JULY 18, 2014
VOL. LXVI, NO. 15
The Second Best Thing About Payday

nih record

ABOVE • *Mindfulness, meditation can adjust the brain's "play" button. See story on p. 3.*

features

departments

NIH's Common Fund Celebrates Its First Decade

By Rich McManus

The 10th anniversary of NIH's Common Fund on June 19 provided an opportunity for current and past NIH leadership to explain the fund's origins and celebrate its achievements. The event in Masur Auditorium included videos provided by creative scientists supported by the fund and a performance, at day's end, by NIH director Dr. Francis Collins, of two fund-praisers: songs whose lyrics extolled the program's virtues.

Collins introduced the day-long research symposium, which presented "a rich array of the science, stretching from basic to clinical" conducted by fund grantees. Among the early speakers was 2012 Nobel laureate in chemistry Dr. Brian Kobilka of Stanford, who presented results of two CF-supported studies on G-protein

SEE **COMMON FUND**, PAGE 8

Former NIH director Dr. Elias Zerhouni (l) and current director Dr. Francis Collins

'Definitely Takes Your Breath Away'

Astronaut Hopkins Recounts 6 Months in Space

By Carla Garnett

Nothing can really prepare you for being in outer space. Sure, the months of simulations and other intense training can get you ready for space flight, but nothing on Earth can match the actual experience. That's what NASA astronaut Michael Hopkins told a Lipsett Amphitheater crowd June 10, as he described his voyage to the International Space Station.

NASA astronaut Michael Hopkins

"You can dream about it, you can think about it, but you don't know—until you actually experience microgravity—you're never really sure what it's going to be like," he said, describing his first moments

SEE **ASTRONAUT**, PAGE 6

NIH Tech Transfer Office Speeds Global Health Products

By Cathy Kristiansen

NIH and its partners are pursuing creative new ways to move biomedical innovations more quickly from publicly funded laboratories to developers to factories, so that patients in low-resource countries see their health improve, for instance via meningitis and rotavirus vaccines and more affordable HIV/AIDS treatments.

"We want to have an impact where we can, in areas of the world where the disease burden is heavy," said Steven Ferguson, deputy director of licensing and entrepreneurship in NIH's Office of Technology Transfer. "Diseases know no national boundaries and with globalization of living styles, we just have to have a global approach." OTT was established in 1989 to centrally manage technological innovations made by intramural scientists at NIH and FDA, including licensing, patents and royalties.

Three key changes jolted the status quo in how biomedical inventions are handled: new U.S.

SEE **TECH TRANSFER**, PAGE 4

The **NIH Record** is published biweekly at Bethesda, MD by the Editorial Operations Branch, Office of Communications and Public Liaison, for the information of employees of the National Institutes of Health, Department of Health and Human Services. The content is reprintable without permission. Pictures may be available upon request. Use of funds for printing this periodical has been approved by the director of the Office of Management and Budget through September 30, 2014.

To receive alerts to our latest issue, send an email to listserv@list.nih.gov with the words "Subscribe NIHRECORD" in the message body.

NIH Record Office Bldg. 31, Rm. 5B41
Phone (301) 496-2125 **Fax** (301) 402-1485

Web address http://nihrecord.nih.gov/

Editor
Richard McManus
Rich.McManus@nih.gov

Associate Editor
Carla Garnett
Carla.Garnett@nih.gov

Staff Writers
Dana Steinberg
Dana.Steinberg@nih.gov

Belle Waring
Belle.Waring@nih.gov

The **NIH Record** reserves the right to make corrections, changes or deletions in submitted copy in conformity with the policies of the paper and HHS.

NIH...Turning Discovery Into Health

nih record

briefs

Summer Poster Day Set, Aug. 7

Summer Poster Day 2014 is scheduled for Thursday, Aug. 7 at the Natcher Conference Center from 9 a.m. to 3 p.m. Summer Poster Day provides an opportunity for summer interns to share the research they have been conducting at NIH and at the same time develop communication and networking skills. Any summer intern (high school, college, medical/dental or graduate) working in an intramural research group at NIH this year may present. Investigators, staff scientists and scientific administrators can make a particularly important contribution to Summer Poster Day by visiting posters and engaging authors in discussion. For more information, visit https://www.training.nih.gov/summer_poster_day.

NEI Welcomes New Council Members

The National Eye Institute recently appointed two new members to its National Advisory Eye Council.

Dr. Steven McLeod is chair of the department of ophthalmology at the University of California, San Francisco. He specializes in refractive eye surgery, cataract and corneal disease. His research interests include the development of an intraocular lens to restore both near and far vision to patients undergoing cataract surgery. McLeod is on the editorial board of *JAMA Ophthalmology*.

Dr. Monica Vetter is chair of the department of neurobiology and anatomy and professor of ophthalmology at the University of Utah. Her research focus includes the role of microglia in neuronal decline and the definition of gene regulatory and signaling pathways in the birth of new neurons in the retina. Vetter is associate editor of *Developmental Dynamics*.

Katz Receives Lifetime Career Educator Award

NIAMS director Dr. Stephen Katz (r) was recently awarded the Dermatology Foundation's Lifetime Career Educator Award "recognizing an academic dermatologist who has a lifelong history of dedicated service as a mentor, role model and inspirational teacher to many generations of residents and fellows." Dr. Michael D. Tharp (l), the foundation's president, presented the award at its annual meeting in Denver. Katz's long-term work in NCI's Dermatology Branch has focused on keratinocytes and Langerhans cells, elucidating their roles in immune function and inflammation in the skin. Within the last several years, he has worked to determine why skin becomes a target for immune reactions and yet remains resistant to long-term damage. Katz says that teaching has been "tremendously satisfying and gives me great joy," and he takes pride in "developing a core of scientists who went on to develop their own independent leadership positions in the U.S. and around the world." A former mentee agrees that Katz should be recognized by the foundation with the Lifetime Career Educator Award, saying, "His curiosity, enthusiasm and lifelong commitment to science and scholarly activities have had a profound and durable impact on his trainees and the specialty in this country and others. His candle has lit many fires."

Adjusting the Brain's 'Play' Button

Jha Discusses Potential of Mindfulness to Counter High Stress

By Ellen O'Donnell

Imagine that you own a media player constantly stuck on "previous" or "fast forward." It would be hard to experience your favorite music in real time without being able to just hit "play."

"I think of the brain as like an MP3 player," Dr. Amishi Jha said in a recent talk in Lipsett Amphitheater, part of NCCAM's Integrative Medicine Research Lecture Series. She added that, for many people (especially under stress), the mind is largely occupied reliving the past or anticipating the future, which makes it difficult to fully experience the present and meet its demands. An associate professor of psychology at the University of Miami, she discussed the growing evidence base on a strategy that could help the brain stay on "play" longer: mindfulness meditation.

Study results are suggesting, Jha said, that learning and practicing this form of meditation can help reduce, even prevent, the degradation of the brain's cognitive control systems—e.g., those related to attention, working memory, emotion regulation and mind-wandering—seen with prolonged periods of high stress. Mindfulness training may also promote psychological health, well-being and resilience, she added.

Jha highlighted several controlled pilot studies conducted by her team in a population that epitomizes high stress: military service members and their spouses. One study recruited a group of Marine reservists preparing for deployment. Half received 8-week training on mindfulness meditation and logged the amount of time (up to 30 minutes daily) they spent practicing outside class. The other half served as a comparison group and did not receive training.

Across two published studies, outcomes were working memory, positive and negative mood and mind-wandering, as well as self-reported measures of mindfulness as a mental state, and of perceived stress.

The researchers found that those in the mindfulness training group who practiced the most outside class had greater increases in working memory, positive mood, as well as significant decreases in negative mood and mind wandering. These benefits were not seen in those in the training group who logged lower amounts of practice time, nor in the no-training comparison group. The training group also described acquiring other skills and benefits from the training, such as improvements in family life and the ability to focus.

At left, meditators practice their discipline. At right, Dr. Amishi Jha and Brig. Gen. Walter Piatt review brain-wave recording procedures and a memory test taken by military service members before and after mindfulness training.

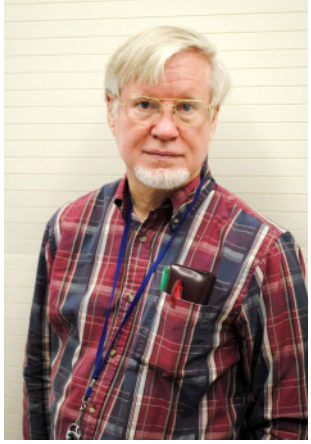
PHOTO: BOB STOCKFIELD (OF MEDITATORS)

Jha is also studying mindfulness training in the military-spouse population (here, compassion training is added as a component). Results are not yet published, Jha said, but are encouraging.

"Data are amassing that show clinical and public health consequences from high stress," she said. "They include a whole host of psychological, long-term, potentially lifelong disorders, unless appropriate treatment can be applied." Not only serving in the military, but also expecting a new baby, caring for an elderly and/or sick family member or receiving a major medical diagnosis oneself are all examples of potent stress contexts, Jha said. "And the overarching question is, can mindfulness protect and strengthen the capacities at risk for being degraded due to such contexts?"

The lecture is available at http://videocast.nih.gov/Summary.asp?File=18418&bhcp=1. NCCAM also has a mindfulness portal at http://nccam.nih.gov/taxonomy/term/228.

NHLBI's Knepper Receives Berliner Award



The renal section of the American Physiological Society has named Dr. Mark A. Knepper as the 2014 Robert W. Berliner Awardee for Excellence in Renal Physiology. Knepper is a senior investigator in NHLBI's Intramural Program and head of the Epithelial Systems Biology Laboratory. In 1978, he was recruited as a staff fellow to NHLBI's Laboratory of Kidney and Electrolyte Metabolism.

An internationally recognized leader in renal physiology, Knepper has made extensive contributions to the field of vasopressin signaling in the renal collecting duct, where he has defined novel pathways for the regulation of aquaporins, urea transporters and sodium transporting proteins. He has published more than 400 peer-reviewed papers, in addition to book chapters on renal physiology, hypertension, nephrology and systems biology. He has also been a strong advocate for mentoring future renal physiologists as demonstrated by his many trainees who now hold leadership positions in physiology and nephrology at various institutions across the world. Knepper received a B.S. in chemical engineering from the University of Michigan in 1970, before attending Case Western Reserve University and receiving his Ph.D. in biomedical engineering (1975) and an M.D. (1976).

TECH TRANSFER

CONTINUED FROM PAGE 1

technology transfer legislation, more favorable licensing agreement terms and the rise of global partnerships to steer products through development to low-resource markets.

Developing a new compound usually costs hundreds of millions of dollars and is fraught with risk, Ferguson noted. He compared the typical path for an innovation born at a U.S. government laboratory bench until it reaches the bodies of humans with the three-stage launch of a rocket. In the initial stage, scientists come up with a new compound or technique, such as a chemical that kills the parasite responsible for river blindness or a protein that induces a strong immune response to an influenza virus, and they test it for safety in animals or even in a few dozen people.

In the second stage, a biotechnology company—often a startup or pharmaceutical firm—acquires permission to make its own products using the technology. It conducts development often up to phase 2 clinical trials in perhaps 200 people to test for efficacy and side effects. Although NIH intramural scientists may not commercialize products themselves due to conflict of interest rules, they may help others with the basic or clinical research as part of their official duties. NIH-funded recipients outside government, such as universities, own the technology they invent and may develop it themselves or transfer it.

Finally, the biotech company—or an interested pharmaceutical firm that acquires the technology rights, sometimes by purchasing the smaller company—conducts large phase 3 trials involving 1,000-3,000 people. These are costly and must demonstrate that the product is safe and improves health to garner regulatory approval.

"There's developmental risk, financial risk and regulatory issues, particularly on novel approaches," Ferguson said. Against all this, the developing and emerging country markets might be small and the price charged must be low enough to be affordable, he noted. "The risk, on top of something that perhaps doesn't have a very strong market in Western countries, makes for a difficult overall proposition for development."

But more economical biotechnology products are now finding their way to low-resource settings. "We are doing more and more licenses at non-U.S. companies," Ferguson said. "It is a relatively small number of agreements, about 300 so far including those completed in non-U.S. Western countries, but they have a huge health impact. This will make a real difference from a global health perspective, especially for the several dozen to date done directly in emerging or developing countries."

***Right**:*
NIH staff scientists are finding creative ways to steer new technologies from discovery to development to delivery of vaccines and drugs to low-resource countries.

PHOTO: NIAID

The trigger for a proactive approach to technology transfer at NIH was a change in U.S. legislation. In the past, the government retained the rights to all technology produced by both NIH and NIH-funded scientists. But rather than attracting developers to make products and share revenue with the government, most technology gathered proverbial dust on the shelf. So Congress passed legislation in 1980 to require the formation of formal technology transfer offices and programs at both federal labs such as NIH and at government-funded institutions. The Bayh-Dole Act allows extramural government-funded grantees to hold the rights to their innovations and the similar Stevenson-Wydler Act enables agencies to own and manage their intramural innovations.

But even with more favorable conditions for transferring ideas out for development, many new products were still beyond the reach of many country budgets. So in recent years, NIH and other public and private organizations have partnered to bridge this gap, negotiating more favorable licensing and manufacturing agreements, raising funds to purchase vaccines and drugs and securing government collaboration in developing countries.

This has triggered a surge in new products using technologies licensed by OTT—more than 600 across all markets to date. One is the meningitis A vaccine. The NIH OTT licensed the vaccine conjugation technology developed intramurally at FDA to the nonprofit PATH, which teamed up with WHO to set in motion production of the vaccine at a prearranged price. In another case, OTT transferred vaccine

technology to South Korea's International Vaccine Institute for a typhoid vaccine produced in Indonesia and India for Asian populations. Also, the nonprofit GAVI Alliance was formed to bring low-cost vaccines to global populations via negotiations on technology transfer, manufacture and sale of these products. It garners funding from international organizations, donor governments, philanthropic groups and the pharmaceutical industry.

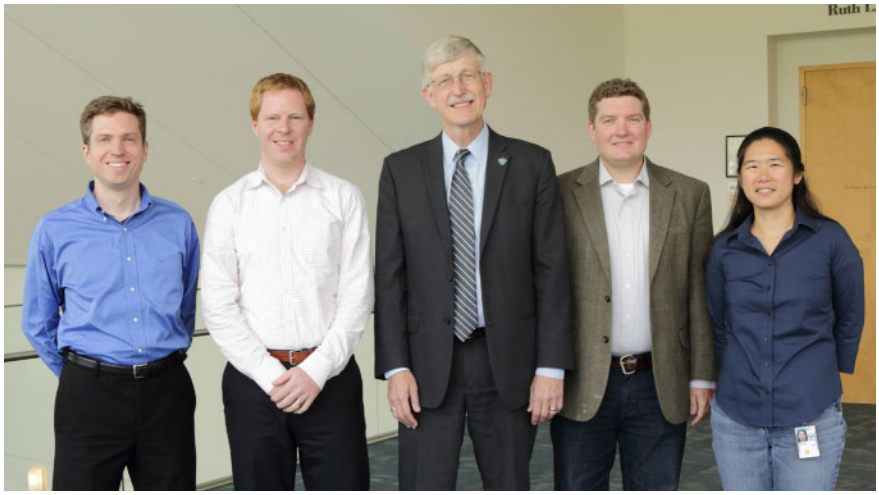
In another approach supported by the President's Emergency Plan for AIDS Relief for HIV/AIDS, FDA introduced a special licensing agreement for generic antiretrovirals to be produced and sold in developing countries, while upholding the brand-name drug's patent protection at home. These cheaper drugs mean millions more patients can access lifesaving treatment.

The changing face of technology transfer carries several risks from the corporate perspective, not least in opening up an alternative supply chain of drugs that could filter back into developed countries and threaten sales of pharmaceutical companies there, Ferguson noted. And enforcement of intellectual property rights is weak in some countries, eroding the willingness of a company to pour money into drug development if their findings might be snatched by another firm. But, he said, "That's all been changing."

For its part, NIH's OTT and technology transfer staff in the institutes and centers are raising global awareness of intellectual property and technology transfer issues by sending trainers as part of NIH or other federal agency programs to a number of low- and middle-income countries. In addition, OTT offers a mentoring program in technology transfer on the NIH campus for officials from foreign research institutes or government agencies.

OTT currently holds rights to nearly 8,000 inventions and has licensed technology relevant to diseases such as HIV/AIDS, malaria, dengue, rotavirus, meningitis and typhoid fever. License negotiations are completed or ongoing with a growing number of public and private institutions in India, Mexico, Brazil, China, Korea, Egypt, Argentina and South Africa.

"We are finding a home for the technology where the real need is, where it can have a large public health impact," Ferguson noted. "It has been really exciting to see this level of interest and activity, where 10 years ago we had almost none."



NIH director Dr. Francis Collins (c) meets with third-year PRAT fellows (from l) Dr. Kentner Singleton, Dr. Karl Erlandson, Dr. Stephen Parker and Dr. Christine Jao.

PHOTO: BILL BRANSON

Collins Addresses Postdoc Program Graduates

In a keynote address to the graduating class of NIGMS Postdoctoral Research Associate (PRAT) fellows on June 2, NIH director Dr. Francis Collins shared a personal story few may know: He nearly passed up the offer to lead the Human Genome Project. Collins urged the 46th class of PRAT fellows not to shy away from leadership opportunities, as he almost had.

"Your community may need you," he told them. "You have exceptional talents."

Following the address, the third-year fellows presented their research on topics ranging from viral drug resistance to the genetic control of autoimmune responses.

PRAT fellows work with intramural investigators who provide intensive mentoring. Collins is a mentor himself, to Dr. Stephen Parker, one of the four graduating fellows.

Despite Collins' many commitments, Parker said the NIH director is fully engaged in his preceptor role. "When you talk to him, you feel like you're the most important person to him at that moment. [Later] he would remember some little detail about my research that I told him months before, and remind me of it."

According to Dr. Jessica Faupel-Badger, who directs the PRAT program, "This class of fellows joins a long list of distinguished PRAT alumni, many of whom have achieved senior leadership positions in academia, industry and government. I look forward to seeing where our newest alumni make their marks."

More information about the PRAT program is available at www.nigms.nih.gov/Training/Pages/PRAT.aspx.

ASTRONAUT

CONTINUED FROM PAGE 1

***Above, from l**:*
Hopkins engages in "daily life" aboard the International Space Station—routine maintenance on the facility. Here, he works on the COLBERT treadmill in the Unity node of the station. He replaced a failed accelerometer in the exercise device.

***Down to Earth**. Hopkins presents a poster of expedition 37/38 images to Dr. Stephen Katz, director of NIAMS, which hosted the astronaut's visit.*

***Below**:*
Before his talk in Lipsett, Hopkins and NASA colleagues including Dr. Victor Schneider (r), research medical officer at the agency's Biomedical Research and Countermeasures Program, met with several NIH scientists.

NIH PHOTOS: ERNIE BRANSON
SPACE PHOTOS: NASA

off the planet. "When that third-stage rocket shuts off, you're in space. You're in orbit. You're in microgravity. You kind of get thrown forward a little bit in your [safety] straps. At that point, I felt like I was falling. So if everyone was to hang onto the ceiling and then let go, that's what it felt like…It's a little weird, a little different. But eventually your body does adjust."

From Sept. 25, 2013, to Mar. 10, 2014, Hopkins served as a flight engineer aboard the space station during expedition 37 and 38. It was Hopkins's first trip into space. He trained for about 2½ years, the typical prep time for space travel. When launch day finally arrived, Hopkins said he felt relief more than anything else.

"This is a big moment for any astronaut," he said, describing liftoff of the small, cramped Russian Soyuz capsule atop its launch vehicle.

From departure in Kazhakstan, the crew took about 9 minutes to reach orbit. Six hours later, their vessel docked with the space station. With leak checks and pressurization, it would be an additional hour and a half to 2 hours before the hatches could be opened and the 3 new arrivals could float from the spacecraft toward the 3-member crew already living on the station.

Roughly the size of a football field with living quarters comparable to a 4- or 5-bedroom house, the space station is about 240 miles above Earth.

An engineer and a U.S. Air Force colonel, Hopkins said daily life on the station typically consists of three activities: routine maintenance on the facility—"If the toilet breaks, everything else stops until it's fixed," he quipped; physical exercise for at least 2 hours a day; and the scientific research that is the expedition's primary goal.

"We had some ants come up with us for a science experiment to see how they behave in space," Hopkins said, "and then there's a lot of experiments where we're the guinea pigs. We do a lot of experiments on ourselves as well." During his trip, his crew also handled a few unusual tasks:

- A relay of the 2014 Winter Olympic torch—This event prompted accommodation of 9 people aboard the space station at one time. Three new crew members delivered the torch; 4 days later the departing crew delivered it back to Earth.

- Christmas Eve spacewalk—Hopkins went on a couple of unscheduled spacewalks to repair a malfunctioning cooling unit outside the station. Add in the need to maintain secure footing outside on the station's robotic arm as well as work with potentially hazardous ammonia that the coolant unit uses and Hopkins logged quite a bit of excitement.

Another activity—gazing out of the station's glass cupola—occupied quite a bit of free time. Otherwise mundane, looking out the window has new meaning at 240 miles above Earth.

"It definitely takes your breath away," Hopkins said. "It's something that never got old for the 166 days that I was in space."

Hopkins's talk was hosted by NIAMS, which along with NIA and NIBIB, works with NASA to conduct research about the effects of space travel on the human body. According to NIAMS director Dr. Stephen Katz, NIH and the space agency have a long history of collaboration dating back to the 1960s and Project Gemini, which was the second human space flight program.

"When the Space Shuttle Program was active, NIH intramural and extramural researchers developed dozens of experiments for 11 missions, including the famed Neuro Lab in 1998," said Katz. Currently three basic research projects are under way, employing the space station's microgravity environment to explain how gravity influences cell behavior on Earth.

"As anyone who's watched astronauts returning from their missions knows," Katz noted, "when it comes to NIAMS, space travel takes a real toll on the musculoskeletal system—not only muscles, but also bones…the national laboratory of the International Space Station provides a virtually gravity-free environment that can unmask cellular and molecular mechanisms."

Before Hopkins spoke in Lipsett, he and several NASA colleagues met with Katz and some of the NIH scientists who collaborate on projects with the space agency. Following the 25-minute video journal of his venture into space, Hopkins took audience questions.

How does food taste up there? Overall, he said, foods taste the same as they do on Earth, only blander. Space travelers, he explained, often experience nasal congestion and other mild allergy-like symptoms, which can affect the tastebuds.

"Fluids shift," Hopkins said. "You don't need as much fluid up there…In general things taste the same, but with your nose stopped up you don't get the exact same taste. We tend to use a lot of hot sauce to spice things up."

How does TV portrayal of space stack up to reality? "I definitely see shows with more of a critical eye," he joked.

With 9 people aboard the space station at one time, cool starburst photo ops are possible. Above, Hopkins, at the 3 o'clock position, poses with colleagues last winter.

When his world view changed, did his World View change? "Absolutely," he replied. "You don't see borders up there…You appreciate the little things. It's always 75 degrees with no wind and no rain. It's the small things you miss, like feeling a breeze."

What advice would he give to kids dreaming of spaceflight? A father of two boys himself, Hopkins concluded, "Astronauts come from all walks of life…Find something you're passionate about." Adding that he applied 4 times during 13 years before his eventual acceptance to go on a NASA mission, Hopkins said, "Never give up."

The full presentation is online at http://videocast.nih.gov/summary.asp?Live=14298&bhcp=1.

Children's Inn Launches Partnership with NASA

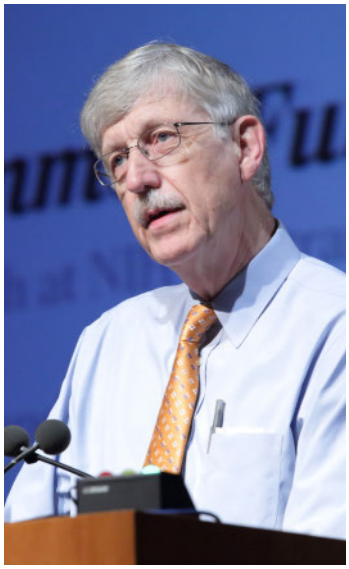
"How do you shave in space?" was just one of the questions asked of NASA astronaut Michael Hopkins when he met with youngsters and their families at the Children's Inn at NIH on June 10. Other things kids wanted to know included: "How do you tie your shoes in space?" "What if you get sick when you are up there?" "Is there a microwave on the space station?" The visit from the astronaut was part of a new partnership between the inn and NASA headquarters.

Hopkins launched into space with two Russian cosmonauts last September. They docked with the International Space Station and spent the next 166 days in space, performing science experiments and conducting spacewalks to make repairs to the station. During the expedition, the crew orbited the earth 2,656 times and traveled more than 70 million miles. "We saw the sun rise and set 16 times a day," said Hopkins.

Performing everyday tasks like shaving and brushing one's teeth poses a number of challenges in zero gravity. The inn families heard not only about how the astronauts shaved in space, but also how they brushed their teeth, drank coffee and how they kept clean without being able to take a shower for several months. They learned about what the food is like on the space station (lots of dehydrated burritos and mac and cheese, and no fresh fruits and vegetables) and how easy it is to lose things when you lack an "up and down" orientation. Hopkins also talked about the biomedical research they do while in space—learning how to prevent bone loss during extended space travel can help shed light on preventing bone loss among elderly people here on Earth.

"We are looking forward to more astronaut visits," said Laura King, director of volunteers and community outreach at the inn. "We also have a range of other activities planned, including an outdoor lighting 'shooting stars' display during the holiday season, a NASA star-gazing activity using telescopes, science and space-related educational activities at Camp InnCredible and guided tours for our families of NASA Goddard Space Flight Center and the National Air and Space Museum."

NASA astronaut Michael Hopkins drops by the Children's Inn.



COMMON FUND

CONTINUED FROM PAGE 1

***Above, from l**:*
Dr. Betsy Wilder, who has been with the Roadmap/Common Fund from the start, called it "a really amazing trans-NIH set of programs."

Dr. Dushanka Kleinman said that launching the program was "exhilirating, frightening and extremely rewarding."

Collins called the program "a wonderfully successful experiment."

PHOTOS: ERNIE BRANSON

Zerhouni rallied both scientific and political support for the Common Fund.

coupled receptors; such receptors account for more than 40 percent of all pharmaceutical industry research expenditures, he said.

"It has been a pleasure and a privilege over the last 5 years [since he became NIH director] to see this program develop," Collins said. Originally known as the Roadmap for Medical Research when it debuted in fall 2003, the effort began out of "a need to support science that doesn't fit cleanly into the portfolio of any one of the 27 institutes and centers," he explained.

"This was Elias's brainchild," said Collins, before introducing former NIH director Dr. Elias Zerhouni, whom he called "the father of this whole enterprise we're celebrating today…He convinced people to open their wallets—and that's not an easy thing to do around here. Tin-cupping [asking the ICs for voluntary contributions] was not going to work, and it was Elias's crucial scientific and political skills" that made the Common Fund a reality.

Collins outlined four major Common Fund accomplishments:

- Molecular libraries: Beginning in 2004 with a small-molecule screening program, the effort by 2014 has identified 390,000 unique and diverse compounds, resulted in 132 patented discoveries and found 365 probes, 7 of which are now in clinical development.

- Microbiome Project: Launched in 2007, it builds on the surprising discovery that, in every human being, there are more of "them" than "us"—microbes outnumber human cells by at least 10 to 1. "That made us realize that we really are an ecosystem," Collins noted, "and has become an international effort."

- The Patient Reported Outcomes Measurement Information System (PROMIS), a system of assessment tools that measure patient-reported health status, began in 2004. Collins called its web site (www.nihpromis.org) a rich collection of resources.

- High-risk, high-reward NIH Director's awards under Early Independence, New Innovator, Pioneer and Transformative Research categories. Collins said a new study has shown greater productivity from Pioneer Award winners than from those who earn traditional R01 grants. One-third of the Common Fund budget now goes to these awards, he said. Scientists funded by the awards provide "wonderful topics for my blog," Collins added.

"A remarkably complex array of programs are now supported by the Common Fund," Collins concluded, lauding the CF as "our venture capital space…From my perspective, this has been a wonderfully successful experiment…It has also led to rich collaborations across the institutes and centers that would not otherwise have occurred."

Zerhouni, who is now president of global research and development at Sanofi, recounted how he had been recruited as NIH director from Johns Hopkins in 2002. "Within a week of my appointment, people were saying, 'Zer-who?' I thought I better come up with something to get some respect around here," he quipped.

Convinced that "NIH needs to be a leader in where science is going," Zerhouni recounted an intense summer of recruiting outside advice about how NIH could surmount barriers to scientific progress; the experience "told me there was a pent-up demand for leadership from NIH."

Zerhouni said he was especially disinclined to go before Congress just to say, "Thanks for the doubling" [of the NIH budget, which occurred 1998-2003]. He was determined to excite Congress with a case built on scientific opportunity and a conceptual focus that became the Roadmap.

Zerhouni said he will write someday a detailed account of how his Roadmap vision was eventually embraced in legislation reauthorizing NIH in 2006—it won passage in a 2 a.m. vote—and insisted that the Common Fund "is not mine, and it's not Francis's, it's ours." The Common Fund has had global impact, he added: "There isn't a country I go to that doesn't mention it. NIH did good."

A videocast of the entire symposium is available at http://videocast.nih.gov/summary.asp?Live=13974&bhcp=1.

milestones

NaDel Griffith retired from CSR after 31 years at NIH.

CSR Administrative Branch Chief Griffith Retires After 31 Years

By Paula Whitacre

NaDel Griffith joined NIH as an office automation clerk in 1983, assuming she would stay in the Washington area for a few years until her husband's job with the Navy moved them someplace else. Thirty-one years later, she retired as chief of the Center for Scientific Review's Administrative Services Branch in May.

She began at NINCDS (now NINDS) and moved to the Division of Research Grants (now CSR) in 1989 as part of the STRIDE career development program.

"We had 100 applicants for the position, but NaDel stood out," recalled Patricia Bailey, then chief of DRG's Office of Administrative Management. On Griffith's first day on the job, Bailey handed her a thorny task involving an irate senior-level employee who insisted there was an error in his paycheck. "It was a busy time, and I just gave it to her to solve," said Bailey. "It took her a few hours, but she did."

Griffith moved from administrative assistant, to officer, to chief of the branch in 1997 when Bailey retired. While the branch is responsible for procurement, travel and many other responsibilities, the milestones that stick out for Griffith as she looks back at her career involve space management. In the mid-1990s, she was responsible for the division's move to Rockledge Dr., working with GSA from initial solicitation to the move of more than 400 people. Ten years later, the lease was renegotiated and she was in charge of a complex, 10-phase renovation. She also is proud that she set up a lactation room, now open to all federal employees in the Rock Springs area, as well as a small fitness facility for CSR staff.

"This is the type of job in which you have a lot of balls up in the air," said Chris Wisdom, former CSR executive officer who selected Griffith for the position as chief. "NaDel is a superb juggler."

To Griffith, branches like hers contribute to the overall mission of NIH. "NIH is the premier biomedical institution in the country," she said. "We provide the services that allow the scientists to do their work and carry out their mission."

Griffith credits Bailey and Wisdom for their guidance as she moved up at CSR, and notes that she completed her bachelor's degree at Wisdom's urging. In turn, Griffith has mentored many interns and others in her branch. Her advice is the same that she follows herself: "Volunteer if anything comes up, whether a special project or just to help out in the interim. You're helping someone who has a need and you are learning."

Griffith grew up in Eclectic, Alabama. She explained her first name is a combination of her mother's and grandmother's names. She has two adult children with whom she hopes to spend more time when she retires—a daughter who is a physical therapist in Fairfax and a son who is a basketball coach in Miami. She and her husband plan to build a house on the coast in Georgia in the next few years. However, as she admitted, if her move to Washington is any indication, they may not get there for a while.

ORIP Names Chang as New Deputy Director

Dr. Michael C. Chang has been named deputy director of the Office of Research Infrastructure Programs within the Division of Program Coordination, Planning, and Strategic Initiatives.

He began his NIH career in 1992 as a staff fellow in NIA's Laboratory of Neuroscience, where he was instrumental in the development of an *in vivo* method to quantitatively study brain lipid metabolism to elucidate functional integrity and structural state of the brain under normal and pathological conditions. In 2000, Chang joined the NIH extramural program in the Division of Comparative Medicine, where he was responsible for planning and directing a portfolio of grants, contracts and cooperative agreements supporting research and programs that develop and broaden the utility of non-mammalian models, including cell cultures and non-biological systems.

Chang's successes in DCM include his leadership of the Aquatic Models Research Resource Consortium. In addition, he led the development of an initiative to support research to address long-standing bottlenecks to cryopreservation of sperm at the Zebrafish International Resource Center.

He received his Ph.D. from the University of Toronto in zoology/neuroscience and completed a postdoctoral fellowship at the State University of New York at Buffalo, in the department of anatomical science (1989-1991).

"I am delighted to have Dr. Chang serving in this new capacity in ORIP. His long-term experience and insight with all ORIP programs, his creative leadership style combined with his strong management and communication skills will be a great asset to ORIP's future development," said ORIP director Dr. Franziska Grieder.

digest

From right, researcher Dr. Steven Russell of Massachusetts General Hospital stands with Frank Spesia and Colby Clarizia, two participants in a type 1 diabetes trial testing an electronic device called a bionic pancreas—the cellphone-sized device shown—which replaces their traditional fingerstick tests and manual insulin pumps.

PHOTO: ADAM BROWN, DIATRIBE.ORG

Bionic Pancreas Outperforms Insulin Pump

People with type 1 diabetes who used a bionic pancreas instead of manually monitoring glucose using fingerstick tests and delivering insulin using a pump were more likely to have blood glucose levels consistently within the normal range, with fewer dangerous lows or highs. The full report of the findings, funded by NIDDK, appeared online June 15 in the *New England Journal of Medicine*.

The researchers—at Boston University and Massachusetts General Hospital (MGH)—say the process of blood glucose control could improve dramatically with the bionic pancreas. Currently, people with type 1 diabetes walk an endless tightrope. Because their pancreas doesn't make the hormone insulin, their blood glucose levels can veer dangerously high and low. Several times a day they must use fingerstick tests to monitor their blood glucose levels and manually take insulin by injection or from a pump.

In two scenarios, researchers tested a bihormonal bionic pancreas, which uses a removable tiny sensor located in a thin needle inserted under the skin that automatically monitors real-time glucose levels in tissue fluid and provides insulin and its counteracting hormone, glucagon, via two automatic pumps. In one scenario, 20 adults wore this device combination and carried a cell phone-sized wireless monitor around Boston for 5 days, unrestricted in their activities. In the other, 32 youth wore the device combination for 5 days at a camp for children with type 1 diabetes. Both groups were also monitored for 5 days wearing their own conventional pumps that deliver insulin.

"The bionic pancreas system reduced the average blood glucose to levels that have been shown to dramatically reduce the risk of diabetic complications," said co-first author Dr. Steven Russell of MGH. "This is tremendously difficult with currently available technology, and so most people with diabetes are unable to achieve these levels."

Telemedicine Catches Blinding Disease in Premature Babies

Telemedicine is an effective strategy to screen for the potentially blinding disease known as retinopathy of prematurity (ROP), according to a study funded by NEI. Investigators say the approach, if adopted broadly, could help ease the strain on hospitals with limited access to ophthalmologists and lead to better care for infants in underserved areas of the country.

The telemedicine strategy consisted of electronically sending photos of babies' eyes to a distant image-reading center for evaluation. Staff at the image-reading center, who were trained to recognize signs of severe ROP, identified whether infants should be referred to an ophthalmologist for evaluation and potential treatment. The study tested how accurately the telemedicine approach reproduced the conclusions of ophthalmologists who examined the babies onsite.

"This study provides validation for a telemedicine approach to ROP screening and could help save thousands of infants from going blind," said Dr. Graham Quinn of Children's Hospital of Philadelphia and lead investigator for the study, which was reported June 26 in *JAMA Ophthalmology*.

Researchers Extend Liver Preservation for Transplantation

Researchers have developed a new supercooling technique to increase the amount of time human organs could remain viable outside the body. This study was conducted in rats; if it succeeds in humans, it would enable a world-wide allocation of donor organs, saving more lives.

The research is supported by NIBIB and NIDDK.

The first human whole organ transplant 60 years ago—a living kidney transplant—changed the landscape of the medical world. Since then, transplants of skin, kidneys, hearts, lungs, corneas and livers have become commonplace. But due to a shortage of donor organs, more than 120,000 patients are still on waitlists for organ transplantation in the United States alone.

The difficulty with long-term preservation of human organs stems mostly from the extensive tissue damage that occurs when organs are cryopreserved, frozen at temperatures of -320.8 degrees Fahrenheit. While freezing is successful for single cells and simple tissues, the problem is exacerbated with whole organs because of the multiple cell types and other structures that react differently to cold. To combat these problems, Dr. Martin Yarmush and Dr. Korkut Uygun of the Center for Engineering in Medicine at Massachusetts General Hospital have developed a 4-step preservation technique that has tripled the amount of time that rat livers can be stored before transplantation.

The researchers described their process in the June 19 online issue of *Nature Medicine*.—**compiled by Carla Garnett**

feedback

Have a question about some aspect of working at NIH? You can post anonymous queries at www.nih.gov/nihrecord/index.htm (click on the Feedback icon) and we'll try to provide answers.

Feedback: We decided that we would attend Take Your Child to Work Day at NIH as a family. While the activities were well done, there was an issue with the cafeterias. My husband has celiac disease and cannot have gluten and also has diabetes. I thought the 10/B1 cafeteria was offering gluten-free bread upon request with their sandwiches. Well, the sandwich ladies had no idea what we were talking about. We asked one of the managers, who knew nothing, who went and asked the head chef, who stated "there are no gluten-free foods today." They were of no help whatsoever. Even the salad bar looked like a disaster area with massive cross-contamination between the different items. He eventually found a pre-packaged salad at the cafe in the CRC atrium, but by then his blood sugar was quite low—any lower and he would have needed a trip to OMS. One would think that at the NIH, the cafeterias would be more cognizant of employees, patients and visitors with special dietary needs. Don't you think it reflects badly on the NIH when someone comes for a visit and cannot even eat at the cafeteria because they refuse to accommodate special dietary needs? Do you realize that in-patients at NIH get better food, specialized food, healthy food, while the rest of the NIH population has to deal with the unhealthy junk that the cafeterias serve?

Response from ORS: The Office of Research Services, Division of Amenities and Transportation Services (DATS) has the responsibility for oversight of all NIH campus cafeterias and convenience stores. We apologize that you did not have a pleasant experience in the 10/B1 café during Take Your Child to Work Day. However, with an additional 3,000 customers, that was not a typical day in any of the campus cafeterias.

All of our food providers are committed, to the best of their abilities, to supporting and attending to the different dietary needs of our customers, such as celiac disease. For example, Eurest Dining Services regularly takes extra precautions when offering foods that are gluten-free. Unfortunately, Eurest was concerned that the vendor who was supplying their gluten-free products was not adequately addressing the issue, so they removed them recently from the 10/B1 café—thus the reason there was not any gluten-free bread available. We apologize that this was not communicated correctly to you and your family when you visited the café. Eurest is currently sourcing another vendor to provide a "made without gluten" pre-packaged bread item that we feel will be better for our customers.

We did want to point out that since all of the kitchens do handle products with gluten, any food that is unpackaged and handled in those kitchens is no longer considered "gluten-free." We understand the importance of correctly advertising this type of information, as it could have a significant impact on our customers, their family member or our patients' health.

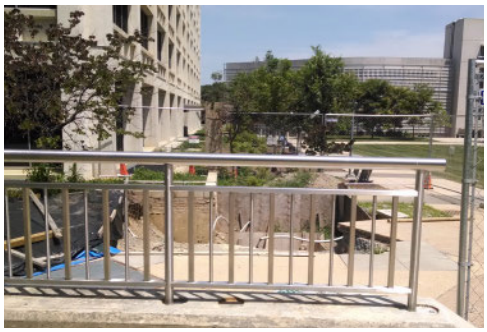
DATS works closely with all its food services contractors, in conjunction with a number of the institutes and centers, to improve the offerings and nutritional selections available in our cafeterias. In addition, Eurest employs a registered dietitian dedicated to NIH operations. If any NIH employee or patient would like assistance in identifying foods that meet their specific needs, we would encourage them to make an appointment with the Eurest on-site registered dietitian, Beth Dorman (beth.dorman@compass-usa.com).

Please note that other healthier food choices may also be found through Eurest's Balance program, which includes entrees that meet established guidelines in sodium, fat and calories. Also, Eurest annually provides outreach tables in all the cafeterias staffed by NIH registered dietitians to answer questions from our over 20,000 daily customers. There are also periodic chef-led demonstrations on healthier recipes that Eurest can make available upon request.

Feel free to subscribe to the Food Services listserv (www.ors.od.nih.gov/pes/dats/food/Pages/foodlistserv.aspx) and follow our NIH Employee Services Twitter page (@NIHEmplSrvcs) where we offer newsletters, nutrition news, upcoming events and announcements.

Feedback: What's the mysterious smoke emanating from a giant hole outside of Bldg. 31C? The area stays fenced off, and every so often workers come and peer down at whatever's smoldering, but there's never a resolution and repair of the hole.

Response from the Office of Research Facilities: The smoke is actually steam coming from a break in the piping that supplies the utility to all heating equipment in 31C. The Office of Research Facilities could not conduct repairs in the winter, because in order to do so, the utility would need to have been taken offline and the steam was needed to heat the facility, maintaining safe use, operation and no interruption for the occupants. ORF enters the fenced area regularly to closely monitor the break for further failure and to ensure that the pumping system removing any water from the hole and around the piping is working correctly and maintaining a safe level.



Now that summer has arrived, ORF has scheduled repair to the system during the months of July and August. During the period of repair, temporary electric water heaters will be employed in order to provide hot water for sinks and fitness center showers.

Final repairs, including grounds restoration of the repair site and removal of fencing, are scheduled for completion in middle to late August 2014.

seen

Exhibit at Dulles, Online

Stunning Images Showcase NIH Science

Eye-popping. Jaw-dropping. Psychedelic. Those are just three of the ways people have described Life: Magnified, an exhibit of 46 striking images captured using cutting-edge microscopes. Most of the images came from NIH intramural and extramural scientists.

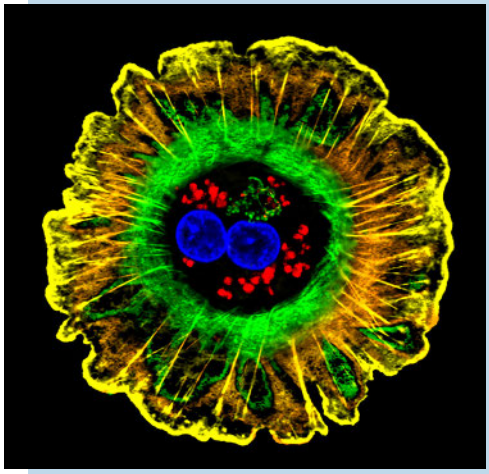
Life: Magnified is showing in two sites—at Washington Dulles International Airport through November and online at www.nigms.nih.gov/education/life-magnified.

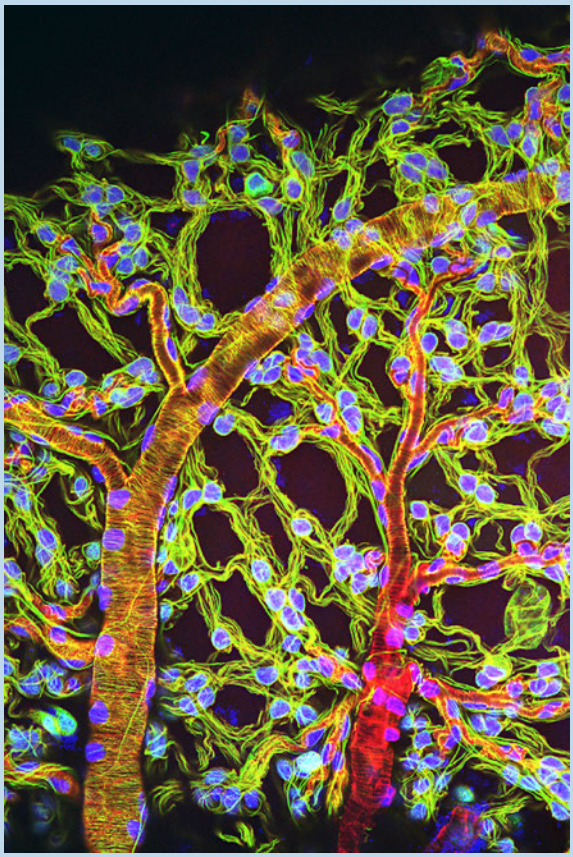
"Through brightly colored images of healthy cells and tissues—and equally stunning representations of a wide range of diseases—the exhibit showcases the beauty and intricacy of biomedical research," said NIGMS director Dr. Jon Lorsch.

More than a million people are expected to view the collection during its 6-month stay at the airport. Even more are seeing it online, as it has already been widely covered by a variety of major news and social media outlets including NBC News.com, *National Geographic*, *The Atlantic*, the *Washington Post*, Weather.com and Buzzfeed.

The images were selected from more than 600 submitted in response to calls from NIGMS and the American Society for Cell Biology, which co-sponsored the exhibit along with the Metropolitan Washington Airports Authority's Arts Program.

For more about the images visit http://directorsblog.nih.gov/2014/06/10/snapshots-of-life-a-fantastic-voyage-inside-the-airport.—**Alisa Zapp Machalek**





***Life: Magnified**. Above, a human liver cell, and at right, a grasshopper ovary—both images are the work of NIH grantees.*

***Below**: Taking in the gallery recently are (from l) NIH director Dr. Francis Collins, Yale researcher Dr. Jo Handelsman and NIH deputy director for intramural research Dr. Michael Gottesman. Scientists from NIH's Intramural Research Program also contributed several images to the collection.*

ASCB PHOTO: CHARLES VOTAW PHOTOGRAPHY