care at NIH. "I'm impressed and touched every day by what I see," he concluded. "A lot of people don't know about it, but I know about it. Thank you to all of you."

The ceremony also featured remarks by NIH deputy director for intramural research Dr. Michael Gottesman, NEI senior investigator Dr. Rachel Caspi and Hoogstraten-Miller. Dr. Terri Clark, director of the NIH Office of Animal Care and Use, hosted the ceremony.

Clark credited Hoogstraten-Miller for coming up with the idea to permanently recognize the contributions of research animals. The plaque, which features the NIH Office of Animal Care and Use logo along with the words, "With recognition and gratitude to the research animals and the NIH animal care and use community that have contributed to our biomedical research advances," is affixed atop a tree-shaded stone near the CC's south entry. Two benches surround the mulched area where the memorial sits.—Eric Bock



Unveiling the plaque are NIH director Dr. Francis Collins (l) and NIH deputy director for intramural research Dr. Michael Gottesman. Below, also on hand for the event are (from c) retired animal program director Dr. Shelley Hoogstraten-Miller, NEI senior investigator Dr. Rachel Caspi and Dr. Terri Clark, director of the NIH Office of Animal Care and Use.



• • •

“We’re a world-class library that supports resources people need to do research in traditional ways, but we also go above and beyond to help create the ideal lab scenario.”

—KATHLEEN MCGLAUGHLIN

• • •

because they contain DNA elements that enhance transcription of nearby genes and stretch over long distances, were discovered in areas of tissue-specific gene expression, said Collins. In type 2 diabetes, 61 of 86 GWAS signals fell within an islet stretch enhancer. Using methods that provide “footprints” of potential transcription factor binding, the lab zeroed in on the protein RFX6, which is only expressed in the pancreatic islet.

“We think we’re onto something here,” Collins said. “We’ve discovered a general



At left, NIH deputy director for intramural research Dr. Michael Gottesman (r) points out details of his poster to a visitor. At right, NIH director Dr. Francis Collins kicks off the festival with a scientific talk.

phenomenon of pancreatic biology—variations in stretch enhancers in the islet—that play a role in type 2 diabetes. By having these technologies and these insights, we’re beginning to shed light on inherited risks and what we can do about that toward the development of interventions and new treatments.”

To Investigators: Use Your Imagination

Want to try out some innovative tools to expand your research potential? The NIH

Library challenges NIH investigators to use some of its latest technology and think up novel ways to use these gadgets for basic and clinical research. Library staff is available to train and assist and then the sky’s the limit.

“We’re a world-class library that supports resources people need to do research in traditional ways, but we also go above and beyond to help create the ideal lab scenario,” said Kathleen McGlaughlin, communications librarian. “We want investigators to ask themselves: ‘How can I solve my research problem with this technology?’”

The NIH Library has 3-D printers that create colorful casts. Create a plastic gene or a brain or heart model. One NIH doctor used 3-D printing to create a protein model with a specific mutation for his patient, to help him understand his diagnosis, said Medha Bhagwat, bioinformatics support program coordinator.

Some investigators stopped by the NIH Library to test out virtual reality headsets. The stations featured games, a virtual underwater experience and a hospital room simulation. Several ICs are already testing out such realistic physical simulations for patient rehabilitation, such as allowing patients to practice certain tasks before they’re released from the hospital. VR technology has the potential to test medical students in a virtual clinic, provide surgical training and foster doctor-patient interactions remotely.

“We’ll make this technology available to you,” said McGlaughlin. “Use your imagination.”

The NIH Library also just launched a self-service digital production studio. NIHers can sample data visualizations and software, including smartpens, and try out

Today’s Scientists, Tomorrow’s Leaders

What, exactly, goes on in NIH’s 200 intramural research labs? How are they different from university labs and why should a young investigator start a career here?

“NIH is an amazing opportunity,” NIH director Dr. Francis Collins told 29 early career researchers visiting NIH for the 2016 Future Research Leaders Conference (FRLC).

The event is sponsored by NIH’s inaugural chief officer for scientific workforce diversity Dr. Hannah Valentine. Her office invited 29 scientists from across the country to Bethesda for two important reasons: to introduce them to the unique work environment at NIH and to connect NIH intramural scientists to great talent.

In opening remarks, Valentine emphasized the human side of science. “Connecting people with common scientific interests is as important as the science itself,” she said.

And that is what the FRLC did. An intense 3-day experience featured talks from top leadership, including Collins, Valentine, IRP head Dr. Michael Gottesman and NHLBI director Dr. Gary Gibbons. Participants gave research talks, presented posters and met one-on-one with NIH scientific directors and branch chiefs—about 100 meetings were held. A half-day seminar on NIH grant process and meetings with NIH program and review staff rounded out the schedule.

Most conference participants are from underrepresented groups in the sciences. Most are past recipients of NIH-funded diversity supplements, which enable NIH-funded researchers at universities to bring diverse students and postdocs into their labs for research experiences and mentoring.

The FRLC is intentionally embedded within the NIH Research Festival, giving attendees the opportunity to fully engage with this annual celebration of NIH science.

Said attendee Esther Obeng, from Harvard Medical School, “I’ve met a lot of wonderful people...People that had been here for years and told me why they haven’t left...what they loved about NIH.”—Alison Davis





Festival poster sessions stretched out over several days and drew many visitors.

CONTINUED FROM PAGE 7

the various recording gadgets to create presentations, or perhaps podcasts or tutorials, said Derek McDowell, NIH Library reference assistant. To learn more, visit nihlibrary.nih.gov/techhub.

Going Green

Laboratories generate a lot of disposables; many people don't realize how much of that waste is recyclable or can be repurposed. At the Green Labs Expo, the Division of Environmental Protection's Jacqueline McGauley and the Office of Research Facilities' John Prom told investigators and staff about ways to reduce waste, safely dispose of solvents and how to properly recycle batteries, fluorescent light bulbs and thermometers. They also reminded NIH'ers to donate or seek out surplus solvents and equipment via NIH FreeStuff, <http://stuff.nih.gov>.

Research Festival enlightened and inspired and got researchers of all ages thinking about the future of their fields. Following his talk, Collins had some advice for that inquisitive audience member.

"Anybody who wants to work in this field, or virtually any other area in the way biology is going, needs to get very sophisticated about the computational part because that is clearly where the big insights are going to come from," he said. "Big data sets are out there, made increasingly available because NIH is insisting on that kind of open data access. But the exciting and difficult part is making the most out of it, designing the right algorithms, building the right programs and knowing how to code and then coming up with those biological insights that otherwise might have been missed." **R**

Depression in Early Pregnancy Linked to Gestational Diabetes, Study Finds

Researchers at NIH have discovered a two-way link between depression and gestational diabetes. Women who reported feeling depressed during the first two trimesters of pregnancy were nearly twice as likely to develop gestational diabetes, according to an analysis of pregnancy records. Conversely, a separate analysis found that women who developed gestational diabetes were more likely to report postpartum depression 6 weeks after giving birth, compared to a similar group of women who did not develop gestational diabetes.

The study was published online in *Diabetologia*.

Gestational diabetes is a form of diabetes (high blood sugar level) occurring only in pregnancy, which if untreated may cause serious health problems for mother and infant.

"Our data suggest that depression and gestational diabetes may occur together," said the study's first author, Dr. Stefanie Hinkle of NICHD. "Until we learn more, physicians may want to consider observing pregnant women with depressive symptoms for signs of gestational diabetes. They also may want to monitor women who have had gestational diabetes for signs of postpartum depression."

Although obesity is known to increase the risk for gestational diabetes, the likelihood of gestational diabetes was higher for non-obese women reporting depression than for obese women with depression.



The FDA recommends that children and women of childbearing age eat 2 to 3 weekly servings of fish low in mercury as part of a healthy diet.

Brain Benefits of Aerobic Exercise Lost to Mercury Exposure

Cognitive function improves with aerobic exercise, but not for people exposed to high levels of mercury before birth, according to research funded by NIEHS. Adults with high prenatal exposure to methylmercury, which mainly comes from maternal consumption of fish with high mercury levels, did not experience the faster cognitive processing and better short term memory benefits of exercise that were seen in those with low prenatal methylmercury exposures.

This is one of the first studies to examine how methylmercury exposure in the womb may affect cognitive function in adults. Mercury comes from industrial pollution in the air that falls into the water, where it turns into methylmercury and accumulates in fish. The scientists, based at Harvard's T.H. Chan School of Public Health, suspect that prenatal exposure to methylmercury, known to have toxic effects on the developing brain and nervous system, may limit the ability of nervous system tissues to grow and develop in response to increased aerobic fitness.

The findings were published Sept. 9 in the journal *Environmental Health Perspectives*.

"We know that neurodevelopment is a delicate process that is especially sensitive to methylmercury and other environmental toxins, but we are still discovering the lifelong ripple effects of these exposures," said Dr. Gwen Collman of NIEHS. "This research points to adult cognitive function as a new area of concern."

The Food and Drug Administration recommends that children and women of childbearing age eat 2 to 3 weekly servings of fish low in mercury as part of a healthy diet. Low-mercury fish include salmon, shrimp, pollock, canned light tuna, tilapia, catfish and cod. Four types of fish should be avoided because of typically high mercury levels—tilefish from the Gulf of Mexico, shark, swordfish and king mackerel.

Scientists Detail Pathways for Addressing Antimicrobial Resistance

Researchers must address the growing problem of antimicrobial resistance and stay ahead of the inevitable future emergencies of resistant bacteria, according to physicians and scientists at NIAID. Writing in the Sept. 20 issue of *JAMA*, the authors stress the urgent need for new strategies to identify and develop new antibiotic drug candidates and vaccines and other interventions to prevent bacterial infections.

In the United States, antimicrobial-resistant bacteria cause more than 2 million infections and 23,000 deaths each year, resulting in an estimated \$20 billion in excess medical spending. Inappropriate antibiotic prescribing practices in human medicine, agricultural use of antibiotics to promote animal growth and challenging bacterial genetic characteristics have contributed to the resistance problem, the authors write.

The authors emphasize that certain of these issues are already being addressed through public education campaigns. However, they should be augmented by proven public health initiatives such as vaccination against bacterial infections and expanded access to clean water and sanitation.



Among the 38 physician assistants working at NIH are (seated, from l) Margaret Beach, Elizabeth Laidlaw, Jacquelyn Lane, Theresa Jerussi and Ülgen Fideli. Standing are (from l) Mary B. Stevens, Richard Kwan, Merate Legesse, Tiffani Taylor, Catherine Vangellow, Elizabeth Omasta and George Carter.

PHOTO: RICH MCMANUS

Physician Assistant Profession Marks Golden Anniversary

Oct. 6 marks the golden anniversary of the physician assistant (PA) profession. In the mid-1960s, Dr. Eugene Stead of Duke University Medical Center recognized a physician shortage and the need to improve access to medical care. To help remedy this, he put together the first class of PAs in 1965, selecting four Navy hospital corpsmen who had received considerable medical training during their military service. Stead based the curriculum of the PA program on his knowledge of the fast-track training of doctors during World War I.

The first 50 years have been highlighted by increasing acceptance of PAs by health care teams and, above all, by patients; the collaboration between physicians and PAs is especially effective

because of their historical ties, the similarities in their education and the PA profession's commitment to team practice. Concurrently, regulations governing medical practice were amended to allow PAs to function in a manner consistent with their training. Employers soon learned that the addition of PAs to their practice teams decreased wait times, improved patient satisfaction and ultimately reduced costs for the clinic.

In recent years, the PA profession has undergone a dramatic growth spurt, with over 110,000 PAs currently in the U.S. The PA profession has consistently been ranked among the top 10 fastest-growing occupations. Couple this with PA surveys reflecting high levels of job satisfaction and PAs enjoy a

win-win situation—the patients they serve and the American health care system. The PA profession has extended internationally, with training programs in Canada, United Kingdom, Australia and the Netherlands. Currently, there are 4,800 PAs serving in the U.S. government, with 38 currently at NIH. The Public Health Service has some 200 active duty PAs serving across all of the HHS agencies as well as other federal outposts.

So what is a PA? PAs are experienced allied health care professionals who have a graduate-level medical education using the “medical model” employed in U.S. medical schools to provide care in collaboration with a physician. The rigorous full-time training spans 2-3 years and includes didactic training that focuses on primary care aspects of medicine and surgery and clinical rotations culminating in a national licensure and certification examination.

Physician assistants are required to continue their education process with a minimum of 100 continuing education hours every 2 years in addition to sitting for a recertification examination every 10 years. Besides clinical practice, PAs function in various capacities including clinical and scientific research, policy development and clinical administration.

“These first 50 years would not have been possible without the ongoing support of our physician colleagues, the medical nursing care community and, above all, the patients we all serve,” said Richard Kwan, a PA in the critical care medicine department at the Clinical Center. “Some may successfully argue that medical care is a right, but PAs know that the provision of medical care is indeed a privilege.”

For more information about physician assistants, visit www.AAPA.org. **R**

NINR Nursing Research Highlighted At AcademyHealth Meeting

The National Institute of Nursing Research recently participated in AcademyHealth's annual research meeting, which brought together more than 2,600 researchers and interdisciplinary scientists. NINR's contributions were highlighted through a special session, an award and an exhibit.

NINR director Dr. Patricia Grady chaired a special session titled “30 Years of Nursing Research: The Past, Present and Future of Nursing Science at the National Institute of Nursing Research.” She gave an overview of the institute's priorities and described how research can translate into policy. “Nursing research can address many health care challenges that nursing faces, including the need for more clinicians. Research can also help us better serve a population that is both aging and increasing in racial and cultural diversity,” she said.

In addition to commemorating the 30th anniversary of NINR, the institute also recognized



Dr. Pamela Hinds (l), Dr. Linda Aiken (c) and NINR director Dr. Patricia Grady

the contributions of two scientists it supports. Dr. Linda Aiken of the University of Pennsylvania has received 30 years of continuous funding from NINR. Her research has focused on how health policy can affect clinical outcomes. Aiken described how nurse staffing levels, education levels and work environment affect patient outcomes. This is a critical area of interest since work environments for nurses vary dramatically across the U.S.

Dr. Pamela Hinds of the Children's National Health System described her bereavement program

and intervention for families of children with a life-threatening or terminal illness. “Being a Good Parent to My Very Ill Child” aims to help parents define what it means to them to be a good parent at this difficult time. Hinds and her colleagues found that a sense of being a good parent helped parents make treatment decisions and ultimately cope with the loss of a child.

Each year at the meeting, AcademyHealth recognizes contributions to health services research and health policy. This year, NINR grantee Dr. Mary Naylor received the Distinguished Investigator Award. It recognizes investigators who have made significant and lasting contributions through scholarship, teaching, advancement of science and methods and leadership. Naylor developed the Transitional Care Model, an approach that seeks to improve care for community-based, older adults.

NINR also joined about 100 other exhibitors including publishers, government, universities and associations. NINR showcased materials such as research results and training opportunities.



Out with old, in with the new. The jet engine (l) that has efficiently generated power in NIH's Cogeneration Plant for the past 12 years was recently replaced with a more efficient model (r).

Cogen

CONTINUED FROM PAGE 1

than producing each form of energy separately. Because of its efficiency, the cogen plant produces electricity that's 60 percent less expensive than it would cost to purchase from the local electrical grid. Prior to the introduction of the cogeneration system, NIH bought all its electricity from Pepco, which currently burns mostly coal and some oil and gas in large power plants to produce electricity.

"Like its predecessor, this new engine will save us millions of dollars each year—savings that enable us to conduct more science than otherwise possible," said ORF Director Dan Wheeland.

The turbine engine fueled by natural gas is the heart of the cogeneration plant, which produces 23 million watts of electricity—enough to power 14,000 average homes in Maryland, Memarzadeh said. The plant meets approximately 35 percent of NIH's electricity requirement and provides 40 percent of NIH's steam production.

Purchasing natural gas for the cogeneration plant uses a unique strategy, developed and managed by DTR. The purchasing strategy helps NIH minimize exposure to seasonal short-term price spikes and maintains flexibility in order to take advantage of possible future natural gas price declines. Extensive analyses are performed daily to determine purchasing strategy. DTR employs highly advanced mathematical modeling based on an artificial neuron network in conjunction with Holt-Winter triple exponential smoothing that takes into account seasonal and trend changes. Based on the results of these models, DTR establishes a specific procurement plan for that period based on market conditions and

project economics. This strategy has saved NIH more than \$11 million in the last 12 years compared to the standard natural gas purchasing strategy.

Located near the center of campus, the 7,800-square-foot plant has been in operation since 2004. The original engine was a prototype built in Sweden and modified by Siemens and NIH. It sits next to the Central Utility Plant (CUP), which houses five traditional gas and oil-fired boilers. The original unit was one of the cleanest cogeneration plants in the world, with emissions 44 percent lower than similar plants operating without add-on emission controls. Since cogeneration was fired up in 2004, it has saved NIH more than \$50 million.

The CUP provides all of the campus's requirements for heating, cooling and humidity, while ensuring efficiency and reliability. It's one of the largest utility plants under one roof in the world. The amount of natural gas burned annually in the CUP is equivalent to 25 million gallons of gasoline. The total energy use (fuel and electricity) at NIH is equivalent to the energy used by 50,000 average Maryland homes. More than 10.5 million data points a day are collected and analyzed using 150,000 advanced calculations from about 1,600 continuously running analyses. Memarzadeh can see every data point and calculation on monitors in his office.

In the early 1990s, Memarzadeh and his colleagues were faced with a tough question: how does NIH meet increasing energy needs while reducing carbon emissions? They settled on cogen technology because it allowed them to meet the needs of a growing campus while reducing emissions.

"Farhad uses the pronoun 'we,' but the truth is his single leadership and understanding of complex systems are the reasons

this project is successful," said Wheeland. "He has done an exceptional job in overseeing a transformation of the plant."

The cogen plant reduces carbon dioxide (a greenhouse gas) emissions equivalent to removing 10,000 cars or 3,000 homes. In 2011, the Environmental Protection Agency awarded NIH the Energy Star Combined Heat and Power Award. "It's one of the cleanest cogen plants in the world," Memarzadeh said.

After 12 years and 100,000 hours of use, it was time to replace the old engine. He said the new engine "is the first of its kind to be installed in the United States." The newly upgraded turbine engine is a twin-shaft core engine, consisting of a gas generator plus a free-spinning power turbine.

The new engine improves on the overall unit design, combustion, hot gas path components and monitoring/protection. The upgrades will make the engine cheaper to run and maintain over its life. The new design will save NIH an estimated \$7 million a year in steam and electricity costs.

In addition to saving money and reducing carbon emissions, the cogen plant allows NIH to "continue critical operations should there be a regional power outage," added Wheeland.

Wheeland compared ORF staff to a touring rock band's road crew. If scientists are the rock stars, ORF staff "work behind the curtains" to make sure scientists have everything they need to conduct well-designed experiments.

"Without chilled water and steam—especially in the peak months of winter and summer—we wouldn't have patients, research animals and data centers,"

Wheeland said. **R**



Dr. Eugene Carstea

Carstea Appointed Chief of CSR Group

Dr. Eugene Carstea has been named new chief of the cardiovascular and respiratory sciences integrated review group at the Center for Scientific Review. He has been scientific review officer for CSR's molecular neurogenetics study section, the biophysical and physiological neuroscience fellowship study section and the molecular and the cellular neuroscience small business study section.

"Dr. Carstea has excelled as CSR's education and development coordinator for our scientific review officers," said CSR director Dr. Richard Nakamura. "We are pleased he will bring his tremendous leadership skills and policy insights to this important position."

As CVRS chief, Carstea will oversee 11 standing study sections and numerous special emphasis panels that review a broad range of NIH grant applications to fund research involving basic investigations, translational approaches and patient-oriented studies to advance understanding of the development, physiology and pathophysiology of cardiac and pulmonary systems.

Carstea received his Ph.D. in microbiology (molecular biology) from Clemson University. He was a senior research fellow within the Developmental and Metabolic Neurology Branch of the National Institute of Neurological Disorders and Stroke. He led his team in identifying NPC1, the gene (mutation) responsible for the inherited neurodegenerative disorder Niemann-Pick disease type C.

Following his work at NIH, he became scientific director at the Saccomanno Research Institute in Colorado. He then moved into the biotech/biopharma industry. Among his positions, Carstea was a principal scientist at Invitrogen Corp., designing novel research reagents and strategies associated with RNA interference. He later served as associate director of discovery at Vanda Pharmaceuticals in Rockville.

Jacobsen Named Associate Director of NCI Program

Dr. Paul Jacobsen has been named associate director of the NCI Division of Cancer Control and Population Science's Healthcare Delivery Research Program. He will be leading a team at NCI whose mission is to serve as a catalyst for the field of health care delivery research and to enhance data resources, measures and NCI's grant portfolio in this domain. He will also play a key role in NCI's collaborations with other agencies and organizations in health services and outcomes research.

Jacobsen comes to NCI from the Moffitt Cancer Center in Tampa, Fla., where he served as founding chair of its department of health outcomes and behavior and subsequently as associate center director for population science. Over the course of 30 years, his research has focused on patient-centered health outcomes, behavioral aspects of cancer prevention and detection and supportive care medicine. He has worked closely with the American Society of Clinical Oncology, the National Comprehensive Cancer Network and other organizations that influence how cancer care is delivered through their guidelines and educational activities. Based on his contributions, he was appointed to the ASCO quality oncology practice initiative steering committee, which oversees selection and



Dr. Paul Jacobsen

performance of the quality indicators used by practices for self-evaluation and reporting.

Dr. Robert Croyle, DCCPS director, said, "Dr. Jacobsen's recruitment reflects NCI's commitment to evidence-based medicine and increasing quality of care through better science."

Former NIAMS Executive Officer Bruun Mourned

Dr. Robert Lewis "Bob" Bruun, former NIAMS executive officer, passed away from complications of esophageal cancer on June 11 in Davis, Calif., surrounded by family. He was 73.

Bruun served for more than 22 years as a commissioned officer in the Public Health Service. Before joining NIH, he worked in a management capacity with PHS hospitals in Baltimore and Nassau Bay, Tex.

Former NIAMS administrative officer Melvin Broadus remembered, "His knowledge and mastery of the field of management was second to none. When he spoke, we listened."

Bruun graduated from Loyola University's School of Business Administration (Chicago) in 1965 and went on to earn an M.B.A. in health care administration from George Washington University in 1968. He received a doctorate in health services administration from Johns Hopkins University in 1980.



Dr. Robert Lewis Bruun

Bruun came to NIH in 1983, working as an associate administrator at the Clinical Center. In 1987, he was appointed EO at the newly established NIAMS. As the lead architect of NIAMS's initial administrative structure, Bruun helped guide NIAMS from its infancy to the institute it is today.

"Bob was very personable, a superb manager and very active in the NIH community," said Dr. Steven Hausman, former NIAMS deputy director.

In 1990, Bruun received the PHS Outstanding Service Medal for his work establishing the administrative management program at NIAMS.

Long-time friend and co-worker Nancy Middendorf said, "Bob cared. He cared about people, he cared about his work and he cared about his family. He put in long hours at work, but always balanced his time for his wife and young, growing family. Everyone liked and respected Bob. He had a wonderful sense of humor, which he often used to diffuse awkward situations, and he was a great storyteller. Even in his death, when I think of Bob, I get a big, warm smile from the inside out. He was my friend."

Bruun had a lifelong appreciation for international adventure. As a young man, he spent some time in Europe. He hitchhiked from Rome to Copenhagen and back with a sign reading "American college student." He also attempted to hitchhike across the Sahara desert.

Bruun is survived by Joanne, his wife of 45 years, and children Andrew, Matthew, Dan and Suzanne.—**Colleen Dundas**



Above, NIH'ers gather for the final Fill the Truck event in the Feds Feed Families summer food drive (PHOTO: BILL BRANSON). At right, Roxane Burkett of NHLBI shops for donations during the institute's "walk to Giant" activity, which garnered more than \$200 toward the effort (PHOTO: JOANNE DESHLER).



PARTICIPATION EXPANDED, RECORD BROKEN

6th Summer Food Drive a Success

BY COURTNEY BELL

For the sixth summer in a row, NIH staff donated non-perishable food items to the annual federal government food drive "Feds Feed Families." This year, NIH collected a total of 33,447 pounds, surpassing 2015's record of 26,315 pounds.

Food donated in the Bethesda area was directed to three organizations: the Capital Area Food Bank, and two familiar on-campus organizations, the Children's Inn and the Safra Family Lodge. Spike Harrison of the Office of Acquisition and Logistics Management served as donation team lead and travelled weekly to 52 donation boxes, picked up all items and prepared them for distribution. Volunteers sorted and set aside foods in high demand for inn and lodge residents.

NIH coordinator for the program Corey Welcher noted that the entire agency actively participated in the campaign from the Bethesda campus and beyond.



Dr. Craig Reynolds (l), NCI associate director, is one of the bosses "locked up," guarded by Dr. Jim Cherry until staff donate "bail" food items.

PHOTO: RICHARD FOLKERS

"I'm very happy to see a broader participation," she said. "Outside of the D.C. metropolitan area, NCI in Frederick, NIDDK in Phoenix, NIDA in Baltimore, NIEHS in Research Triangle Park and NIAID in Hamilton contributed almost 7,200 pounds to local food banks and homeless shelters in their respective areas."

Many individual offices and ICs took initiative by introducing competitions and unique events to raise awareness and donations.

ORS's Division of Occupational Health and Safety organized an intra-office competition that raised 1,090 pounds, while NIDDK instituted a "Battle of the Buildings" Team Challenge that brought in more than 1,740 pounds.

NHLBI's Office of Acquisitions at Rockledge combined its desire to do good with a workout by taking a "walk to Giant" as a team and purchasing items for donation. Leadership at NCI-Frederick really went above and beyond: Three bosses took part in a "Free Your Boss" event. Drs. Craig Reynolds, Joel Schneider and David Heimbrook were "locked" in their offices until staff raised "bail" of at least 50 pounds of donated food. Staff did not cruelly leave their bosses locked away and they'd raised 372 pounds by lunch.

ORS partnered with Eurest Dining Services for a second year on the successful "Fighting Hunger Vouchers" program.

Cafeteria customers could purchase \$1, \$3 and \$5 vouchers to go directly to purchase food for the drive. Sushi with Gusto, a vendor at the cafeterias, even offered a portion of its sales to purchase the vouchers. The program raised more than \$5,000, which was used to buy 7,500 pounds of food.

The campaign ended

on Aug. 31. Volunteers came out to encourage final donations with two "Fill the Truck" events on Aug. 30 and 31 outside Bldg. 1. Staff supported the program to the very end and are already thinking up ways to continue this year's success in 2017. Thanks again to all who participated in providing food to individuals in need.



Above, a view of the NHLBI Office of Acquisitions' "Fill the Fishbowl" initiative (PHOTO: CHRIS MILLS); Below, "Walk to Giant" teammates

