

nih record



ABOVE • NIDDK's Dr. Sushil Rane and his lab were recently the center of attention as congressional staffers visited NIH. See p. 12.

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Patient Reunites with Life-Saving Scientist

NIH Science Permits 'Command Performance'

By Rich McManus

By the time Linda Taylor arrived at the Clinical Center in November 1984 with advanced metastatic melanoma, 80 patients with a similar diagnosis had come to NCI Surgery Branch chief Dr. Steven Rosenberg for experimental treatment with an immune system stimulant called interleukin-2 (IL-2) or for administration of immune cells. All of them died of their disease.

No one, including Rosenberg, guessed that patient No. 81, Taylor, would become what he calls “a historic figure in modern oncology. She’s really part of the history of the NIH and the Clinical Center.”

Taylor is the first cancer patient to be cured by immunotherapy, a treatment pioneered in Rosenberg’s branch that has now matured into an exciting field that made

SEE TAYLOR, PAGE 6



NCI's Dr. Steven Rosenberg reunites with former patient Linda Taylor, whose cancer vanished 29 years ago. She was interviewed for a PBS series.

'An Incredible Place'

NIH Alum Pizzo Returns, Applauds Unique Environment

By Carla Garnett

Before there was a Children’s Inn at NIH. Long before the current 75+ percent survival rate for pediatric cancers or the new hope for an AIDS-free generation. Before HIV and AIDS were even realities, there was a young physician finishing his residency at Children’s Hospital in Boston. Interested in research, infectious disease and cancer, he was abruptly summoned to Bethesda in June 1973. NIH needed a pediatrician to treat “Teddy,” a boy living in a sealed room on the 13th floor of the Clinical Center.



Dr. Philip Pizzo is warmly welcomed back to NIH.

“This was one

SEE PIZZO, PAGE 10

Champion of Global Health

Gates Discusses R&D Efforts to Improve Health in Developing Countries

By Dana Steinberg

Entrepreneur and philanthropist Bill Gates delivered the annual David E. Barmes Global Health lecture on Dec. 2. More than 1,000 people lined up to attend the talk, filling 500-seat Masur Auditorium and overflow in Lipsett Amphitheater and FAES conference rooms. Another 4,000 people watched the lecture live via webcast.

Gates, who is co-chair of the Bill and Melinda Gates Foundation and co-founder and chairman of Micro-



Bill Gates gives Barmes Lecture at NIH, Dec. 2.

SEE GATES, PAGE 4





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NIH...Turning Discovery Into Health

briefs

Meet OEODM Program Managers at Open House, Jan. 28 in Wilson Hall

The Office of Equal Opportunity and Diversity Management will host an open house on Tuesday, Jan. 28 from 11:30 a.m. to 1 p.m. in Wilson Hall, Bldg. 1. Meet special emphasis managers Golda Philip, Federal Women's Program; and Tyrone Banks, Asian American and Pacific Islander Program. Learn more about and share goals and visions of both programs. Sign language interpreters will be provided. For reasonable accommodation and details about the event, contact Philip at (301) 594-8401 or golda.philip@nih.gov; or Banks at (301) 451-9692 or tyrone.banks@nih.gov. Visit online at <http://oeodm.od.nih.gov>.

Hearing Loss Was Hot Topic of NIDCD's First TwitterChat

NIDCD and its health education campaign—It's a Noisy Planet. Protect Their Hearing—recently hosted its first TwitterChat to raise awareness about noise-induced hearing loss (NIHL) and to celebrate NIDCD's 25th anniversary and Noisy Planet's 5th anniversary.

Every day, we experience sound in our environment, coming from television and radio, household appliances and traffic. Normally, these sounds are at safe levels that don't damage our hearing. However, when we're exposed to harmful noise—sounds that are too loud or loud sounds that last a long time—sensitive structures in our inner ear can be damaged, causing NIHL.

The TwitterChat helped participants learn more about NIHL and how to reduce the risk of NIHL for themselves, their families and community. The National Institute for Occupational Safety and Health, part of the Centers for Disease Control and Prevention, co-hosted the event.

Subject matter experts for the chat—Dr. Gordon Hughes, clinical trials director at NIDCD, and Dr. Rick Davis, co-team leader of NIOSH's hearing loss prevention team—answered questions from locations in Bethesda and Cincinnati.

NIDCD began the conversation with tweets about how to participate in the chat using the #NIDCDchat hash tag. During the chat, a total of 180 total accounts used the tag. Participants shared tips and resources and also answered quiz questions that were scripted for the chat. NIDCD tweeted information about NIHL, such as the causes, how many people have it and how to prevent it. Noisy Planet partners, audiolo-



Dr. Rick Davis of NIOSH participates in Twitter-Chat on noise-induced hearing loss.

gists and others interested in the chat asked about NIHL safety tips and research on the topic. The most popular retweet was about how loud sounds can damage sensory cells in the inner ear and included a diagram of the parts of the ear and where the damage happens.

Participants asked questions about NIHL, retweeted information and communicated with one another during the hour-long chat. One

eager participant tweeted a question 20 minutes before the start of the chat, seeking "tips on how to talk to relatives with hearing loss about getting hearing aids over the holidays."

The team responded with a link to NIDCD's checklist—"Ten Ways to Recognize Hearing Loss"—to help initiate a conversation about hearing loss and what constitutes a hearing problem.

Tweets using the #NIDCDchat hash tag reached an estimated 1.2 million accounts and had an estimated 12 million impressions, helping spread the word about how NIHL happens and ways to prevent it. Davis noted the "corresponding increase in visits to the NIOSH noise web page and a bump in Twitter followers for @NIOSHnoise."



NIHL expert Dr. Gordon Hughes of NIDCD ponders response.



Dr. Avery August of Cornell University

August To Discuss Discoveries in T Cell Immune Responses, Jan. 22

Dr. Avery August will discuss “Nature versus Nurture: Tuning CD8+ T cell Responses” on Jan. 22 at 3 p.m. in Masur Auditorium, Bldg. 10. His presentation is part of the NIH Director’s Wednesday Afternoon Lecture Series (WALS).

August has made critical discoveries in the area of T cell signaling. His work has focused on the Tec family of non-receptor tyrosine kinases in T cell function in the development of allergies and asthma and in the development of specific T cell populations. He has also made important discoveries on the function of eosinophils in regulating the development of allergic asthma.

For the WALS lecture, he poses the question: Are T cell immune responses more dependent on the properties of the antigen-specific receptors generated in the thymus during their development or the amount of signal that the T cell receives when the T cell receptor interacts with MHC complexes? He will address the implications of this work for the harvesting of T cells for immune responses against invading pathogens, including cancer.

Since 2010, August has held the position of professor of immunology and chair of the department of microbiology & immunology at Cornell University College of Veterinary Medicine. Prior to Cornell, he was a distinguished professor of immunology in the department of veterinary & biomedical sciences and director of the Center for Molecular Immunology

& Infectious Disease at Pennsylvania State University, where he started as an assistant professor in 1999.

August received a B.S. in medical technology from California State University at Los Angeles and, after earning his Ph.D. in immunology from the Weill Cornell Graduate School of Medical Sciences, was a postdoctoral fellow at Rockefeller University. He also served on the publications committee for the *Journal of Immunology* and on the committee for public affairs for the American Association of Immunologists. NIH has funded his program’s research on regulation of T cell activation and the development of lung immune responses since 2000.

August has also made important contributions to the training of underrepresented minorities in the sciences, working with and developing programs to enhance their participation. He developed the first NIH-funded Bridges to the Doctorate Program at Penn State, a collaboration between that school and Alcorn State University in Mississippi.

There will be a reception and an opportunity to talk with the speaker in the NIH Library following the lecture. 🗨️

Fogarty, Partners Celebrate Decade of Global Neuroscience Research

Fogarty and its NIH partners will mark a decade of support for brain disorders research and training in developing countries at a 3-day symposium Feb. 11-13 at Natcher. The meeting will focus on the accomplishments of grantees funded by Fogarty’s Brain Disorders in the Developing World: Research Across the Lifespan (BRAIN) program. The agenda features lessons in research capacity-building.

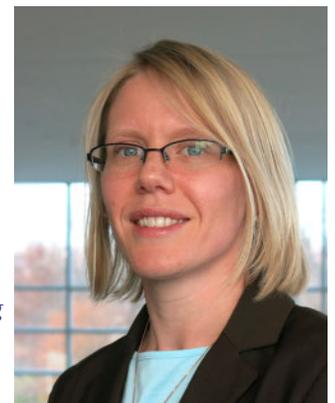
Attendees will share insights on a wide range of topics, including the influence of environmental pollutants and toxins, infectious diseases, trauma and injury, genetics, nutrition and ways to address disorders and deficits with interventions and rehabilitation across the lifespan. Grantees will also discuss ways to address gaps in the current research portfolio, as well as new directions and opportunities for neuroscience in low- and middle-income countries. Keynote speakers include former Fogarty director and Boston University associate dean for global health Dr. Gerald Keusch and Dr. Steven Hyman, former NIMH director who now directs the Stanley Center for Psychiatric Research at the Broad Institute of MIT and Harvard and is president-elect of the Society for Neuroscience.

The BRAIN effort has supported more than 140 collaborative research projects in 30 countries, with the long-term goal of building sustainable capacity in research areas related to nervous system function and impairment throughout life. NIH funding partners for the BRAIN program are NIA, NICHD, NIAAA, NIDA, NIEHS, NINDS, NIMH and ODS.

For more information on the symposium, visit <http://bit.ly/BRAIN10>.

Faupel-Badger Joins Staff at NIGMS

Dr. Jessica Faupel-Badger recently joined NIGMS as a program director in the Division of Pharmacology, Physiology, and Biological Chemistry, where she directs the Postdoctoral Research Associate (PRAT) Program and administers Pathway to Independence Awards. Before coming to NIGMS, she served as a senior biomedical scientist and deputy director of the Cancer Prevention Fellowship Program at NCI. Prior to that, she was a health science policy analyst at NIDDK. Faupel-Badger earned a B.S. in biology from Gettysburg College, a Ph.D. in tumor biology from the Mayo Clinic College of Medicine and an M.P.H. in epidemiology and biostatistics from George Washington University. She conducted postdoctoral research at NCI, where she currently serves as an adjunct investigator in the Division of Cancer Epidemiology and Genetics.



GATES

CONTINUED FROM PAGE 1

soft Corp., recounted how he entered the global health field. While he and his wife Melinda were deliberating over what causes to support, they came across an article on a diarrheal disease caused by rotavirus that was killing hundreds of thousands of children in developing countries. At the time, the vaccine was only available in wealthy nations. The story inspired them to champion the cause of infant and child health in poorer countries.

Since its launch in 2000, the Bill and Melinda Gates Foundation has contributed more than \$28 billion toward research and delivery of vaccines, other global health and development priorities around the world and education initiatives in the United States.

Gates said, “Over time, the cost of making most vaccines will get down to 20 to 25 cents per child treated and yet it can give you lifelong protection.”

One of the Gates Foundation’s first endeavors was investing in the Global Alliance for Vaccines and Immunization (GAVI), a public-private partnership that distributes vaccines to children in the world’s poorest countries. By buying vaccines in bulk from manufacturers, GAVI makes them available at low cost, which so far has benefited more than 400 million disadvantaged children globally.

“Anything that helps vaccines—understanding adjuvants, manufacture, making them at lower cost—those are things that really have a huge effect on global health,” Gates said.

The Gates Foundation is working with GAVI and other partners on several key vaccination initiatives. An urgent priority is the Global Polio Eradication Initiative led by the World Health Organization, which aims to eradicate polio globally by 2018. Gates noted distribution hurdles in Pakistan, Afghanistan and Nigeria, but technology such as satellite maps and GPS tracking are helping aid workers find remote villages in need.

Gates also said most children worldwide receive a pentavalent vaccine, a single shot containing 5 vaccines: diphtheria-tetanus-pertussis, hepatitis B and *Haemophilus influenzae* type B. GAVI is also expanding coverage of rotavirus and pneumococcus vaccines. During the remainder of this decade, Gates estimated these 2 vaccines will save more than 2.3 million lives.

“It’s the basic science work that you do that’s made this all possible,” said Gates. He paid homage to decades of NIH research that has enabled such advances in vaccinology and other interventions to promote global health.

Over the past half-century, biomedical innovation has decreased the mortality rate of children younger than 5, from 25 percent down to 5 percent. But with more than 6 million children still dying annually, there’s much more work to be done, he said. “I believe with the right kind of research that all of you are involved in and the right type of delivery activities,” said Gates, “we can get this number down below 3 million in the next 15 years.”

Together, NIH and the Gates Foundation fund more than half of all global health R&D. Gates expressed hope that others will recognize the magnitude of this task and help support the cause.

“Investing in research has huge paybacks,” he said, “paybacks in improving the human condition, paybacks in reducing health costs as you get new tools...Innovation is the solution to make sure medical costs don’t expand.”

There’s been a surprising but positive correlation between vaccinations and population growth. Gates noted as vaccines become more widely available and child health is improving in developing countries, families are choosing to have fewer children. This trend has had a stabilizing social and political impact in these countries, he said, from nutrition to education to employment.

Gates reiterated the need for more research on vaccines, better nutrition and fewer preterm births to help further decrease infant and child mortality. He spoke optimistically about the prospect for an HIV vaccine and of medical and technological advances to come. During Q&A he said, “The promise of the new tools we’ll get over this next decade are pretty phenomenal.”

During his NIH visit, Gates toured a TB lab in Bldg. 33, met with institute directors and spoke to members of the press. Following the lecture, Gates, NIH director Dr. Francis Collins and NIAID director Dr. Anthony Fauci headed to the White House for an event to mark World AIDS Day. ●



Gates (l) and NIH director Dr. Francis Collins engage in a dialogue on the Masur Auditorium stage during the second half of the annual Barmes Lecture.

PHOTOS: BILL BRANSON, ERNIE BRANSON



NIDDK director Dr. Griffin Rodgers (l) and scientist emeritus Dr. Peter Bennett at Grand Rounds

NIDDK Researchers Chronicle Advances Against Sickle Cell Anemia, Diabetes

By Eric Bock

At a recent Clinical Center Grand Rounds, NIH researchers reviewed progress made against two major causes of illness and death. NIDDK scientist emeritus Dr. Peter Bennett discussed his work over the past five decades identifying risk factors for type 2 diabetes in Arizona's Pima Indian community and NIDDK director Dr. Griffin Rodgers described advances against sickle cell anemia.

Sickle cell anemia is a hereditary blood disorder that primarily affects people of African, Middle Eastern and Indian descent. The condition affects hemoglobin, a protein found in red blood cells, explained Rodgers. Those with sickle cell anemia produce C-shaped red blood cells that clog small blood vessels, causing oxygen deprivation, pain and organ damage.

Rodgers began the discussion. "Arguably, we know more about sickle cell anemia than we do about any other disease currently known to man," he said.

He and his colleagues study the effects of hydroxyurea, the first FDA-approved therapy for sickle cell anemia, which Rodgers helped develop in the 1990s. The drug activates the production of fetal hemoglobin, which effectively interferes with the aggregation of sickle hemoglobin inside red blood cells. The resulting inhibition of the "sickling" process alleviates painful episodes associated with sickle cell anemia. "Although hydroxyurea lessens many complications, it really isn't a cure for sickle cell disease," he said.

Results from a recent clinical trial at NIH suggest that a cure for sickle cell anemia may be possible. In nine of 10 adults who had been severely affected by sickle cell anemia, a stem cell transplant reversed the disease. A cure would require replacing bone marrow of patients with sickle cell ane-

mia with bone marrow stem cells from a healthy sibling. However, the treatment doesn't work for everyone. "Within this population, we estimate that only 25 or 30 percent of patients have eligible siblings," said Rodgers.

He said it is possible that advances in stem cell gene therapy will one day allow everyone with sickle cell anemia to benefit from the treatment.

Next, Bennett spoke about type 2 diabetes in the Pima Indians of Arizona. He was chief of NIDDK's intramural Phoenix Epidemiology and Clinical Research Branch, which began conducting cooperative research efforts with the Pimas in 1963, after scientists discovered the high prevalence of obesity and type 2 diabetes in this population.

For over 30 years, Bennett administered glucose tolerance tests to almost every Pima Indian age 5 or older. Test results showed the Arizona Pima Indians had the highest prevalence of type 2 diabetes of any group in the world—including the genetically similar Mexican Pima Indians—leading Bennett to conclude that environmental factors play a role in the prevalence of type 2 diabetes. He found that low physical activity and obesity were risk factors for the disease. Later, he found insulin resistance was another risk factor. All of these findings applied far beyond the Pima population.

He also found that children whose parents had diabetes were likelier to develop the disease earlier in life and that breastfeeding prevented the development of diabetes by almost 60 percent. Bennett's achievements in the field of diabetes research continue to be the foundation for the prevention, diagnosis and treatment of type 2 diabetes. 📌

NIH Boosts Grant-Earning Capacity in Africa

NCI's Center for Global Health, in collaboration with the South African Medical Research Council, recently held a Sub-Saharan Africa regional grant-writing and peer review workshop to encourage Sub-Saharan investigators to address public health issues through research. The workshop was held in Johannesburg, South Africa.

The objectives were to increase the participation of Sub-Saharan African scientists from low- to middle-resource countries in research grantsmanship; develop strategies for sustainable research support and collaborations; and utilize competitive research as a tool to address global health issues.

There were 63 participants from 17 countries in Sub-Saharan Africa. They were selected through a competitive process that included evaluation of more than 600 applications. During the 3-day workshop, faculty presented on topics such as identifying funding opportunities, developing and presenting research ideas, writing a grant application and how the grant peer review process works.

The inception of the workshop was the result of development and implementation of a similar workshop in Latin America (Bogota, Colombia) in June 2012 where scientists from 12 countries were represented. As a result, grants were submitted and awards are yet to be determined by NIH, Wellcome Trust, USAID and WHO.



Biomedical researchers from Sub-Saharan African countries attend public health workshop.

Then and now: Taylor looks at a photo of herself and Rosenberg taken in 1984 (and reproduced at right). She said, “I will be forever grateful to not only Dr. Rosenberg but all the hard-working folks at NCI.”

PRESENT-DAY PHOTOS:
ERNIE BRANSON



TAYLOR

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worldwide headlines in December when researchers in Philadelphia announced stunning regressions in cases of leukemia. *Science* magazine labeled cancer immunotherapy its 2013 “Breakthrough of the Year.”

Taylor returned to NIH for the first time in about a decade on Dec. 12 to be filmed with Rosenberg by producers of an upcoming PBS documentary on the history of cancer. Overseen by Ken Burns, the project is due to air in spring 2015 as a 6-hour series based loosely on Siddhartha Mukherjee’s book *The Emperor of All Maladies*.

Rosenberg, who came to NIH in 1974 fresh out of a residency in surgery to become chief of the Surgery Branch, saw a toughness in Taylor, a Navy officer, that made him think that much of the tinkering he had done with IL-2 dose and frequency, among other modifications, in previous patients, could be ramped up in her.

“We gave her a very vigorous treatment,” he recalls. “More intensive doses, more frequently. And it resulted in a complete disappearance of her cancer, which has persisted for 28 years.”

Taylor’s remission was a media sensation and was

documented in a *New England Journal of Medicine* paper, on 25 patients, that landed Rosenberg on the cover of *Newsweek* in 1985. “That paper is one of the most highly cited papers in the oncologic literature,” Rosenberg said.

But media favor, then and now, was not easily won.

Taylor, a native of Wichita Falls, Tex., was a 29-year-old naval officer posted to the Defense Intelligence College when she noticed a suspicious mole on her back.

“I had the doc check it,” she recalls. “You know you’re in trouble when you start seeing a lot of [doctors] fast.”

The mole was surgically removed and Taylor was advised that she had a 50-50 chance of recurrence.

“I made it through school and became flag secretary to an admiral on Guam,” she recalls. “I was there for 3 months when the melanoma came back—three [tumors] on my arm.”

A surgeon biopsied the lumps, confirmed a diagnosis of melanoma and arrangements were quickly made to fly Taylor back to the states.

NCI’s Surgery Branch Pioneers Fourth Anti-Cancer Modality

In July 2014, NCI Surgery Branch chief Dr. Steven Rosenberg will celebrate his 40th year in that position. When he began his career, the anti-cancer armamentarium included three weapons—surgery, radiation and chemotherapy. His branch has added a fourth—immunotherapy. Key milestones in that field include:

✔ **1985** *New England Journal of Medicine* report on Linda Taylor; IL-2 was the first effective reproducible immunotherapy for the treatment of cancer (approved by the FDA for metastatic renal cancer in 1992 and melanoma in 1998).

✔ **1988** *NEJM* article on TIL (tumor-infiltrating lymphocyte) therapy for cancer reported by Rosenberg’s team; it now induces complete durable regression of metastatic melanoma in up to 40 percent of patients.

✔ **1990** Rosenberg’s team is first to introduce foreign genes into humans.

✔ **2003** Rosenberg’s team reports, in *Proceedings of the National Academy of Sciences*, the first use of a checkpoint inhibitor, anti-CTLA4, to mediate cancer regression in patients.

✔ **2006** Rosenberg’s team publishes in *Science* the first report using genetically engineered cells to treat any cancer (in this case, melanoma).

✔ **2010** Rosenberg’s team reports, in the journal *Blood*, on the first genetic engineering of lymphocytes—adoptive cell transfer—to treat lymphomas using chimeric antigen receptors (CAR).

✔ **2013** Researchers in Philadelphia report complete remissions of leukemia using CAR therapy pioneered in NCI’s Surgery Branch. *Science* magazine lauds cancer immunotherapy as “Breakthrough of the Year.”

She had wanted to go to an Air Force hospital in Biloxi, near her family in Pensacola, Fla., but an admiral overrode her decision and sent her to Bethesda's naval hospital.



Taylor was on campus to be interviewed by PBS for an upcoming series on cancer.

“Just by luck, one of the NIH docs was over doing rounds at Navy,” Taylor remembers. She enrolled in an NCI trial being conducted at a small hospital—no longer in operation—at NCI-Frederick. Researchers tried giving interferon and then injecting a monoclonal antibody directly into melanoma lesions.

“My quality of life was out the window,” said Taylor. “I could barely function.” Billed at a nearby hotel during that trial, she says, “To this day, I’m not keen on staying at Sheratons.”

Within a month it was clear that treatment was failing. “The doctors sat me down for a heart-to-heart and said, basically, ‘We don’t have anything for you.’ They said it was a good time to make what we now call a bucket list.”

Taylor was advised that she had 3 months to live, a figure that was later revised to 17 months when tests revealed no major organ involvement. “I was thrilled to get any additional time I could,” she explained. “It’s just that the doctor said it to me with such enthusiasm, but all I could comprehend was that life as I knew it was over.” Her official Navy personnel file was marked “Death Imminent.”

One of the Frederick researchers knew of a new trial being conducted by Rosenberg in Bethesda. But Taylor, with lumps all over her body, had resigned herself to the grim prognosis.

“It took some coaxing from my family” to give Rosenberg’s protocol a try, she recalls. “I didn’t feel that I was giving up. I just felt like I was facing reality.”

Taylor smiles when she remembers first meeting Rosenberg. “He was like Mister Rogers: ‘Come on up to the neighborhood—check it out.’”

Her mission-oriented military toughness began to emerge. “I decided to go into it full-fledge...I’m not one of those people with high expectations. I came with a certain peace of mind. My mom said, ‘Why not try this?’ so I came determined to give it my best shot.”

Taylor was surprised at how big-league NIH was compared to the outpost in Frederick. “It was far more formal and laborious than the little, laid-back Frederick crowd. I had all these tests, and a case

manager. I remember them asking me, ‘Do you have any fears or concerns?’ By that point, I thought it was the most ludicrous thing I’d ever heard. ‘No! I don’t have any at all!’

“I finally saw Dr. Rosenberg. He was very soft-spoken, very friendly, going through this list of everything that could go wrong—‘The kitchen sink’s gonna fall on you’—but it didn’t matter to me. He admitted that they had had no success to date.

“What really resonated with me was when he said, ‘I don’t know of any other option you have.’ I thought, well, okay...”

She was in a treatment room in old Bldg. 10 when Rosenberg told her that they were going to dramatically escalate the doses of IL-2. She looked up at a mural on the ceiling, which reminded her of the décor in a scene from the Charlton Heston film *Soylent Green*. “It looked like this room where they gave people lethal injections. I thought, ‘My God, I think I’ve picked the wrong program!’ But I think I picked the right program after all.”

Rosenberg was so concerned about potential side effects of therapy that Taylor was assigned a 2-person team: a nurse and a clinical fellow. “I was the big rat,” laughs Taylor.

To keep her busy and distracted, they made her choose a crafts project. “I picked a rug to hook,” said Taylor. “That’s so not like me.”

Treatment was, as predicted, tough. “I just sort of took each day at a time,” said Taylor. “I had to regroup. For the apheresis [harvesting of blood cells that would be treated then returned to her body] they had these gigantic needles. I would lay there for 3 hours. You kind of get numb after a while.”

“We gave her more IL-2 than we had given any other patient,” Rosenberg said. “Linda was tough. Not a lot of people could have withstood the treatment.”

Taylor developed fever, chills, the shakes. “I had unbelievable fluid retention. I felt, like, squishy when I walked. Then I wasn’t walking at all. But I don’t remember ever wanting to quit. Obviously, it was incredibly hard for me.”

She remembers becoming enraged at the noises made by a fellow patient’s toy monkey. “Normally I don’t agitate easily,” she said. “I had a tremendous amount of trouble breathing.”

“That was the cytokine storm,” explained Rosenberg; IL-2 therapy induces a massive innate immune response that can cause, as it did in Taylor, pulmonary edema. Researchers have since learned to tamp down the reaction. “We learned from Linda,” he said.

Taylor was intubated for one night for the edema, which soon resolved. In December 1984, she went home to Pensacola in stable condition, but full of apprehension about what was happening inside her body.

A month later she returned to Bethesda. There were no new lumps, but the old ones—which covered her body—had not disappeared. A biopsy of one indicated that the cells inside were dead. “But nothing else changed, there was no shrinkage,” Taylor said.

On her second visit to NIH a month after that, “I could tell that they were smaller,” she said. Adds Rosenberg, “By the third or fourth month, they were all gone.”

Taylor then asked Rosenberg “the monumental question: ‘What does that mean for me?’ He just looked at me and said, ‘I don’t know, we’ll just have to see.’”

Taylor’s eyes fill as she recalls, “I came with peace. But I just thought ‘I don’t know where I am.’ It was always very scary to come back.”

On the off-chance she might live, Taylor started an M.B.A. The Navy, which had

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put her on temporary disability retirement, was bureaucratically unequipped to deal with a medical miracle; it had no game plan for undoing “Death Imminent.”

It took the intervention of a lawyer, an admiral, a congressman and the Secretary of the Navy to reinstate her to active duty, a labor that somewhat embarrasses Taylor because “I used to handle congressional correspondence in the Navy, and I hated it when people did that.” But regaining her professional identity, and feeling of self-worth, was crucial to her. Being reinstated, she said, “saved my life.”

After being cancer-free for more than 3 years, Taylor went on to become executive officer at Naval Station Pearl Harbor, then XO at Subic Bay (Philippines), then postings in Japan and throughout the Far East. She rose to the rank of captain, which, ironically, placed her in a tie with Rosenberg, who topped out as a captain in the Public Health Service.

Taylor retired in 2001 after 24 years in the Navy. Though she never became a flag officer, she held two command positions: “I wanted command so bad—I wanted it more than anything else. To have two was over the top.

“[But] my mom wanted me to come home—she said, ‘Enough’s enough.’”

During her Navy years, Taylor earned three masters degrees and made two trips to Europe. She now runs a property management company with her brother in Florida.

Rosenberg says the therapy that Taylor withstood over the course of a month at NCI in 1984 now takes only 4-6 days of hospitalization, with significantly fewer side effects. “It’s much easier now... Thousands of people have now been saved by this therapy,” he said. “Linda doesn’t realize how important she is to the history of cancer treatment.”

Though she admits “the fear factor is still real high,” Taylor has had no symptoms over the succeeding years.

“The T cells we modified are still working in your body,” Rosenberg tells her.

“Keep working!” laughs Taylor.

“You won this battle,” says Rosenberg.

Answers Taylor, “It was a tough one.”

Cancer may be the emperor of all maladies, but every once in a while a captain beats an emperor.

To learn more about the upcoming PBS series on cancer, visit www.emperorofallmaladies.org/. 🎬



Rosenberg and Taylor playfully josh one another about who had the higher rank; both topped out as captains in their respective services.

Longtime Printing Specialist Pair Retires

After 41 years of government service in printing—20 at NIH—David Pair begins part two of his life: retirement.

He started his government service in October 1972 in the print shop at the National Aeronautics and Space Administration in Washington, D.C., as a laborer and moved to printing procurement, where his career in printing began. Printing and color were soaring at the time and Pair wanted to move up in the industry. While working full time he went back to school to learn about the field and it paid off. In 1982, he was promoted to a color specialist position at NASA headquarters.

In 1992, Pair saw an opportunity to work in the NIH Printing and Reproduction Branch. After a few years, he was given the task of creating a program to procure printing and save money for the institutes without going through the Government Printing Office. The program proved to be valuable at NIH: Print products were delivered in a shorter time with a larger savings per year.

In 2000, Pair became lead printing specialist for NIH. Over the years, he has overseen printing of the *NIH Record*, *NIH News In Health*, *Clinical Center News* and *NIH Catalyst*. He has worked with most of the institutes to print various health brochures for patients and the public. Pair feels good about the printing services he helped create and make available to NIH in the past 20 years.

A native of Washington, D.C., he graduated from Calvin Coolidge High School in 1972. He lives in Gaithersburg and owns his family home in D.C. He says retirement will give him more time for his love of fishing with his long-time buddies. He plans to begin some new projects at his D.C. home.

“I love sports,” he said. “I coached a baseball team during my career at NASA. I support the Nats, go Caps and hail to the Redskins—and I do enjoy the big-screen TV to watch a good game.”



milestones

Schneeweis Named NEI Deputy Scientific Director

Dr. David Schneeweis will help direct the National Eye Institute intramural research program, which includes 26 principal investigators and tenure track investigators and about 275 scientific support staff. In addition to managing day-to-day operations, he will oversee the NEI intramural training program, consisting of about 100 trainees.



Schneeweis is a vision scientist with a background studying cell signaling in primate retina. He earned his Ph.D. in biomedical engineering from the University of Michigan and trained as a postdoctoral fellow at the University of California, San Francisco, in the laboratory of Julie Schnapf. He brings to NEI a range of research, training and administrative experience from positions held at the Smith-Kettlewell Eye Research Institute in San Francisco, the University of Illinois at Chicago and most recently Northwestern University, where he administered a large, interdepartmental neuroscience Ph.D. program.

“With his scientific background, extensive experience in science administration and a passion for mentoring, we look forward to working with Dr. Schneeweis with great enthusiasm,” said NEI scientific director Dr. Sheldon Miller.

NINDS Mourns Scientist Emeritus Albers

By Shannon E. Garnett

Dr. R. Wayne Albers, 85, scientist emeritus and retired chief of the section on enzyme chemistry in the NINDS Laboratory of Neurochemistry, died Sept. 28.

Albers was a world-recognized neuroscien-



tist most noted for his research in the field of membrane cation transport and neuronal excitability in the nervous system. According to his colleagues, he was known as a scientist’s scientist, had an insatiable curiosity about the natural world and was thoroughly committed to a life of science. He was always generous with his time and advice to young people and was a valuable mentor to many young scientists at NIH.

“Wayne was an extraordinary investigator and a resource for all NINDS intramural investigators,” said NINDS director Dr. Story Landis. “He liked nothing better than to talk about science and help solve difficult problems.”

Albers earned his undergraduate degree from the University of Nebraska in 1950 and his doctorate from Washington University School of Medicine in 1954. His mentor was the renowned biochemist Dr. Oliver Lowry. After receiving his Ph.D., Albers immediately accepted a full-time position at NIH in the Laboratory of Neuroanatomical Sciences, NINCDS (now NINDS). In 1963, together with two other distinguished NINDS scientists, Dr. Roscoe Brady and Dr. Donald Tower, Albers founded the Laboratory of Neurochemistry, where he went on to do ground-breaking research throughout his career.

Along with close colleague Dr. Robert L. Post at the University of Pennsylvania, Albers performed novel experiments that led to the “Albers-Post Model,” an explanation of the mechanism of action of the cation transport enzyme, known as the sodium-potassium-activated ATPase. He published extensively about this work, including a 1967 classic paper describing the model in the *Annual Review of Biochemistry*—a paper that is still relevant today.

Later, he focused on kinetics and structure-function relationships in the sodium-potassium-ATPase enzyme. Most recently his work centered on an enzyme called cdk5. This work was done in collaboration with NINDS’s Dr. Harish Pant and NIST visiting scientist Dr. Antonio Cardone.

After 57 years of meritorious service at NIH, Albers retired as scientist emeritus in 2011.

Albers was also an outstanding citizen in the scientific community. He was a founding member of the American Society for Neurochemistry and served on its council and several of its committees. He was a professor of biochemistry at George Washington University and on the faculty of the Foundation for Advanced Education in the Sciences.

Albers served as associate editor of the *Journal of Neurochemistry* and *Journal of Experimental Neurology* and on the editorial boards of several other publications including *Archives of Biochemistry* and *Biophysics and Metabolic Brain Disease*.

He was a founding co-editor of the textbook *Basic Neurochemistry: Molecular, Cellular and Medical Aspects*, first published in 1972. He continued to serve as co-editor for eight more editions; the latest was published in 2012. He twice served as acting chief of the Laboratory of Neurochemistry, from 1973-1976 and 1985-1986.

Albers is survived by his former wife, Frances; their children, Gail Morrell, Belinda Caron and Patricia Steinhoff; 8 grandchildren and 8 great-grandchildren. A son, the late Jonathan Albers, preceded him in death.

Donations toward a fund for an Albers memorial lecture or research prize may be sent to the American Society for Neurochemistry, 9037 Ron Den Ln., Windermere, FL 34786. Email asnmanager@asneurochem.org.



PIZZO

CONTINUED FROM PAGE 1

Above (from 1):

A Pizzo successor as Pediatric Oncology Branch chief, Dr. Crystal Mackall, introduces him at the Great Teachers lecture.

Pizzo shares a laugh with former colleagues Dr. Fred Gill (l) and Dr. Harvey Klein.

Below:

Well wishers (from 1) CC senior investigator Dr. Harvey Alter, NHLBI's Dr. Neal Young and NHLBI deputy director Dr. Susan Shurin greet the former NIH'er who helped transform the prognosis for childhood cancers.

PHOTOS: BILL BRANSON



of those galvanizing changes in life that really altered my career and who I think I am as an individual," said the former resident, Dr. Phil Pizzo, now also former dean of Stanford medical school and former chief of NCI's Pediatric Oncology Branch.

Teddy, Pizzo explained, had a severely compromised immune system. He'd been diagnosed with aplastic anemia at age 10. For his health, he was isolated from family, friends and virtually all human contact. Teddy survived 8 more years—vigorously protected from potential pathogens—in a specially ventilated, see-through case about the size of a large bathroom.

"He grew up and I grew with him," Pizzo recalled. "He was an exemplar of resilience, at the most significant and fundamental level. We learned a lot from Teddy."

Forty years after his arrival in Bethesda, the investigator returned to NIH recently, with an overview of lessons learned and an abundance of perspective. Part of the Contemporary Clinical Medicine: Great Teachers lecture series, his talk offered a unique glimpse "at the subtext behind the headlines" of a career chock full of headlines. Pizzo attributed much of his success to his time spent at NIH.

"There has not been an environment in my life and career more formative and more important than this institution," he said. "It really is an incredible place."

One of Pizzo's successors as POB chief, Dr. Crystal Mackall, introduced him as someone who "put the Pediatric Oncology Branch on the map for teaching us how to manage infections in immunocompromised hosts and the pioneering work he did for children with HIV infection."

Four qualities, she suggested, make Pizzo "a beloved and timeless leader, a role model for all of us." She noted his "driven, focused and determined" work ethic; an "incredible power to develop a vision and a boldness—he taught 'If you aren't going to envision grand success, then it's never going to happen'"; a remarkable sense of

humor; and his "ability to tell a story."

Pizzo's own story, he pointed out, may appear in retrospect to have unfolded neatly and tidily "in a linear fashion," but actually consisted of myriad, unpredictable "intertwining threads that came together." He emphasized several of those threads in particular:

Basic science. "I want to underscore the incredible importance of basic science research and how that contributes to everything that improves the lives we value so much."

Unwitting instructors. "Surprisingly, the people I felt I learned the most from were not the esteemed professors or the extraordinary faculty. They were largely the patients—those individuals who I cared for, did my personal research on—and my immediate colleagues."

Medical students formally taught to pay attention. "The listening part has proven to be extraordinarily valuable not just in terms of clinical activity but also in my role as administrator in different sectors."

The value of teamwork. "We take it for granted now, but bridging together investigators with research nurses, biostatisticians, clinical pharmacologists was at the time unique to NIH" and bolstered not only the research itself, but also the well-being of the patient.

Psychosocial components of clinical care. "The Pediatric Oncology Branch then and now has really connected the dots between humanism and patient care," said Pizzo, who had attended POB rounds that morning. "The branch still brings together those essential ingredients that allow children to go through the rigors of clinical trials in ways that are meaningful and significant."

Perseverance. "Tenacity pays off in unexpected ways," he stressed, describing early efforts to get the Children's Inn built and to develop Camp Fantastic, with unforeseen help from congressional spouses, parents of patients and private sector contributors.

Thick skin. Pizzo noted the strong protests he



Above, Pizzo discusses his experiences before, during and after his career at NIH. Below, he gathers with longtime friends (from l) NIA director Dr. Richard Hodes, CC director Dr. John Gallin and Gill, chief of the CC's internal medicine consultation service.

endured—some from staffers who threatened to quit, and did—when early in the AIDS epidemic he decided that the POB would begin to treat kids with the still-mysterious and fear-inducing disease. Witnessing in person the marked neurological deterioration suffered by several of the children convinced him. “Patients can make a difference in the way we think about new ventures,” he said. Under Pizzo’s watch, the Clinical Center was the first hospital to administer continuous AZT—“the beginning of hope,” he calls it—a landmark treatment achievement in the epidemic.

After 23 years, Pizzo left NIH in 1996 to head pediatrics at Harvard. In 2000, he was lured west to lead Stanford Medicine. After a dozen years there, Pizzo stepped down as dean in 2012 for a new phase. Now a full-time professor, he lends his voice and experience to various scientific advisory boards, advocates for biomedical research and mentors transitioning scientists. He’s also developing an exciting university-based program for life and career transition.

He speaks out frankly on vital issues. “The NIH in the intramural program—and elsewhere—needs more women leaders,” he said, vocalizing anew a topic he initiated before leaving Stanford: more flexible career paths for women physician-scientists.

Addressing stem cell research, Pizzo said it’s important that “we not let political agendas impact promising research that can truly make a difference.”

Finally, he closed with an encouragement to current NIH’ers, “I say, as someone who was part of this institution from the early seventies to the mid-nineties and now see it in full glory of the early 21st century, that you have every reason to be proud of what you do every day.”



NIBIB Partners with India on Blood Pressure Initiative

Hypertension is responsible for approximately half of all deaths from stroke and heart disease and is the second leading cause of kidney failure. Yet despite being a treatable condition, hypertension goes untreated in one in three adults worldwide. One explanation is that effective screening, diagnosis and management of blood pressure can be difficult to achieve using current technologies.

To address this issue, the National Institute of Biomedical Imaging and Bioengineering will commit \$2 million to fund research leading to the development of new technologies for measuring blood pressure that are unobtrusive or passive and that can automatically provide frequent feedback to both patients and health care workers. The goal is to create less expensive, less intrusive and faster technologies for measuring blood pressure than are currently available and that can be operated by untrained individuals in homes or regional care settings.

NIBIB is partnering with the Department of Science and Technology (DST) in India to leverage resources of the two countries. NIBIB will fund up to 3 projects for a maximum of 5 years.

NIBIB is specifically interested in funding technology that can be used to measure the blood pressure of large numbers of individuals—so-called high-throughput blood pressure systems. This type of system would measure blood pressure while an individual performs a routine daily activity such as walking through a doorway, checking out at the grocery store, using a key fob, holding a cell phone or interacting with an office item, as well as performing a task in a home environment.

In addition, NIBIB envisions that the future of blood pressure management will involve automatic, wireless transmission of blood pressure measurements to a patient’s electronic health record. Such a system would allow physicians to track changes in an individual’s blood pressure over time and help to determine whether a particular blood pressure medication or lifestyle intervention is working. Thus, any new technology for blood pressure measurement must be able to integrate with communications devices such as cell phones and the Internet.

NIBIB director Dr. Roderic Pettigrew points out that our current technique for measuring blood pressure—the blood pressure cuff—is more than 100 years old and is insufficient for addressing hypertension on a global scale.

“A reading taken with a blood pressure cuff at a doctor’s office—while relatively accurate—only gives a snapshot of a patient’s blood pressure status. Because blood pressure varies considerably throughout the day and from one day to the next, doctors are missing the full picture,” said Pettigrew. “To effectively manage hypertension, doctors need to be able to track blood pressure and its response to medications over time. From a practical standpoint, this is going to require the development of technologies that can unobtrusively and more frequently take blood pressure measurements and send them directly to a patient’s record. Simply put, to reduce rates of hypertension worldwide, we need a passive technology for measuring blood pressure.”

As part of an ongoing commitment to encourage collaborative research and technology development between scientists and engineers in the U.S. and India, the Indian government has committed to support similar research for new blood pressure technologies by Indian investigators. U.S. applicants are encouraged, but not required, to identify Indian partners to work with on their projects when submitting their applications; successful applicants may be asked to share their abstract and specific aims with the Indian funding agency so that they may fund Indian investigators who best match their U.S. counterparts.

For details, contact Dr. Vinay Pai, paiv@mail.nih.gov, (301) 451-4781.



Plotz Receives Rheumatology Medal

Dr. Paul H. Plotz (c), scientist emeritus at NIAMS, was awarded the 2013 Presidential Gold Medal from the American College of Rheumatology. The medal is the highest award the ACR can bestow and recognizes “outstanding achievements in rheumatology over an entire career.” Plotz, whose career at NIH spanned nearly 40 years, served as chief of the NIAMS Arthritis and Rheumatism Branch, scientific director and acting deputy director. He was also a senior advisor to NIH deputy director for intramural research Dr. Michael Gottesman. Plotz received the honor at the 2013 ACR annual meeting in San Diego from ACR immediate past president Dr. Audrey B. Uknis (l) and ACR president Dr. Joseph Flood.

PHOTO: ACR



Kidney Foundation Honors Rodgers

NIDDK director Dr. Griffin Rodgers (r) accepts the National Kidney Foundation's Outstanding Achievement Award from WJLA-TV news anchor Jummy Olabanji at a recent ceremony in Washington, D.C. The award recognizes Rodgers' commitment to bettering the lives of patients through research and by increasing awareness, prevention and treatment of kidney disease through the National Kidney Disease Education Program and his “Healthy Moments” radio show.



Congressional Representatives Meet With NIDDK Staff, Grantees

At the request of the Congressional Diabetes Caucus, more than 20 members of bipartisan congressional staffs came to NIH recently to learn about type 1 diabetes research and the role of NIH in improving public health.

All heard about results, current studies and future opportunities in type 1 diabetes research, including those made possible by the Special Statutory Funding Program for Type 1 Diabetes Research—a \$150 million annual appropriation that is spearheaded by NIDDK in collaboration with other NIH components and the Centers for Disease Control and Prevention.

NIH director Dr. Francis Collins spoke to the staffers about the benefits of investment in NIH, the power and promise of research and the effect of shrinking funding. “We’re on a roll,” he said, “but unfortunately we can’t be on a roll at the pace that science would allow.”

Following Collins, NIDDK director Dr. Griffin Rodgers provided an overview of diabetes and its complications and introduced speakers who presented on type 1 diabetes research being conducted in the extramural research community and in the NIDDK Intramural Research Program.

They spoke about major advances made and emerging opportunities in the fields of artificial pancreas technologies and diabetic eye and kidney diseases, among other topics. The staffers also toured two NIDDK labs and heard a patient speak about the positive impact that type 1 research advances have made on her life.

There have been “a tremendous number of discoveries and innovations that have resulted from these special funds,” Rodgers said.—Amy F. Reiter

Above: More than 20 members of bipartisan congressional staffs (shown here with NIDDK staff, researchers and grantees) came to NIH recently to learn about NIH-supported type 1 diabetes research, as well as about the benefits of investment in NIH.

Below: Congressional staffers tour the lab of NIDDK intramural investigator Dr. Sushil Rane during a recent visit to learn about advances and emerging opportunities in NIH-supported type 1 diabetes research.

PHOTOS: JEN RYMARUK

