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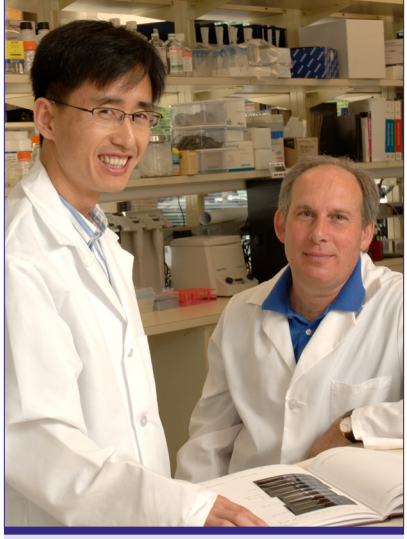

ABOVE • *NIDCD scientists identify genes responsible for stuttering. See story below.*

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The NIH Record is recyclable as office white paper.

'Time Is Right'

Teleconferences Illuminate NCATS Creation Process

By Rich McManus

Back-to-back teleconferences on Feb. 23 shed light on both the mission of, and rationale for creating, a new National Center for Advancing Translational Sciences and making it operational by next Oct. 1.

At both a late-morning meeting-by-phone of the Scientific Management Review Board and a subsequent telephone media availability, NIH director Dr. Francis Collins emphasized two themes in defending the NCATS proposal: it will "advance the discipline of translational science and catalyze the development of novel diagnostics and therapeutics," he said.

Collins explained that NIH has a long history of conducting both translational science and drug development; the AIDS drug AZT and cancer drug Taxol, for example, were developed by NIH-supported investigators. He also cited a recent paper in the *New England Journal of Medicine* showing that, from 1990 to 2007, one-fifth of all new molecular entities submitted to the FDA for priority review as potential therapies were discovered by NIH intramural or extramural scientists.

Collins added that all 27 institutes and centers "have been involved for quite some time" in translational research and that a 2010 survey of the field showed "more than 550 activities involving drugs, vaccines, biologics and devices" in NIH's research portfolio.

SEE **NCATS**, PAGE 6

Combat veteran Todd Bowers speaks at NIH.

For Many Soldiers, War Doesn't Stop After They Arrive Home

By Valerie Lambros

The nation has been at war for nearly 10 years, and those who have been fighting have borne a disproportionate burden of this responsibility for the country.

Only about one-half of 1 percent of the population is in the armed forces, which means a majority of our soldiers, sailors, airmen

SEE **SOLDIERS**, PAGE 8

Genetic Discoveries Challenge Theories About Stuttering and *The King's Speech*

By Robin Latham

The King's Speech, a stirring tribute to the perseverance of King George VI of England and his struggle to conquer his stutter and lead his people through the dark years of World War II, swept the Oscars this year. In King George's time, stuttering was thought to be the result of emotional trauma in childhood or an unhealthy attachment to a parent, usually the mother. Even today, in regards to the 3 million people who stutter in America (and another 60 million worldwide), there are still some who mistakenly think the disability is caused by psychological problems or nervousness.

But that may begin to change as the result of a recent discovery by a team of NIDCD researchers who have identified three different gene mutations that are responsible for stuttering in some adults. Just like King George's struggle with his stammer, the search for these genes is a tale of perseverance—as well as an

SEE **STUTTERING**, PAGE 4

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nih record

briefs

STEP Forum on Humor, Healing

The staff training in extramural programs (STEP) committee will present a Science for All forum on the topic "Humor and Healing: Laughing for Health and Well-Being," on Tuesday, Apr. 5, from 12:30 to 3:30 p.m. in Natcher Bldg., Rms. E1/E2.

Everyone has heard "laughter is the best medicine" and now there is scientific evidence to support it. For example, mirthful laughter can improve blood flow, acting like "internal jogging." This reduces stress, boosts human growth hormone and the immune system. In addition, cancer patients whose treatments include laughter therapy report reduced pain and more rapid return to regular activities at home. Come out of your office and laugh out loud with us. We'll teach you the physiology of laughter and how it can work in medical treatment and everyday life. You'll experience your own laughter therapy and still call it "work." LOL.

Lasker Scholars Symposium, Mar. 31

The NIH-Lasker Clinical Research Scholars Symposium will be held Thursday, Mar. 31 from 9 a.m. to 12:30 p.m. in Masur Auditorium, Bldg. 10. The symposium celebrates a new partnership between NIH and the Lasker Foundation: the Lasker Clinical Research Scholars program, an intramural-extramural partnership to nurture the next generation of clinical researchers (www.nih.gov/science/laskerscholar/). The presenters at the symposium include several physician-scientists who will discuss their own clinical research successes: Daniel Kastner (NHGRI), W. Marston Linehan (NCI), Charles Sawyers (Memorial Sloan-Kettering Cancer Center) and Christine Seidman (Harvard Medical School).

OppNet Hosts Symposium on Amygdala, Emotion, Mar. 25 in Lipsett

NIH's Basic Behavioral and Social Science Opportunity Network (OppNet) announces its second symposium in a series highlighting human and model animal research in the basic behavioral and social sciences. "The Amygdala and Emotion in Human and Nonhuman Primates" is scheduled for Friday, Mar. 25 from 1 to 3 p.m. in Lipsett Amphitheater, Bldg. 10. The symposium will feature Dr. Elisabeth Murray, chief of the section on the neurobiology of learning & memory in the Laboratory of Neuropsychology, NIMH, and Dr. Ellen Leibenluft, chief of the section on bipolar spectrum disorders in the Emotion and Development Branch, NIMH. Dr. Richard Nakamura, NIMH scientific director, will moderate the symposium.

Videocasting and sign language will be provided. Individuals who need reasonable accommodation to attend should contact Angela Farris (301) 402-1146 or the Federal Relay Service at 1-800-877-8339. For more information about OppNet, visit www.oppnet.nih.gov .

NCI Group Holds Retreat, Apr. 11

The 7th annual Center for Cancer Research and Division of Cancer Epidemiology and Genetics staff scientist/staff clinician retreat will be held on Monday, Apr. 11, from 8 a.m. to 5 p.m. at Natcher Bldg. The event offers opportunities to network, exchange ideas, present research and learn. Two keynote speakers will be featured: Dr. Ron Evans of the Salk Institute for Biological Studies and Dr. Christopher Loffredo of Georgetown University. The agenda also includes career development topics, poster sessions, "topic" lunches and workshops. Attendees should register by Apr. 1 at http://web-sandbox.ncifcrf.gov/events/clinicianretreat/2011/default.asp.

'Safety by Design' Symposium Set, Apr. 4-6

The Division of Occupational Health and Safety, ORS, will present a "Safety by Design" symposium Apr. 4-6 in the Natcher Conference Center with the purpose of promoting a culture of safe and responsible science in the conduct of research involving high-risk pathogens. The symposium, titled "A 33-Year Legacy: The NIH Laboratory Safety Monograph Revisited," will focus on advances in the discipline of biosafety occurring since the 1978 NCI publication of the monograph as a supplement to the *NIH Guidelines for Recombinant DNA Research*.

Symposium sessions will address laboratory practices, containment equipment and laboratory design and highlight emerging national issues such as biosecurity, dual-use research and changing roles and responsibilities.

Keynote speakers include Dr. Carol Linden, principal deputy director, Biomedical Advanced Research and Development Authority, Office of the Assistant Secretary for Preparedness and Response, HHS; Dr. Rita Colwell, chairman of Canon U.S. Life Sciences and distinguished university professor, University of Maryland and Johns Hopkins University Bloomberg School of Public Health; and Dr. Arturo Casadevall, professor and chair of the department of microbiology and immunology, Albert Einstein College of Medicine.

For more information and to register, visit www.provenpractices.com/symposium.html.

Pesticide Use Linked to Lupus, Rheumatoid Arthritis

By Jan Ehrman

Along with what you say, be careful what you spray. Frequent or extended exposure to pesticides may increase the risk for developing autoimmune diseases such as lupus and rheumatoid arthritis, according to the results of a long-term follow-up study of thousands of post-menopausal women.

The findings were recently presented by lead scientist Dr. Christine G. Parks of the National Institute of Environmental Health Sciences and her colleagues.

Nearly a billion pounds of pesticides, typically used to kill termites, fleas and household bugs, are spread into the environment each year, through both agricultural and non-agricultural use. According to the *2008-2009 Annual Report of the President's Cancer Panel*, nearly 1,400 pesticides have been registered and approved by the Environmental Protection Agency. However, the report notes, exposure to chemicals found in pesticides has been associated with a variety of cancers including breast, colon, prostate and lung cancer. Further, some research has shown higher rates of various cancers in farmers, pesticide applicators and manufacturers compared to the general, non-using public.

In addition, it is believed that the chemical substances found in pesticides can be toxic to the developing brain. This is backed by recent findings showing that prenatal pesticide exposure may affect intelligence and learning in children, when tested at 3 years of age. Other recent studies show that pesticide exposure may elevate the risk of Parkinson's disease.

Now it appears that a new series of conditions referred to as autoimmune rheumatic disorders—lupus and rheumatoid arthritis (RA)—may also be linked to pesticide exposure.

Parks and her associates looked at the possible relationship between self-reported household insecticide application and the development of either lupus or RA in almost 77,000 women participating in the Women's Health Initiative. The WHI Observational Study, a cohort investigation that began in 1991, was initially designed to track the most common causes of mortality, disability and poor quality of life.

"Although the hypothesis was well-founded [based on higher rates of some autoimmune diseases associated with farming], I was somewhat surprised at the findings," said Parks, who reported that the strongest association between pesticides and the two autoimmune disorders was seen in women who lived on a farm and reported personally applying insecticides. These individuals displayed nearly three times the risk for disease development, compared to women who used no pesticides whatsoever. Meanwhile, lupus/RA risk was doubled for women who underwent 20 or more years of direct exposure (personally applying pesticides) and for those who reported applying insecticides six or more times annually.

While most of the women in the study were Caucasian, no racial differences were seen and the findings were not changed in analyses that accounted for other disease risk factors.

Lupus, also known as systemic lupus erythematosus, is an autoimmune disease—a condition in which the body attacks itself—causing inflammation and damage to healthy tissues and key organs including the heart, lungs and brain. Most lupus patients are female, indicating the condition could have a hormonal or other gender-specific component. RA, another autoimmune disorder, causes joint inflammation and pain, fatigue and other symptoms that may persist for years. Affecting more than a million children and adults, the disease is more prominent in women than men.

In general, the etiology as well as the role of external factors in the development of autoimmune diseases are not well understood. Although data are scarce, most recent findings indicate that the environment may play a contributing role.

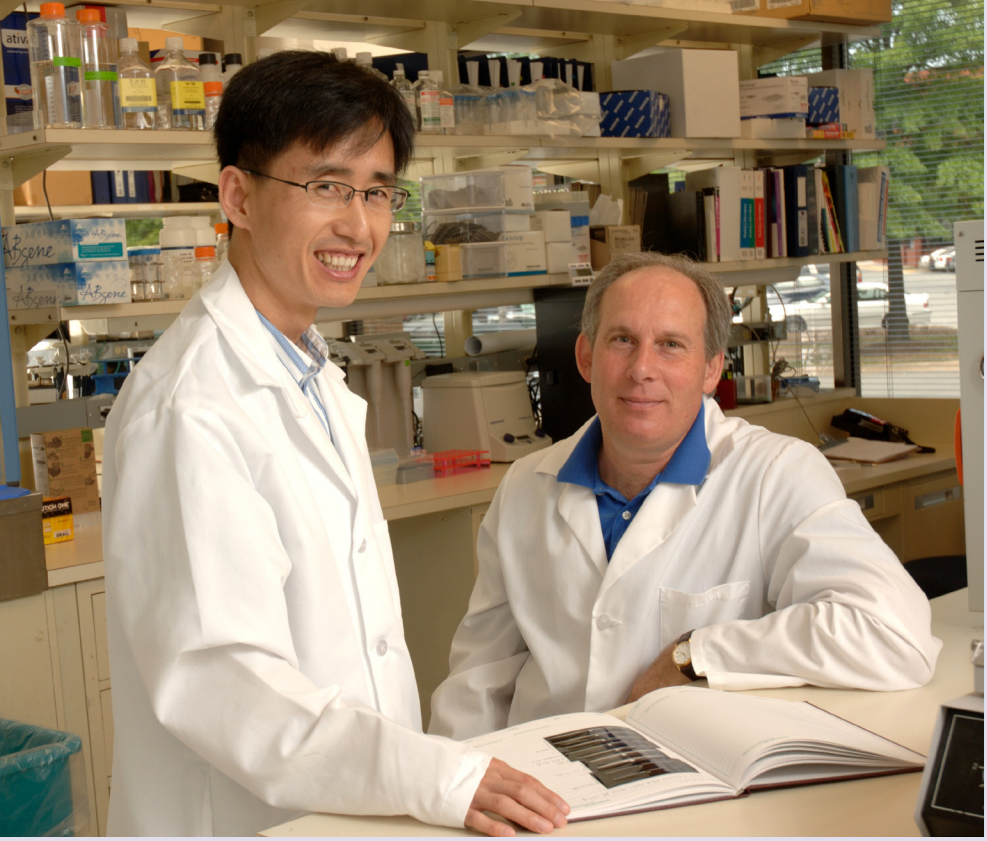
While the findings are notable, Parks' study did have a few shortcomings, she explained. For example, because of the general type of question asked "we were not able to determine which specific insecticides were applied." Also, she pointed out, the data were based on participants' long-term recall.

Still, the findings were robust, that is—"We could see a similar pattern of association for both diseases and a dose response for both increasing frequency and duration of use," said Parks. In other words, the more the exposure, the greater likelihood of developing lupus or RA. She noted that, based on previous studies of farm work, similar findings might be expected in men.

The NIEHS scientist added that a prudent approach would be to limit one's exposure to pesticides as much as possible.

The findings were reported in the February issue of *Arthritis Care and Research*.

Dr. Christine G. Parks of NIEHS led a study showing that frequent or extended exposure to pesticides may increase the risk of developing such autoimmune diseases as lupus and rheumatoid arthritis.



STUTTERING

CONTINUED FROM PAGE 1

***Above**:*
Dr. Changsoo Kang (l) and Dr. Dennis Drayna of NIDCD have been on the hunt for genetic causes of stuttering for years.

ability to find things in unexpected places.

The story begins in 2001 in Dr. Dennis Drayna's laboratory at NIDCD when he began gathering DNA and other data from a cluster of families in Pakistan with a high incidence of stuttering. Pakistan is a good place to study genetic diseases because there is a high rate of intermarriage within extended families. This narrows the gene pool and makes mutations easier to find using genetic linkage studies.

In 2005, Drayna turned up a promising candidate region on chromosome 12 that was likely to harbor a mutant gene, but further progress was proving difficult. When Dr. Changsoo Kang, a visiting fellow from Korea, arrived in Drayna's lab to help with the study, 87 candidate genes on chromosome 12 had been identified and needed to be sequenced and analyzed to see if anything interesting would turn up.

Forty-five genes and 3 years later, with nothing to show for his efforts, Kang felt tired and frustrated. "I wanted to give up," he said. "I told Dennis I was ready to go back to Korea."

For the next week, Kang didn't do any experiments. He poked through his papers at his desk until one day he picked up his lab notebook, flipped through the pages and noticed something.

It was a mutation in a gene he'd seen before, but hadn't thought much of. The gene, *GNPTAB*, was related to a group of diseases known as the mucolipidoses—metabolic disorders so lethal that most babies diagnosed with them die in early childhood. He doubted a gene for a metabolic disorder could have anything to do with stuttering, but he was curious. He began to look through the scientific literature and found a few references to children with milder forms of the muculipidoses who had delayed speech development. But there was nothing that specifically addressed speech problems.

So he did what we all do when we need to know something right away—he Googled. "Mucolipodosis + speech" turned up a web site that described a type of mucolipidosis in which children don't speak at all. He sensed he was headed in the right direction.

Further sequencing of the DNA from the Pakistani families showed that the mutation was present in some people who stuttered and it was also found in members of some of the original families used in the linkage study. Since the *GNPTAB* gene was known to work with two other genes—*GNPTG* and *NAGPA*—he sequenced those genes as well and found mutations that were present in people who stutter and their families, but not in the control groups. In fact, no one had ever found a human with any disease associated with mutations in *NAGPA*, until now. Its only known effect is stuttering.

Currently, Kang, Drayna and their team are working with a knock-in mouse model of one of the genetic variants to test their theory that this form of stuttering is the result of a group of cells in the brain dedicated to fluent speech production. Their hypothesis is that such cells are uniquely sensitive to the slight metabolic defect caused by the mutation.

One goal is to use these mice to discover where in the brain this gene is turned on, since this could indicate the location of the cells. Another long-term goal is to see if the human stuttering mutation can disrupt vocal communication in the mouse. However, before the scientists can understand what a stuttering mouse might sound like, they will have to better understand normal mouse speech patterns.

The researchers are looking forward to a future when stuttering can be treated as a biological disorder with a medical cure, instead of looking at it as a character weakness—as in King George's time—that can't be helped.

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: Concerning construction in "old" Bldg. 10: It's been bad enough that they closed several of the west end North corridor hallways, making it difficult to get around, but now they are going to close most of them for "reconstruction" work. That, combined with the already closed South corridors, is going to make it very hard for some us to get around (like those of us who can't easily do stairs). I've also noticed that they seem to be in the process of blocking access to the stairs near the main elevators (C corridor). Isn't this a fire and safety hazard? I'm concerned that the people who work in these parts of Bldg. 10 were not taken into consideration when construction plans were put in place.

Response from the Office of Research Services and Office of Research Facilities: The corridor closures and construction partitions are necessary to ensure the safety of employees, patients and visitors while a major renovation project is under way in the F wing.

Access to the central solarium stairwell, occupied office areas, solarium conference rooms used by NCI, NIDDK and NIAID, along with the bathrooms, will be maintained to the greatest extent possible during construction. There is no intent to close off active areas of the solarium during construction.

The new doors and partitions being built in the main elevator lobbies are necessary to provide dust and pressurization control for areas under construction in the F wing. They will not be closed during normal daytime working hours.

In addition to closures on floors 2 through 5, the 9th floor North corridor will also be closed to through traffic. The closure is necessary to proceed with the complete demolition of these areas followed by the installation of new laboratories and utilities to service 10 institutes. Visitors will be directed to use the 1st floor to travel between the main elevator lobby and the D corridor, but corridors on floors 6 through 8 and 10 through 13 will remain open as well.

The Division of the Fire Marshal, ORS, reviewed and approved the plan for the entire F wing project in accordance with NIH Policy Manual 1370 (Fire Protection and Life Safety Building Permit Process). Emergency egress routes have been altered and appropriate signage will be provided. In addition, access to stairwell 7 in Bldg. 10 will be maintained. All emergency egress routes were carefully reviewed to ensure that Life Safety Code compliance is maintained throughout the duration of this project.

Feedback: What is going on with the old Bldg. 31B parking lot? We were told it was to be a meadow-like area but it's starting to look like a dump. The ground is torn up with tire tracks, there is an old, rusty dumpster sitting out there and sheets of plywood on the ground. When can we expect that area to be returned to a more natural setting?

Response from ORS and ORF: The area in question is currently being used as a "laydown" area for a project involving the installation of an automatic sprinkler system for the Bldg. 31 complex. This laydown area was previously approved by the ORF-ORS site selection review committee. Once the contractor completes the installation work, it is required to remove its equipment and restore the area to its previous state.

Feedback: When there is a big event on campus, why doesn't the shuttle service offer additional shuttles for pick-up/drop-off times on these days for people who are off campus? For example, going to the CFC event, the shuttle was so packed it seemed unsafe.

Response from ORS: The Division of Amenities and Transportation Services has, in the past, provided extra shuttle service to events when the sponsors have requested it. This extra shuttle service has normally been provided at no cost or a reduced cost to the sponsor of the event.

Some recent examples include: Earth Day/Take Your Child to Work Day, Take a Hike Day, "Big Think" Meeting, OD Honor Awards Ceremony and several retreats and all-hands meetings and conferences for various ICs.

In the future, with the tight budget situation, it is uncertain whether we will be able to provide additional no-cost or reduced-cost shuttles. However, event coordinators can continue to hire additional shuttles or even coach buses for events that require bringing large numbers of employees and/or visitors to the NIH campus.

For shuttle buses, you can contact Louise Davis at (301) 496-9621. For coach buses, you can contact the NIH Motor Pool at (301) 496-3426.

Join the NIH-HHS Mentoring Program

NIH wants *you* to join the HHS Mentoring Program. Federal employees interested in serving as mentors and mentees across the NIH community are invited to join the NIH April 2011 cohort. "Partnering for Excellence" through building a confidential, interactive relationship is the cornerstone of the program. It emphasizes developing core, leadership and management competencies at various levels to ensure a beneficial experience for both mentors and mentees.

Program features include: peer-to-peer and senior-to-junior relationships; online application and matching system to connect individuals; online mentor-mentee orientation; 1-year mentoring relationship commitment; and professional development events and activities.

The Mentoring Program does not supplant NIH scientific mentoring and customized IC leadership mentoring programs available to employees in some institutes and centers. Instead, it is intended to fill any gaps where those programs do not exist and enables NIH-wide or even across-HHS relationships.

Visit the NIH-HHS Mentoring Program site at http://trainingcenter.nih.gov/HHS_Mentoring.html. For more information, send email to nihhhsmentoringprog@od.NIH.gov.

NCATS

CONTINUED FROM PAGE 1

So why create a new center now? "As Will Rogers once said, 'Even if you're on the right track, you'll get run over if you just sit there,'" said Collins. "There has been a deluge of discoveries of potential new targets," he explained, and the "genomics revolution" has also offered a tempting array of possible therapeutic avenues that are going unexploited.

The goal is to move promising products far enough along that drug companies would take over development eventually, resulting in a triple-win situation: NIH pioneers new therapeutics, pharma takes the ball over the goal line and the public benefits from better medicines.

The proposed NCATS, said Collins, would "serve as a catalyst to enhance NIH's long-standing involvement" in translational research and drug development. "This is not an effort to turn NIH into a drug development company," he warned. The goal is to move promising products far enough along that drug companies would take over development eventually, resulting in what Collins called a triple-win situation: NIH pioneers new therapeutics, pharma takes the ball over the goal line and the public benefits from better medicines.

The morning SMRB session, the 9th meeting of that body, primarily served to describe how three working groups are determining how NCATS will be assembled and how the National Center for Research Resources will be abolished as its major programs are either absorbed by NCATS or transferred to other institutes or the Office of the Director.

The first working group, composed of senior leadership across NIH and co-chaired by NIMH director Dr. Thomas Insel and NHGRI director Dr. Eric Green, is charged with outlining the mission and function of NCATS; its report was due Mar. 1 to Collins.

The second group, a subset of the advisory committee to the NIH director chaired by Dr. Maria Freire of the ACD, is examining how NCATS can best partner with the private sector. This group held its first all-day meeting Feb. 4.

The third group, the NCRR task force co-chaired by NIH principal deputy director Dr. Lawrence Tabak and NICHD director Dr. Alan Guttmacher, offered "final interim recommendations" that assigned NCRR's programs, including the Clinical Translational Science Awards (CTSAs, which fund 55 research centers nationwide), to new homes. These were posted Feb. 22 at http://feedback.nih.gov/index.php/ncats/task-force-recs/.

One SMRB member, Dr. Thomas Kelly of the Sloan-Kettering Institute, acknowledged "a fair amount of angst out there over the redistribution of NCRR programs" and elimination of the center, and said he didn't think the board had adequately discussed the repercussions. Why not leave NCRR intact and simply move the CTSA program elsewhere?, he wondered.

Tabak said the first thing his task force considered was determining whether that solution might work, but concluded that the "coat of many colors" that NCRR has evolved into over time is not the optimum arrangement, given new scientific opportunities. Tabak also said his group had conducted a thorough analysis of the proposed change.

"At no time was there ever an intention to eliminate extant NCRR programs," he said. All programs will be maintained, but moved around organizationally, he said, "to enhance scientific opportunities, based on adjacency."

Insel said his group, the IC directors NCATS working group, had met seven times since Jan. 4, including a Feb. 4 joint meeting with Freire's group. He predicted the new center will serve "as a catalyst for translation." Especially strengthened will be the field of clinical pharmacology, which has been languishing, he added.

Eight individuals spoke up during the public comment portion of the SMRB meeting; virtually all applauded the proposed new center. Said Amy Comstock Ricks of the Parkinson's Action Network, "A dried-up pipeline of new therapies is unacceptable."

At a 50-minute press telebriefing a half-hour after the SMRB session ended, Collins said the NCATS mission "has been embraced by the institute directors" and said it would herald a new era of collaboration with FDA, pharma, biotech, advocacy groups, non-profits and academia.

He hoped that the President's FY 2012 budget, which includes $100 million to start the Cures Acceleration Network, wins passage; CAN is to be part of the proposed NCATS. Collins also hopes that NCATS, by bringing a raft of new therapies across the so-called "Valley of Death," would turn into "a valley that leads to life."

In responses to questions from seven reporters, Collins said: the NCATS budget would be around $700 million (not including possible CAN funding) and will require a budget amendment from the White House; NIH will soon advertise globally for an NCATS director-designate; intellectual property issues arising out of NCATS will follow a model already in place; and CAN could potentially have "a DARPA-like authority" (the Defense Advanced Research Projects Agency begat both the Internet and GPS technology, Collins noted).

In conclusion, Collins emphasized that he "understands that people are unsettled by change…The goal is not to diminish the importance of programs but to empower them. I am optimistic that the impression [of standing up NCATS so rapidly] will improve.

"This is not an attempt to replace, but to augment what the ICs have done traditionally," he continued. "Five years ago, this [undertaking] would have been premature; 5 years from now, it would be a missed opportunity. The time is right…maybe especially in a difficult budget environment."

Coleman Named First Permanent NIMHD Scientific Director

Dr. William G. Coleman, Jr., has been appointed first permanent scientific director of the National Institute on Minority Health and Health Disparities. He will lead the institute's recently established Intramural Research Program, which promotes research focused on understanding the factors that cause health disparities, including the linkage between biological and non-biological pathways to health disparities.

NIMHD's IRP will also develop methods and interventions to address these disparities using a community-campus system approach. The program is also geared towards increasing the pool of those conducting research on health disparities including the number of investigators from health disparity populations within the NIH intramural research program.

"To have an experienced scientist like Dr. Coleman, who has a long-standing track record of achievement within the scientific community, to lead our IRP so that we can intensify our health disparities research work, is truly exhilarating," said NIMHD director Dr. John Ruffin.

Coleman has been at NIH since 1974. During his extensive career here, he has made seminal contributions to the elucidation of lipopolysaccharide biosynthesis, intrinsic gram-negative bacteria antibiotic resistance and the pathogenic mechanisms of *Helicobacter pylori*. In addition to conducting research, he has mentored an impressive cadre of students, postdoctoral fellows and high school science teachers. Many have assumed leadership positions in medical schools and hospitals throughout the nation. He received his Ph.D. in molecular biology from Purdue University.

"Bill Coleman is an innovative and productive scientist whose work on *Helicobacter pylori* has been of the highest quality," said NIH deputy director for intramural research Dr. Michael Gottesman. "He is highly regarded for his skill as a mentor and his interest in training and education at the NIH. He will be a superb leader and organizer of a unique intramural program."

Currently, Coleman is developing research programs that include basic science, social, behavioral and clinical approaches to address disparities in health in underserved communities in this country. As a senior investigator, he will continue his research on understanding the mechanisms of bacterial pathogenesis, specifically as they relate to ulcer disease and other bacterial infections in the Laboratory of Biochemistry and Genetics at NIDDK.

"I am honored and humbled by this appointment," Coleman said. "The challenges are immense, but I am heartened by the partnership and commitment of the NIH to address this important issue. A primary emphasis of the NIMHD intramural research program will be the development of mentorship programs, which are critical to the development of a diverse workforce."

The NIMHD IRP fosters collaborations with other NIH institutes and centers, particularly through its signature career development program, Disparities Research Education Advancing our Mission (DREAM). The 5-year program offers 2 years of career development opportunity for investigators to hone solid research skills within NIH's IRP. The other 3 years of the program are spent in an extramural venue such as the candidate's originating institution or organization, another academic setting or a health disparity community setting. The extramural phase is intended to facilitate the transition to independence as a researcher. To be eligible for DREAM, candidates must be graduates or scholars nearing completion of their tenure in the NIMHD Loan Repayment Program. Candidates are placed in the laboratories of other ICs, depending on area of interest.—**Briant Coleman and Kester Williams**

EPA Lauds NIH Energy Conservation Efforts

The Environmental Protection Agency recently recognized NIH as one of three facilities to earn the Energy Star Combined Heat and Power (CHP) award for simultaneously producing electricity and useful thermal energy from a single energy source such as natural gas, biomass, coal or waste heat. "Cogeneration" technology leads to energy savings and reductions in greenhouse gas emissions and other air pollutants.

Dr. Farhad Memarzadeh (l), director, Division of Technical Resources, Office of Research Facilities, receives a 2011 Energy Star Award on behalf of NIH from Gary McNeil of the EPA.

NIH's Cogeneration Plant adjacent to Bldg. 11 is one of the cleanest ever built in the world with an average 10 parts per million of nitrogen oxide emission. The plant began operation in 2002, using a natural gas-fired CHP system. The plant produces energy savings of 640 billion BTUs a year—the equivalent of the energy used in about 5,000 homes in a year.

NIH's CHP system—designed and developed by Pepco Energy Services—generates up to 23 megawatts of electricity for the local grid. By using otherwise-wasted heat from the exhaust of the combustion turbine, it also produces up to 180,000 pounds per hour of steam that is used to provide heating, cooling and to support laboratory operations. Cogeneration saves NIH an estimated $4 million each year in steam and electricity costs.

With an operating efficiency of 76 percent, the CHP system requires approximately 31 percent less fuel than a typical energy-supply system. By comparison, the efficiency of separate production of electricity and thermal energy is typically less than 50 percent. The CHP system prevents an estimated 51,400 tons of CO_2 emissions annually, equivalent to the emissions of more than 8,900 passenger vehicles.

SOLDIERS

CONTINUED FROM PAGE 1

***Above**:*
Army Lt. Col. Philip Holcombe

***Below**:*
Pulitzer-prize winning journalist David Finkel

PHOTOS: ERNIE BRANSON

and Marines have endured multiple combat deployments.

Some don't return, but the ones who do are often not the same.

A recent National Institute of Mental Health Director's Innovation Speaker Series lecture offered listeners a sample of what today's warfare is, what it does to service members and what we can do to bring them home both physically and mentally.

NIMH director Dr. Thomas Insel opened the talk by recalling his institute's role in the Army's STARRS program—Study To Assess Risk and Resilience in Servicemembers—which was started in response to the high rate of suicide experienced by members of the military returned from war.

While Insel called the study itself a "big investment in money and time," he emphasized the importance of not losing sight of the people at the heart of this program, the soldiers. "We need to hear about this experience from people who have been close to it."

Todd Bowers, a staff sergeant in the Marine Corps Reserves, is deputy executive director of the Iraq and Afghanistan Veterans of America, a national non-profit dedicated to connecting new veterans to services and to each other. A decorated Marine, he has been on two tours in Iraq and has also been deployed to Afghanistan.

As a civil affairs specialist, his job has been liaison with the country's locals to reduce civilian interference with military operations. But that doesn't mean he hasn't been shot at or had to use his weapon.

In 2004, during his second deployment to Iraq, Bowers not only fired, but also took enemy lives. He also got lucky, on Oct. 17, 2004.

"I was aiming my weapon and [an incoming] bullet stuck in my scope," he said, marveling at how that slim tool mounted on top of his rifle took the shot that would have hit him in the head. "You cannot plan for where bullets land and where bombs go off. It wasn't until I got home that I realized it was going to be hard to adjust."

Things were even harder after his trip to Afghanistan. Previously, he had known people who had died in the line of fire or who had suffered devastating wounds. But it was in Afghanistan that he lost a teammate, a friend from home. It was as if the wall between his military life and his home life had crumbled.

"When you go into war, you go into this bubble and that was the first time it ever popped while in theater," Bowers said. "I could not fathom how I was going to come home."

David Finkel, a Pulitzer Prize-winning journalist with the *Washington Post* who embedded with an infantry battalion during the Baghdad surge of 2007 and 2008, spoke of what he learned during his 15-month tour, an experience that produced a book, *The Good Soldiers*.

"The typical guy was 19 years old. Most had not been out of the country. There was a lot of naïveté," he said. "And then, war did what war does. They lost a guy and then lost a couple more guys. There were even more wounded. The enemy weapon of choice in that area was the explosively formed penetrator," a device similar to an IED, but specifically designed to pierce armor.

To illustrate this deadly contraption, Finkel played a short video that was recorded from inside a Humvee. As a truck in the convoy exploded, the audience winced.

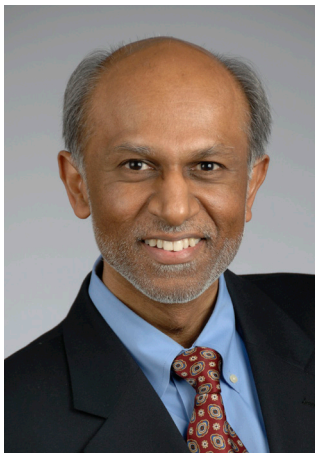
Finkel told the stories of several soldiers whose injuries may not have been visible but were nonetheless real. One carried a bleeding friend down a flight of stairs, only to be unable to get the taste of his friend's blood out of his mouth months, even years, later. Another did his job so well he now fears he has become a monster. One team leader sent a truck of soldiers down a road, only to have them run into an IED, killing two of them.

"He [unfortunately will] think about that decision for the rest of his life," Finkel said. "Some said they were fine and they were; some said they were fine and they weren't. But most of these guys are in the great middle."

It's in this area of mental health that Army Lt. Col. Philip Holcombe, a psychologist with the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury (TBI), said there is much work being done in the area of TBI and PTSD. Studies like STARRS, as well as research and treatment conducted by the Defense Centers of Excellence, are leading the charge, he said.

"It's going to take a series of efforts joined together over time to handle this," he concluded. "We're not going to swallow this elephant whole. We have no choice but to confront this issue. We have to do this to call ourselves humane. We must serve those who serve."

milestones



Nath Named New Clinical Director at NINDS

By Shannon E. Garnett

NINDS recently named Dr. Avindra Nath as its new intramural clinical director. He is internationally recognized for his contributions to elucidating HIV pathogenesis in the central nervous system. In addition to becoming clinical director and head of the NINDS section of infections of the nervous system, he will develop a center dedicated to translating new therapies for neurological disorders to clinical use.

"We are delighted that Dr. Nath will join the intramural program," said NINDS director Dr. Story Landis. "He has an outstanding research program that adds strength to our neurovirology and neuroimmunology programs. Avi has superb leadership skills as well, which help ensure he will be an outstanding clinical director."

"A major goal of Avi's will be to develop a focused effort that can help accelerate translational efforts in NINDS in a way that can complement NIH-wide efforts," said NINDS scientific director Dr. Alan Koretsky. "Avi also will put a lot of emphasis on improving clinical training programs within NINDS. Finally, his joining will help ensure we continue to attract outstanding young clinician-scientists to the NINDS intramural research program."

Early in the HIV epidemic, Nath and his colleagues discovered that Tat, a viral protein, could directly stimulate neurons. In subsequent studies, he found that Tat also activated glial cells leading to chemokine release that in turn cause macrophage recruitment into the central nervous system. Most recently, Nath discovered that some individuals with HIV—despite an excellent response to retroviral treatment—develop a devastating immune cell-mediated encephalitis called CNS-immune reconstitution inflammatory syndrome. He will continue his HIV investigations at NIH in collaboration with Dr. Clifford Lane in NIAID.

Nath also has helped to develop several neuroprotective compounds that are in various stages of development and clinical testing. Because of shared cellular and molecular mechanisms, these compounds may have potential use in a wide variety of neurodegenerative and neuroinflammatory diseases.

Born in Saskatoon, Canada, Nath earned his medical degree from the Christian Medical College in Ludhiana, India, in 1981. He then completed both a neurology residency (1986) and a neuroimmunology fellowship (1988) at the University of Texas Health Science Center in Houston. In 1990, he completed a fellowship in neurovirology at NINDS, working in the section of molecular virology and genetics in the Laboratory of Viral and Molecular Pathogenesis (LVMP) with Dr. Eugene Major, chief of the Laboratory of Molecular Medicine and Neuroscience, and Dr. Monique Dubois-Dalcq, who was then LVMP chief.

After leaving NIH in 1990, he joined the faculty of the University of Manitoba in Winnipeg, in the departments of medical microbiology and internal medicine. He left Manitoba in 1997 to join the faculty of the University of Kentucky in the microbiology and immunology and neurology departments.

Before returning to NIH, Nath was a professor of neurology and neuroscience. He held several leadership positions at Johns Hopkins University School of Medicine: director of the Division of Neuroimmunology and Neurological Infections (DNNI); director of the Neurovirology and Neuroimmunology Laboratory (NNL) and co-director of the Neuro-AIDS Translational Research Center. As director of DNNI and NNL, he recruited an exceptional cadre of investigators and created the clinical fellowship program in neuroimmunology and neurological infections—the only one of its kind in the country.

Nath has published more than 200 manuscripts, reviews and book chapters and served on the editorial boards of the *Journal of Neurovirology* and *Current HIV Research*. He also has edited a book on clinical neurovirology. Currently, he chairs the section of neuro-infectious diseases of the American Academy of Neurology and serves as vice president of the International Society of Neurovirology. Nath is an elected member of the American Neurological Association.

Gerratana Joins Staff at NIGMS

Dr. Barbara Gerratana recently joined NIGMS as a program director in the Division of Pharmacology, Physiology, and Biological Chemistry, where she will be responsible for research grants on enzyme catalysis and regulation. Before coming to NIGMS, she served as an associate professor with tenure in the department of chemistry and biochemistry at the University of Maryland. Gerratana earned a B.S. in chemistry from the Università degli Studi di Pavia in Pavia, Italy, and a Ph.D. in biochemistry from the University of Wisconsin.

digest

An NIAID-funded study has found that spraying malaria-transmitting mosquitoes with a genetically modified fungus can kill the malaria parasite without harming the mosquito, potentially reducing malaria transmission to humans.

Genetically Modified Fungi Kill Malaria-Causing Parasites in Mosquitoes

Spraying malaria-transmitting mosquitoes with a genetically modified fungus can kill the malaria parasite without harming the mosquito, potentially reducing malaria transmission to humans, according to a study in Feb. 25's *Science*. Funded by NIAID, the study was led by Dr. Raymond J. St. Leger of the University of Maryland.

An estimated 225 million malaria cases occur worldwide annually, resulting in about 781,000 deaths each year, according to the World Health Organization. Although the disease is present in 106 countries around the world, most cases occur in sub-Saharan Africa. Treating bed nets and indoor walls with insecticides is the main prevention strategy in developing countries, but the *Anopheles* mosquitoes that transmit malaria are slowly becoming resistant to these insecticides, rendering them less effective.

"Because mosquitoes increasingly are evolving to evade the malaria control methods currently in use, NIAID-supported scientists are testing new, innovative ways to prevent malaria that we hope can be developed into tools that will be effective for years to come," said NIAID director Dr. Anthony Fauci.

One of these new strategies is killing *Anopheles* mosquitoes by spraying them with the naturally occurring fungus, *Metarhizium anisopliae*. Previous studies have found that this method nearly eliminates disease transmission when mosquitoes are sprayed soon after acquiring the malaria parasite. However, this strategy is not sustainable in the long term. If treating mosquitoes with the fungus kills them before they have a chance to reproduce and pass on their susceptibility to the spray, mosquitoes resistant to the fungus, which would reproduce normally, will soon become predominant and the spray will no longer be effective.

Because of this, St. Leger and colleagues tried a different approach. Rather than developing fungi that rapidly kill the mosquito, they genetically modified *M. anisopliae* to block the development of the malaria parasite in the mosquito.

Study Finds Nitric Oxide Does Not Help Sickle Cell Pain Crisis

Inhaling nitric oxide gas does not reduce pain crises or shorten hospital stays in people living with sickle cell disease, according to the results of a study sponsored by NHLBI. "Nitric Oxide for Inhalation in the Acute Treatment of Sickle Cell Pain Crisis," was published in the Mar. 2 issue of the *Journal of the American Medical Association*.

Sickle cell disease is an inherited disorder affecting between 70,000 and 100,000 Americans. The disease causes red blood cells, which are normally disc-shaped and pliable, to become misshapen, stiff and sticky. Severe pain crises occur periodically in people living with sickle cell disease when these sickled red blood cells hinder proper blood flow.

Nitric oxide dilates and expands blood vessels and enhances blood flow. Levels are lower in persons with sickle cell disease than in those without the disease. Previous trials with smaller numbers of patients had suggested that administration of nitric oxide might shorten sickle cell pain crises.

The study involved 150 sickle cell disease patients who were hospitalized for severe pain crises. Each participant was given nitric oxide gas or a placebo gas during treatment. Though the nitric oxide was well-tolerated, it failed to improve outcomes.

Gene Glitch May Hold Clues for Schizophrenia

Scientists are eyeing a rare genetic glitch for clues to improved treatments for some people with schizophrenia, even though they found the mutation in only one-third of 1 percent of patients.

In the study, funded in part by NIH, schizophrenia patients were 14 times more likely than controls to harbor multiple copies of a gene on chromosome 7. The mutations were in the gene for VIPR2, the receptor for vasoactive intestinal peptide (VIP)—a chemical messenger known to play a role in brain development. An examination of patients' blood confirmed that they had overactive VIP activity.

Discovery of the same genetic abnormality in even a small group of patients buoys hopes for progress in a field humbled by daunting complexity in recent years. The researchers' previous studies had suggested that the brain disorder that affects about 1 percent of adults might, in many cases, be rooted in different genetic causes in each affected individual, complicating prospects for cures.

"Genetic testing for duplications of the VIP receptor could enable early detection of a subtype of patients with schizophrenia, and the receptor could also potentially become a target for development of new treatments," said Dr. Jonathan Sebat, an NIMH grantee at the University of California, San Diego, who led the research team. "The growing number of such rare duplications and deletions found in schizophrenia suggests that what we have been calling a single disorder may turn out, in part, to be a constellation of multiple rare diseases."

volunteers

Study for Mothers of 4- and 5-Year-Olds

Are you a mother of a 4- or 5-year-old? You may be able to participate in the Mothers' TAKE study, which stands for Mothers' Thoughts About what their Kids Eat. Participants will fill out online surveys and complete one 90-minute in-person session at NIH. Your child will not need to participate. Compensation is provided. Call (301) 451-1268 or email mothers.take@gmail.com and leave a phone number where you can be reached. Refer to study 10-HG-0076.

Women's Health Studies Seek Healthy Volunteers

Healthy women ages 18-65 are invited to participate in outpatient research studies. Compensation is provided. Call (301) 496-9576 and refer to protocols 81-M-0126, 88-M-0131 and 03-M-0138.

Midlife & Menopause Research Studies

Women ages 40-65 who struggle with irritability, anxiety, sadness or loss of enjoyment at the time of the menopause transition are invited to participate in outpatient research studies. There is no cost for participation. Compensation may be provided. Phone (301) 496-9576 and refer to study 88-M-0131.

Study of Neck Pain

Are you a healthy individual with neck pain for 3 months or less? If you are between the ages of 18 and 65, you may be able to participate in a neck pain study and receive a comprehensive cervical musculoskeletal examination. Healthy volunteers are also needed. Email NeckPainStudy@gmail.com or call (301) 451-7514. Refer to study 02-CC-0245.

Mitochondrial Biology Symposium, May 16-17

The 2011 NHLBI Mitochondrial Biology Symposium: Advances in Mitochondrial Dynamics and Mitochondrial-Cytosolic Communications will be held May 16-17 at the Natcher Conference Center.

The second in a biennial series of mitochondrial biology symposia hosted by NHLBI, it will include scientific sessions on mitochondrial dynamics and autophagy—from basic concepts to disease pathophysiology; and mitochondrial communication with the cytosol—fundamental concepts and role in pathophysiology. Keynote speaker will be Dr. Douglas C. Wallace, chair in pediatric mitochondrial medicine and metabolic disease and director of the Center for Mitochondrial and Epigenomic Medicine at Children's Hospital of Philadelphia.

Submit your abstract online by Apr. 8; registration deadline is Apr. 29 at www.NHLBIMitochondrialSymposia.org and is free. For more information contact Elizabeth Meyer at elizabethmeyer@strategicresults.com.

NIGMS director Dr. Jeremy Berg (second from r) welcomes new members to the institute's advisory council. Pictured are (from l) Dr. Luisa DiPietro, Dr. David O. Meltzer, Dr. Karolin Luger and Dr. Denise J. Montell.

New Members Join NIGMS Council

Four new members have joined the National Advisory General Medical Sciences Council.

Dr. Luisa DiPietro is a professor of periodontics and director of the Center for Wound Healing and Tissue Regeneration at the University of Illinois at Chicago. She studies how wounds heal, with the ultimate goal of developing therapies that will allow humans to regenerate scar-free tissue after an injury.

Dr. Karolin Luger is university distinguished professor of biochemistry and molecular biology and a Howard Hughes Medical Institute investigator at Colorado State University in Fort Collins. She studies structural transitions of chromatin using X-ray crystallography, fluorescence techniques and other biophysical approaches.

Dr. David O. Meltzer is chief of the section of hospital medicine and director of the Center for Health and the Social Sciences at the University of Chicago, where he analyzes techniques to evaluate the cost and effectiveness of medical technologies.

Dr. Denise J. Montell is a professor of biological chemistry and director of the Center for Cell Dynamics at Johns Hopkins School of Medicine. She studies the cellular and molecular mechanisms that regulate cell migration, which is critical to immunity, wound healing and tumor metastasis.

Special Love Celebrates R&W President Schools with Gala Fundraiser

On Feb. 5, Special Love Inc. honored R&W President Randy Schools for over a quarter century of service at its gala "Fly Me to the Moon—An Evening of Special Love for Children with Cancer." More than 200 people attended the event, including friends, family and colleagues.

Schools helped launch Special Love, which sponsors Camp Fantastic every summer for kids with cancer, in 1983 and has been active ever since. The event raised more than $80,000 to fund the charity's programs for mid-Atlantic children with cancer and their families.

Randy Schools

In his acceptance of the award, Schools said, "Love is what life's all about—spreading love and doing whatever we can to help other people and make their lives a little easier."

Presenting the award, Special Love CEO Dave Smith described Schools as "a true unsung hero in the community." Smith said he was surprised Special Love had gotten to Schools first. "Randy is involved in so many worthwhile Montgomery County charities and organizations and I know all of them will agree that he deserves all the praise we can give him."

In addition to his work as R&W president, a post he has held since 1977, Schools has had leadership positions with the Bethesda-Chevy Chase Chamber of Commerce, Leadership Montgomery, Children's Inn at NIH, Friends of the Clinical Center, Bethesda Big Train and numerous other organizations.

"Randy's roles at Special Love have included just about everything," Smith said. "He started out as a camp counselor at Camp Fantastic teaching swimming and went on to be board president, fundraising chair, public relations representative and just about every other job you could think of."

Special Love sponsors two week-long camps, Camp Fantastic for young cancer patients and BRASS Camp for their siblings. It also hosts weekend camps for families, teens and young adults as well as day trips to the circus and local sporting events. Special Love also provides financial assistance in the form of emergency grants and college scholarships. For more information, visit www.specialove.org.

Cedar Lane Bridge Repairs To Mar Commute This Summer

Commuters who use Cedar Ln. to cross Rock Creek on the ride to and from NIH are in for difficulties this summer as the bridge over the creek is closed for repairs from June 17 to Aug. 24.

The county chose that window of time to coincide with school vacations and to precede implementation of Base Realignment and Closure (BRAC) project changes at the National Naval Medical Center.

The county department of transportation determined several years ago that the bridge, originally built in 1959 and which carries more than 12,500 vehicles daily (and a projected 15,500 vehicles daily once BRAC gets under way at Navy), is structurally deficient. The bridge superstructure will be entirely replaced over a 10-month construction schedule.

There will be a temporary pedestrian bridge across Rock Creek during bridge reconstruction. The work will close Cedar Ln. between Beach Dr. and Parkhill Ave. (which has east and west segments).

The new bridge will feature only a single southbound lane; the current sidewalk under the Beltway will widen to become a 12' 8"-wide shared-use path for about 500 feet between Rock Creek Trail and Elmhirst Trail.

"The short length of the single lane, coupled with the fact that only two lanes (one each way) exist just north of the bridge, supports the decision" to build the widened shared-use path, according to the county DOT.

When the school year ends, a detour route will carry commuters around the project, using Strathmore Ln. and Rockville Pike as an alternative route.

For updates on the project, visit www.dpwt.com.

Only Dogs & Cats Make Great Pets? Hogwash!

Since she was 14 years old and became a vegetarian, NIAID's Julie Marquardt had been threatening to save a pig from the county fair. Last summer, she made the dream a reality when she entered a 4-H bidding war at the Calvert County fair and won. This particular 215-pound prize—whom she named Hay-Seus—won her over instantly with his big personality and wagging tail. "He obviously loved life—he needed to keep living it," she explains. Now over 250 pounds, Hay-Seus recently celebrated his first birthday. He lives on a farm outside of Annapolis, where his three best friends are cows (and Marquardt, of course).