

DOING BUSINESS BETTER Town Hall Updates Progress On ‘Optimize NIH’

BY CARLA GARNETT

At an NIH-wide town hall meeting on the effort to “Optimize NIH,” NIH principal deputy director Dr. Lawrence Tabak wanted to make one thing clear at the outset.

“There will be no reductions in force, so-called RIFs, as a result of this effort,” he said early and often throughout the hour-long event held Mar. 23 in Kirschstein Auditorium, Natcher Conference Center. “This is not about people losing jobs... Let’s put that out of play. That was the first principle we discussed with [HHS] as we’ve been working through all of this. The reason



NIH principal deputy director Dr. Lawrence Tabak at recent town hall on “Optimize NIH”

that was the first principle is because of how highly we value our workforce and how important all of you are to what we do here.”

Optimize is NIH’s response to the Department of Health and Human Services’ “Reimagine HHS” initiative to improve efficiency and effectiveness. HHS launched

Reimagine in support of a directive from the Office of Management and Budget in early 2017 to make federal government “lean, accountable and more efficient.”

NIH, the HHS agency with the greatest number of employees in the department, took up the Reimagine challenge last December, in order to design its own strategy for finding ways to work better—to optimize. The town hall was held to give background on the department’s overall initiative and to describe NIH-specific work to date, plans for implementation and future phases.

Reimagine is organized into 10 teams working on 6 strategic shifts: putting people at the center of HHS programs, restoring market forces, leveraging the power of data, making HHS more innovative and responsive, generating efficiencies through streamlined processes and moving to a 21st century workforce.

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Film highlights Navajo grantee; see p. 12.

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Dr. Jim Yong Kim (r) of the World Bank

‘OPTIMISM IS A MORAL CHOICE’ World Bank’s Kim Describes Conversion at Chat

BY RICH MCMANUS

Eighteen years before he was named 12th president of the World Bank Group in 2012, Dr. Jim Yong Kim was advocating for the bank to be mothballed; 1994 was the bank’s 50th year, and Kim thought an appropriate birthday gift that year would be to shut it down.

SEE KIM, PAGE 4



Dr. Leroy Hood describes “P4 health.”

Big Data Clouds Are Feeding Personalized Nutrition

BY DANA TALESNIK

An apple a day doesn’t really keep the doctor away, but what if you knew what did, for you personally? Are there certain nutrients that complement your unique biology? To find out, there’s a growing menu of tech tools that can help people choose foods to fit their individual needs.

This emerging field of personalized

SEE NUTRITION, PAGE 6

'Spring Into Wellness' Campaign

During the months of April through June, the Office of Research Services and the Office of Human Resources are partnering to offer a one-stop shop experience to support NIH'ers' personal and professional well-being.

Gallup research has identified five essential and interrelated elements of well-being: physical, financial, social, career and community. The Spring Into Wellness Campaign is intended to support these five elements and will highlight numerous events, both new and existing. Check out a sample of events associated with each of the elements below:

- Social: Take Your Child to Work Day on Apr. 26.
- Financial: Financial Fitness Fair on May 17.
- Physical: Take a Hike Day on June 7.
- Career: "StrengthsFinder 2.0 - Discover What You Do Best" Training on June 28.
- Community: Weekly Community Markets every Tuesday.

For a full calendar of events and more information, visit <https://wellnessatnih.nih.gov>.

Follow @NIHEmpSRvcs on Twitter for more information about services that can assist you with balancing work and family, as well as other programs and employee services to improve your well-being.

If you have any questions about "Spring Into Wellness," contact SpringIntoWellness@nih.gov.

NIH Holds 11th Annual Career Symposium

The NIH Office of Intramural Training & Education invites all NIH graduate students and postdoctoral trainees, both basic scientists and clinicians, to participate in the 11th annual NIH Career Symposium on Friday, May 18 at Natcher Conference Center from 8:30 a.m. to 5 p.m. The symposium provides an opportunity for fellows and graduate students to learn about scientific career options and to explore factors that lead to career success. This all-day program will include more than 20 breakout sessions highlighting career opportunities available to biomedical scientists.

Panel sessions cover academic, government, industry and non-profit career paths. More than 80 speakers will provide insights into their careers: what their current job entails, its pluses and minuses and how they got there. For more information and registration, visit <https://www.training.nih.gov/>.

Postbaccalaureate Poster Day 2018

Postbac Poster Day is scheduled for Wednesday, May 2. It will be held at Natcher Conference Center from 10 a.m. to 3:30 p.m. The Poster Day keynote address will begin at noon followed by presentation of Postbac Distinguished Mentoring Award(s) to NIH investigators selected by the postbacs. Poster



NIDA Event Educates on Opioids

Dr. Rita Valentino (at right, onscreen), director of the Division of Neuroscience and Behavior at the National Institute on Drug Abuse, recently presented as an expert on a closed-circuit event to chemistry students called "Opioids: Combatting Addiction with Chemistry." The event, part of the American Chemical Society's "Program-in-a-Box" series, explained what makes opioids so addictive, the treatments and medications used to help those who suffer and profiled the work that chemists are doing to make prescription painkillers safer and harder to abuse. More than 6,100 students took in the event, including 14 chemists (above) from the University of Puerto Rico in Mayagüez.

PHOTOS: ACS UPR-MAYAGÜEZ, ACS UNIV. OF N. FLORIDA



session I will take place from 10 a.m. to noon and poster session II is from 1:30 to 3:30 p.m.

Postbac Poster Day provides an opportunity for postbacs to share the research they have been conducting at NIH and at the same time develop their scientific communication and networking skills. Posters will be reviewed by teams composed of graduate students, postdocs and staff scientists/clinicians. The authors of the top 20 percent will receive a letter acknowledging their accomplishments.

Investigators, staff scientists and scientific administrators can make an important contribution to the event by visiting posters and engaging the authors in discussion. For more information, visit https://www.training.nih.gov/postbac_poster_day.

Webinar on Designing, Analyzing Individually Randomized Group-Treatment Trials

The NIH Office of Disease Prevention will present a Mind the Gap webinar: Design and Analysis of Individually Randomized Group-Treatment Trials in Public Health on Tuesday, Apr. 24 from 11 a.m. to noon. The speaker is Dr. Sherri Pals, a mathematical statistician at the Centers for Disease Control and Prevention.

Individually randomized group-treatment trials are studies in which individual participants are randomly assigned to study conditions, but treatment is administered in groups. Because participants share a group environment and interact with each other, observations taken on participants may be correlated within treatment groups.

In her work in domestic and international HIV/AIDS and tuberculosis, Pals has designed and analyzed numerous trials and enjoys teaching and mentoring others in this area.

She will accept questions during the webinar via WebEx and Twitter. Use the hashtag #NIHMtG. Registration is required and can be done at <https://nih.webex.com/nih/onstage/g.php?MTID=ef383b63024e37a27600d7aa369809085>. 



Dr. Sherri Pals



At the recent national summit in Atlanta, NIH director Dr. Francis Collins announces the HEAL initiative. NIDA director Dr. Nora Volkow also spoke at the event.

PHOTOS: CHRIS WILLIAMS ZOEICA IMAGES



NIH Launches HEAL Initiative to Stem Opioid Epidemic

At the 2018 National Rx Drug Abuse and Heroin Summit on Apr. 4 in Atlanta, NIH director Dr. Francis Collins announced the launch of the HEAL (Helping to End Addiction Long-term) Initiative.

HEAL is an aggressive, trans-agency effort to speed scientific solutions to stem the national opioid public health crisis. NIH is nearly doubling funding for research on opioid misuse/addiction and pain from approximately \$600 million in fiscal year 2016 to \$1.1 billion in fiscal year 2018, made possible by a funding boost from Congress.

“Every day, more than 115 Americans die after overdosing on opioids,” said Collins. “That is

a four-fold increase since 2000, and the numbers continue to climb. NIH has been deeply invested in efforts to counter this crisis through research, but we are determined to do even more.

“Over the last year,” he continued, “NIH has worked with stakeholders and experts across scientific disciplines and sectors to identify areas of opportunity for research to combat the opioid crisis. The focus of these

discussions has centered on ways to reduce the over-prescription of opioids, accelerate development of effective non-opioid therapies for pain and provide more flexible options for treating opioid addiction. NIH is committed to bringing the full power of the biomedical research enterprise to bear on this crisis.”

HEAL will bolster research across NIH to prevent addiction through enhanced pain management and improve treatments for opioid misuse disorder and addiction.

“Science and technology have illuminated our understanding of the mechanisms underlying addiction,” said

Dr. Nora Volkow, director of the National Institute on Drug Abuse, who also attended the summit. “With these additional resources, we can develop more customized, high-quality treatments for addiction and pain, as well as harness implementation science to bring evidence-based changes to our health care system, including treatment for those in the criminal justice environment.”

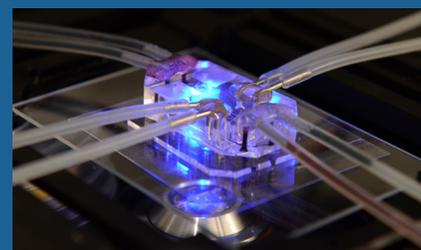
“NIH has been deeply invested in efforts to counter this crisis through research, but we are determined to do even more.”

-DR. FRANCIS COLLINS

HEAL will build on extensive, well-established NIH research that has led to successes such as the development of the nasal form of naloxone, the most commonly used nasal spray for reversing an opioid overdose; the development of buprenorphine for the treatment of opioid use disorder; and the use of nondrug and mind/body techniques to help patients control and manage pain, such as yoga, tai chi, acupuncture and mindfulness meditation.

The initiative also will tap into the expertise of the NIH Pain Consortium, which was established to enhance collaboration among NIH institutes, centers and offices that conduct pain research.

For more information about HEAL, visit <https://www.nih.gov/heal-initiative>. 



ON THE COVER: Lung on a chip. Combining microfabrication techniques with modern tissue engineering, the lung-on-a-chip offers new in vitro approach to drug screening by mimicking mechanical and biochemical behaviors of a human lung.

IMAGE: WYSS INSTITUTE, HARVARD UNIVERSITY (SUPPORTED BY NIH COMMON FUND & FDA)

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National Institutes of Health
Turning Discovery Into Health

Kim

CONTINUED FROM PAGE 1

In those days, as one of the founders, along with Dr. Paul Farmer, of Partners in Health (PiH), a global health group with origins at Harvard University, Kim considered the World Bank a dinosaur. By insisting on strict repayment schedules, the bank was forcing poor countries that had borrowed money into austerity measures that hurt the poor. Desperately needed funds were taken from health care and education to pay back creditors.

In a chat onstage Mar. 12 in Masur Auditorium with NIH director Dr. Francis Collins, Kim described his conversion from M.D./Ph.D. anthropologist with front-line experience combatting infectious diseases among the world's poorest populations to unexpected bank president whose keen eye for the needs of the world's developing nations trumped his dearth of financial expertise.

'Something Like a Movement'

There was a good reason that warm and sustained applause greeted Kim as he took the stage for his interview. For the previous hour and 41 minutes, the audience had watched the film *Bending the Arc*, which traced PiH's development from its genesis in late-night dormitory conversations in Cambridge to crucial, even heroic, interventions in Haiti (first for tuberculosis, then HIV), Peru (multidrug resistant TB) and Rwanda (Ebola).

In perhaps the film's emotional zenith, Kim recounts with tearful astonishment the recovery of a young Peruvian man whose advanced MDR-TB was cured by PiH physicians. This was only after much of the world, including authorities in the United States, had argued that such cases should be allowed simply to run their course, too expensive to address.

"With Paul Farmer and others, I learned how to take social justice and turn it into real work on the ground," says Kim in the film, noting that the Catholic church's liberation theology provided the moral buttress for work many of their peers thought was hopeless, maybe even crazy. "We realized that this could be something like a movement."

Along with activist Ophelia Dahl and

others, the Harvard grad students believed that "there was no such thing as a basket-case country," said Kim.

Known for his comment, "Optimism is a moral choice," Kim put that observation in context: "Pessimists will probably live out their own very low ambitions," he said. "The key for me today is to have pessimism of the intellect, but optimism of the will."

Noted Dahl in the movie, "So much of this work is built on love."

Collins Conducts Interview

Once the film ended, Collins' first question was about the power of an individual patient to become the start of "big, bold programs."

"We learned early on that you can't do this work unless you allow your soul to be fractured," said Kim. "If you can shrug it off, Partners in Health is probably not for you."

When he first went to Haiti, Kim found "bodies that reflected all of the ills that the world has to offer...It made us humble, but it also made us angry...We were determined to stick with people who had been abandoned."

The PiH team reflected long and hard on the best approach to human suffering, he said. "Would it be cost-effectiveness? We rejected that analysis. We were inspired by liberation theologians to stand by and be with the poor, to see the world from their perspective. Many people are unwilling to do so."

Asked if he and Farmer always agreed on things, Kim said, "We argued all the time. To this day we argue intensely about things, but

our moral foundations are built on the same architecture."

For example, when World Bank assistance was sought for the Ebola crisis of 2014, Kim's first call was to Farmer. His second call was to NIAID director Dr. Anthony Fauci.

"The board voted 25-0 to fund the work," Kim reported.

Noting that "the World Bank used to be your enemy," Collins asked, "How did you end up being in charge of the place?"

Kim responded that one of his predecessors, James Wolfensohn, had already begun to change the bank's culture.

First, Grow Rich

"The original idea of the bank was, first grow rich, then invest in things like health and education," said Kim. That view has evolved, he explained, as the world's finance ministers have come to appreciate the work of people like Dr. Chris Murray, whose studies on the global burden of disease have been eye-opening. "Investment in health and education—not hard infrastructure—is the best driver of economic growth," Kim said.

"So is [your work] all exhortation?" wondered Collins.

"That's the last argument I had with Paul," Kim replied, "—what the bank should do."

Knowing that heads of state and finance ministers are keenly aware of how they stack up against their peers, the World Bank has commissioned the Human Capital Index, which Kim expects will pack a punch.



NIH director Dr. Francis Collins (l) interviewed Kim, who said, "Human capital is the most important driver of economic growth—that's what we believe."

PHOTOS: CHIA-CHI CHARLIE CHANG

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“They pay attention if you rank them,” he said. “No one wants the shame of being ranked lower than a nation you felt superior to.”

Among the metrics is learning-adjusted years of education vs. actual years of education. A year of education in Singapore, for example, is worth 2 years of education in Yemen.

“Once the rankings come out, that will get their attention,” said Kim, who hopes the index will spur self-funding initiatives and grow indigenous political will.

Kim said even a well-funded bank can’t come close to solving such challenges as the estimated \$3 trillion it would take to tackle the world’s sexually transmitted diseases alone.

The Robots Are Coming

Kim sees a world where automation—robots and 3-D printing, for example—is expected to result in loss of half the world’s jobs.

“This is just nuts—it’s an absolute emergency,” he said, particularly for poor countries dealing with stunting in both education and human development. “What are these people going to do? We already have machines that can go down a row of strawberries and raspberries and just pick the strawberries.”

Kim said Chinese entrepreneur Jack Ma of the tech conglomerate Alibaba Group has predicted that all muscle-power jobs and all knowledge jobs “will be done by machines very soon...People won’t spend nearly as much time working...What’s going to happen in Africa? I don’t know, I just don’t know. We need NIH to teach us what people can do.”

Kim is heartened by the prediction that, by 2025, broadband communications will be truly global, “and then aspirations will skyrocket. That’s my obsession these days.”

He concluded, “Human capital is the most important driver of economic growth—that’s what we believe. How do you make the system, as is, work for everybody on the planet?”

He cautioned, “Don’t drop what you’re doing and become Paul Farmer,” suggesting that his friend Farmer is the only one who could successfully pull that off. But Farmer loves what he’s doing, said Kim, “so you should do every day what you absolutely love to do.” **R**

Earth Day Event Addresses Plastic Film Pollution

The theme for Earth Day 2018 is “End Plastic Pollution.” The Division of Environmental Protection (DEP) is taking a subset of the theme and creating fun activities for children who will visit campus for the joint Earth Day/Take Your Child to Work Day event on Thursday, Apr. 26.

Everyone is encouraged to stop by the DEP table at Natcher Bldg. to feed the Plastic Bag Monster collection container with clean and empty plastic bags that might normally be tossed in the trash. Visitors to the table can also participate in interactive games and win a prize.

Plastic is everywhere. The EPA reports that in 2012, plastics totaled 32 million tons, or 13 percent, of the waste stream. Of this amount, only 9 percent was recycled. Globally, polyethylene (PE) is the most prevalent type of plastic. PE is used to make shrink wraps and other types of thin films, including grocery bags, dry cleaning bags and Ziploc bags. Americans use 100 billion PE bags annually, averaging only 12 minutes of use. However, the lifespan of the bags in landfills and the environment is several hundred years.

The light weight and flexible form of plastic film has its disadvantages. Many bags are blown out of general curbside waste bins or landfills and end up in the environment. Plastic films do not decompose; they photodegrade into microplastics only millimeters wide. These tiny pieces become airborne and get blown into soil, storm drains and waterways. Animals ranging from invertebrates to large marine mammals mistake microplastics for food and ingest them, resulting in negative health effects.

Plastic film has historically found minimal markets. When recycled with other curbside commingled recyclables, the difficult form causes issues at material recovery facilities. Films tend to get snagged and tangled in machinery, causing jams and damage to equipment designed to recover rigid plastics. This degrades processing efficiency and staff safety, while raising labor costs.

Markets for plastic film recycling are on the rise, however. It is suggested that while only 5.4 percent of plastic films are recycled, it is always a cost-effective product to recycle, considering collection, baling and transportation. While it is best to reduce plastics with reuse or substitution, recycling can keep soft plastics out of landfills and the environment. Soft plastics, or plastic film, can be used to create recycled products such as decking, fences, playground equipment, pipes, pallets, crates and new soft plastics.

DEP has been researching ways to incorporate campus-wide plastic film collection through a pilot recycling program started in March 2017.

As a reminder, DEP offers recycling and other waste management consultation for offices and labs located on campus throughout the year. To schedule a consultation for your office or Green Team, call (301) 496-7990 or email NIH recycling coordinator Tierra.Robinson@nih.gov.



Puppet depicts the Plastic Bag Monster.

PHOTO: TIERRA ROBINSON



Panelists included (from l) Dr. Nathan Price, Dr. Josh Anthony and Dr. Ben van Ommen.

PHOTOS: LISA HELFERT

Nutrition

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nutrition is driven by vast amounts of genetic, lifestyle and other health data, which now can be generated and analyzed thanks to such innovators as renowned biologist Dr. Leroy Hood. His leadership of teams who developed automated DNA sequencers and other technologies paved the way for using big data in medical research.

“The analysis of this data will lead to actionable possibilities that could either improve wellness and/or let you prevent, or at least ameliorate, disease,” said Hood, chief science officer, Providence St. Joseph Health and chief strategy officer and cofounder, Institute for Systems Biology (ISB). He spoke at a recent NIDDK Office of Nutrition Research symposium in Lipsett Amphitheater.

Advances in digital health are shifting medicine from a population-based, reactive model to one that’s individualized, proactive and focused not just on disease, but also on wellness, said Hood. He calls this approach P4 health, a system that’s predictive, preventive, personalized and participatory.

With dynamic data clouds at the heart of their research, ISB recently piloted a year-long nutrition and wellness project—the Pioneer 100 Study. It sequenced the genomes of 108 people, conducted quarterly blood and stool tests, monitored lifestyle through digital gadgets and provided wellness coaching.

Most clinical anomalies among participants were easily addressed through dietary intervention, said Hood. Participants who

were pre-diabetic saw their blood sugar drop substantially with dietary changes. Some of the pioneers with dangerously low levels of vitamin D learned they had one or more variant genes that blocked the vitamin’s absorption. These people needed to take much larger doses to compensate.

“The pioneers loved the idea they could make their own health decisions and that the genome doesn’t control your destiny, rather just your potential,” said Hood.

One pioneer had arthritis in his knees and found little relief through medication, recounted Dr. Nathan Price, professor and associate director of ISB. Lab tests showed the man had an abnormally high ferritin level (a marker of iron status); his genome sequence revealed he was genetically predisposed to hemochromatosis, a condition of iron overload that, if untreated, ultimately leads to damage to the heart, liver and pancreas and can be fatal. Cartilage damage is an early sign of this disease. After he was referred to his doctor, who diagnosed him with hemochromatosis, the man started donating blood monthly to shed the excess iron, which prevented the development of more serious organ damage.

“Because he was empowered with this knowledge, he could make a very simple decision and eliminate his disease trajectory from his future,” said Price.

Several pioneers with high mercury levels all ate tuna sushi multiple times a week, Price noted. They all brought the level under control by reducing their intake or switching to low-mercury fish. Others saw dramatic improvements in blood pressure, inflammation and cholesterol levels and, in the process, may have averted potential cardiovascular disease triggers.

“You could take someone who’s at high genetic risk,” said Price, “and turn them into someone having low actual risk by a nutritional intervention that affects the functioning of this relevant pathway.”

Personalizing nutrition relies on our body’s ability to be flexible, said Dr. Ben van Ommen, principal scientist and director, TNO (Organization for Applied Scientific Research) in the Netherlands.

If, for example, van Ommen consumed

• • •
“There needs to be an economy that thrives on making me healthy, not on keeping me ill...”

—DR. BEN VAN OMMEN

• • •

75 grams of glucose, his body would compensate for the spike in that molecule, though that single dose for a time affected his blood pressure, cholesterol and other bodily processes. If he was diabetic or obese, his system would be less flexible. He could take a pill to block the glucose, but as other systemic problems emerged, he’d need more kinds of medication.

“It’s good for pharma, not good for physiology,” van Ommen said. “It does not optimize my flexibility. That’s why personalized nutrition is so key to health.”

In Europe, citizens are banding together to create a health data cooperative in which every participant is a co-owner and controls what happens to his or her data. With

enough participants, the cooperative offers negotiating power with researchers, hospitals and the food industry.

“There needs to be an economy that thrives on making me healthy, not on keeping me ill, like these pills [would],” said van Ommen.

The human body needs all the help it can get to regulate itself and keep all systems in balance, said Dr. Josh Anthony, vice president of global R&D, nutrition and regulatory affairs at Campbell Soup Co. and founding chief science officer of Habit LLC.

“If we’re measuring components in a fasting state, often it’s not until you see biomarkers that are at such a point of dysregulation that you’re already in frank disease [and at that point, medication is needed],” said Anthony. “The opportunity here is how can we act earlier to be able to utilize nutrition as an intervention?”

That’s where technology comes in, with the goal of creating accessible personalized nutrition programs. One such program, Arivale, born from the Pioneer pilot study, is promoting wellness among thousands of patients using data analysis and coaching. Hood and Price said they’re already starting to see biomarkers that may help identify nutritional and other interventions earlier.

Habit LLC uses a mixed meal challenge beverage as part of a test to get an early read on metabolic flexibility in combination with genetics, blood biomarkers, lifestyle and health goals data. It then delivers a personalized nutrition plan online, along with personalized coaching. Consumer nutrition-based pilot studies have shown improved dietary patterns, lower cholesterol and improvements in weight loss, waist circumference and BMI, among the health gains, said Anthony.

“We’re looking for personalized approaches to drive improved health outcomes and for results to be sustainable over time,” he said.

Behavior change can be challenging and these programs rely on participants faithfully implementing the recommendations over time. Would you make the right dietary choices with this knowledge? That’s another story. For those who want to try, the technology is at your fingertips. **R**

WALS To Host Dyer, Pittman Lectures

The NIH Director’s Wednesday Afternoon Lecture Series will host the annual Rolla E. Dyer Lecture on Apr. 25 and the annual Margaret Pittman Lecture on May 2.

The Dyer lecture will be presented by Dr. Katherine A. Fitzgerald, professor of medicine at the University of Massachusetts Medical School. Her talk is titled “Sensing from Within: How the Immune System Discriminates Friend from Foe.”

Her laboratory is studying the molecular mechanisms that control the inflammatory response. She is interested in determining how the immune system discriminates among pathogens, resident microflora and host molecules to both protect the host from infection and avoid damaging inflammatory diseases. Her lab employs multifaceted approaches including immunology, biochemistry, molecular biology and genetics to understand these mechanisms.

The lab’s long-term goals are to understand how dysregulation of innate immunity underlies the pathogenesis of infectious, inflammatory and autoimmune disease in humans.

The lecture was established in 1950 in honor of former NIH director Dr. Rolla E. Dyer, a noted authority on infectious diseases, and features internationally renowned researchers who have contributed substantially to medical as well as biological knowledge of infectious diseases.



Dr. Katherine A. Fitzgerald

Raman Gives Pittman Lecture

The Pittman lecture will be presented by Dr. Indira M. Raman, Bill and Gayle Cook professor at Northwestern University. Her talk is titled “Cerebellar Synaptic Signaling as a Metaphor for Mentorship: How Silence and Speech Get Different Deeds Done.”

Raman will discuss synaptic and cellular specializations in the mouse cerebellar nuclei that permit distinct modes of firing in response to different patterns of synaptic inputs as measured *in vitro* as well as their relationship to movements measured in awake behaving animals.

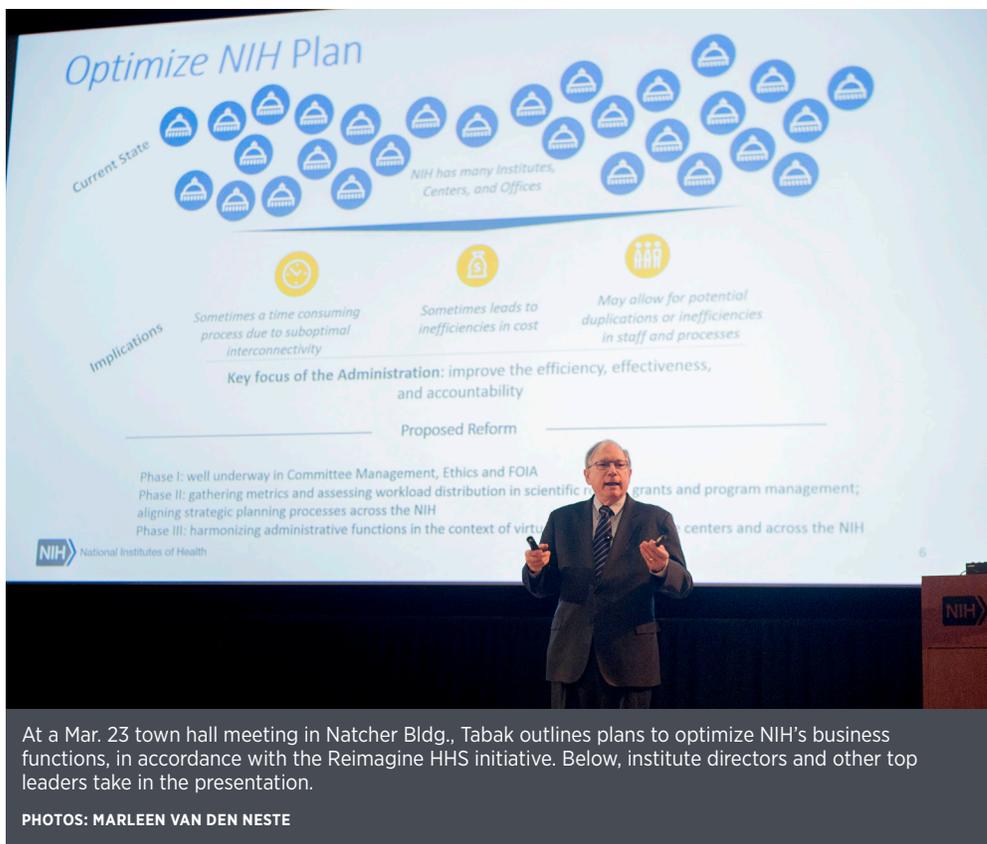
The data provide evidence that not only the rate, but also the temporal structure of neuronal cell-firing can influence the efficacy of synaptic excitation of large neurons, the pattern of cerebellar output and the consequences for motor behavior.

The Pittman lecture is given by a researcher dedicated to advancing and improving the careers of women scientists. Since 1994 when this annual lecture began, every speaker has exemplified the intelligence, scientific excellence and drive that made Margaret Pittman a leader as the first female laboratory chief at NIH.

For lecture information and reasonable accommodation, contact Jacqueline Roberts, (301) 594-6747 or robertsjm@mail.nih.gov.



Dr. Indira M. Raman



At a Mar. 23 town hall meeting in Natcher Bldg., Tabak outlines plans to optimize NIH's business functions, in accordance with the Reimagine HHS initiative. Below, institute directors and other top leaders take in the presentation.

PHOTOS: MARLEEN VAN DEN NESTE

Optimize

CONTINUED FROM PAGE 1

NIH'ers are involved in 5 of the 10 teams, but driving only one—the one called “Optimize NIH,” which falls within the shift to make HHS more innovative and responsive.

“We were entrusted with the charge of coming up with a plan to improve efficiencies here at NIH,” Tabak pointed out. Among HHS agencies, only NIH and FDA were given such leeway to chart their own destinies at the operating division level. Tabak, along with NIH deputy director for management Dr. Alfred Johnson, leads Optimize.

“This is very much an NIH-developed and NIH-driven program,” Tabak said. “We’ve taken full advantage of this opportunity.”

Focusing on how NIH conducts its business functions, Optimize identified three areas—committee management, ethics and Freedom of Information Act (FOIA)—to review first in phase 1.

More than 110 designated representatives—and volunteers—from all three groups worked together on “process mapping,” which meant examining individual functions and procedures comprehensively, step

by step to find potential redundancies and areas for possible collaboration or economies of scale.

“The current state of NIH is that we have many institutes, centers and offices,” Tabak said. “When you have seen one institute, you have seen one institute. There is virtually nothing that is the same in every institute. That’s part of our strength, but from an efficiency and an administrative viewpoint, that also is a potential weakness. The idea is to maximize the strength part of that diversity approach—by identifying the best way of doing things—and to minimize the inefficient part.”



Also already under way, phase 2 involves gathering metrics, assessing workload distribution and aligning NIH strategic plans.

In phase 3, which is set to start in 6-9 months, Optimize will harmonize administrative functions via virtual operational service centers. Informal conversations with executive officers, who are considered the domain experts for individual components, will begin immediately to get the lay of the land on how this phase can best be accomplished.

Tabak explained that, unlike the wide diversity of processes needed to address specific scientific areas, there may be functions that do not benefit from so many different approaches. “That’s what we’re going to focus on,” he said.

Optimize is expected to take 2-3 years to complete.

“We’re going to do this in a data-driven, deliberative, careful manner,” emphasized Tabak. “Rule one—no RIFs. Rule two—do no harm. The goal here is not to break anything. The goal here is to make things better, to enable you as our employees to enhance what you do so you can do a better job.”

A grid preliminarily developed by Optimize puts certain admin functions into seven virtual service centers in phase 3, so that NIH can benefit from enhanced collaboration and best practices. Tabak quickly put to rest the notion that NIH will collapse certain ICs or consolidate specific offices.

“We will not be consolidating anything,” he said. “We’re not preordaining any centralization in phase 3 other than we want the institutes and centers who are grouped together to be working more in harmony, trying to achieve any economies of scale that are possible.”

In the Q&As, Tabak addressed several topics, including how Optimize’s success will be measured, the possibility of offering buyouts and the current hiring process.

NIH’ers can watch the whole town hall online at <https://videocast.nih.gov/summary.asp?Live=27411&bhcp=1>. Also, an intranet site devoted to the effort will be updated regularly at <http://employees.nih.gov/pages/optimize-nih.aspx>. 

New Coronavirus Emerges From Bats in China

A newly identified coronavirus that killed nearly 25,000 piglets in 2016-2017 in China emerged from horseshoe bats near the origin of the severe acute respiratory syndrome coronavirus (SARS-CoV), which emerged in 2002 in the same bat species.

The new virus is named swine acute diarrhoea syndrome coronavirus (SADS-CoV). It does not appear to infect people, unlike SARS-CoV, which infected more than 8,000 people and killed 774. No SARS-CoV cases have been identified since 2004.

The study investigators identified SADS-CoV on four pig farms in China's Guangdong Province. The work was a collaboration among scientists from EcoHealth Alliance, Duke-NUS Medical School, Wuhan Institute of Virology and other organizations and was funded by NIAID. The research is published in the journal *Nature*.

The researchers say the finding is an important reminder that identifying new viruses in animals and quickly determining their potential to infect people is a key way to reduce global health threats.

SADS-CoV began killing piglets on a farm near Foshan in Guangdong Province in late October 2016. Investigators initially suspected porcine epidemic diarrhoea virus (PEDV) as the cause. PEDV is a type of coronavirus common to swine that had been identified at the Foshan farm. Detection of PEDV ceased by mid-January 2017, yet piglets continued to die, suggesting a different cause. Scientists say separating sick sows and piglets from the rest of the herd helped stop the outbreak of SADS-CoV by May 2017.

Investigators confirmed the connection of SADS-CoV to bats by identifying the new virus in the small intestine of piglets from the outbreak. They then determined that the genetic sequence of SADS-CoV is similar to that of a bat coronavirus discovered in 2007 and looked for evidence of SADS-CoV in bat specimens collected 2013-2016 in Guangdong Province. The new virus appeared in 71 of 596 specimens.

The researchers also tested 35 farm



Horseshoe bat

IMAGE: ECOHEALTH ALLIANCE

workers who had close contact with sick pigs, none of whom tested positive for SADS-CoV.

Currently 6 coronaviruses are known to cause disease in people, but so far only 2 of them—SARS-CoV and Middle East Respiratory Syndrome coronavirus—have caused large outbreaks of fatal illness in people.

Elevated Blood Pressure Before Pregnancy May Increase Chance of Pregnancy Loss

Elevated blood pressure before conception may increase the chances for pregnancy loss, according to an analysis by researchers at NIH. The authors conclude that lifestyle changes to keep blood pressure under control could potentially reduce the risk of loss. The study appears in *Hypertension*.

The analysis found that for every 10 mmHg increase in diastolic blood pressure (pressure when the heart is resting between beats), there was an 18 percent higher risk for pregnancy loss among the study population. Millimeter of mercury, or mmHg, is the unit of measure used for blood



IMAGE: ASTEROID/ISTOCK

pressure. Researchers at NICHD conducted the study.

“Elevated blood pressure is linked to heart disease, stroke and kidney disease,” said the study’s senior author, Dr. Enrique Schisterman, chief of NICHD’s Epidemiology Branch. “Our findings suggest that attaining a healthy blood pressure before pregnancy could not only have benefits later in life, but also reduce the chances for pregnancy loss.”

The researchers note that the study does not prove that elevated blood pressure causes pregnancy loss. It is possible that another, yet-to-be identified factor could account for the findings. They added, however, that the relationship between preconception blood pressure and pregnancy loss remained the same when they statistically accounted for other factors that could increase pregnancy loss, such as increasing maternal age, higher body mass index or smoking.

“Our results suggest that further research could help determine if treating elevated blood pressure and other health risks before conception improves pregnancy outcomes,” said the study’s first author Dr. Carrie Nobles, a postdoctoral fellow in the Epidemiology Branch.

Early Stimulation Boosts Performance of Bioengineered Human Heart Cells

Researchers are now able to use induced pluripotent stem cells (iPSC) to form a model of human adult-like cardiac muscle by introducing electric and mechanical stimulation at an early stage. Since this muscle is similar to the adult heart, it could serve as a better model for testing the effects of drugs and toxic substances than current tissue-engineered heart models.

The study, performed by scientists at Columbia University and funded by NIH, was published Apr. 4 in *Nature*.

Stem cells have the potential to turn into many different types of cells. Human cells lose this flexibility once they have matured, which is why, for example, heart cells don’t spontaneously decide to become lung cells. iPSCs are cells taken from an adult that have been manipulated,

or induced, into a stem-cell state. Researchers are then able to guide these “blank slate” cells into different cell types by using various chemical and physical stimuli. Scientists have been able to engineer cardiac tissue using iPSC-derived cardiomyocytes (iPS-CMs) for years. However, engineering tissue that can successfully mimic the intricacies of adult human heart cells is not easy and, until now, had not been achieved in the lab.

“Human cardiac tissue grown in the lab that displays the behavior of native heart muscle would be transformative for biomedical research,” said Dr. Gordana Vunjak-Novaković, biomedical engineering professor at Columbia. “To reach this goal, we forced the cultured heart muscle to go through the fetal-to-postnatal transition by an accelerated development. This was done by using early-stage iPSC-CMs and increasing the frequency of electrically induced contractions, little by little, every day. The tissues responded, and displayed adult-like gene expression, remarkably organized ultrastructure and a number of functional features seen in the mature heart muscle, after only 4 weeks of culture.”

Vunjak-Novaković and her team have made significant strides in reliably engineering human heart muscle that mimics adult myocardium. They found that the longer they waited to introduce physical stimuli such as electric current and mechanical stimulation to the iPSCs, the less responsive the cells were. The team reasoned that the earlier they introduced electromechanical stimuli, the greater the effect would be.

“The resulting engineered tissue is truly unprecedented in its similarity to functioning human tissue,” said Dr. Seila Selimovic, director of NIBIB’s tissue chips program. “The ability to develop mature cardiac tissue in such a short time is an important step in moving us closer to having reliable human tissue models for drug testing.”

The better the engineered tissues emulate the human heart, the better they can predict the effects that drugs or environmental factors have on the actual heart tissue of a patient. Having a reliable human tissue model would help make drug development significantly faster, safer and cheaper.

Have a question about some aspect of working at NIH? You can post anonymous queries at <https://nihrecord.nih.gov/> (click on the Feedback tab) and we'll try to provide answers.

Feedback: Why do they keep replanting the trees in between the road and the sidewalk on the northwest side of Bldg. 10? They die every year from the sidewalk salt runoff.

Response from the Office of Research

Facilities: Thank you for your interest and concern for the health of our campus tree canopy. ORF takes a lot of pride in maintaining our tree-lined roadways and pathways for everyone's enjoyment. Our 1:1 NIH tree replacement policy stipulates that for every tree that perishes or is otherwise removed, it is replaced with a new nursery-grown tree.

Along with each newly planted tree, NIH receives a 1-year warranty from the contractor on the health of the tree. If the tree does not survive a full year (including one winter season) it is replaced by warranty at no cost to NIH.

Much of the tree-planting activities in "difficult to establish" spots on campus are actually warranty replacements and not new tree purchases. No new tree plantings have occurred in the area northwest of Bldg. 10 since 2015, so it is likely that any more recent tree-planting activity witnessed in this area was due to warranty replacements.

There are many reasons why trees die, and when they do there are often a number of contributing factors. It is true that winter snow-melt salts can adversely affect the health of some species of trees that are sensitive to either elevated soil salinity and/or salt spray from passing vehicles. ORF continues to evaluate performance of tree species on campus subject to a variety of environmental conditions to guide future tree-planting strategies.

The ORF landscape architect tracks the warranties of all new trees and makes adjustments to species that do not thrive, with an emphasis on selecting mid-Atlantic

native tree species for new plantings. Last year, the failing London Plane trees on the north side of North Dr. were replaced with thornless honeylocusts (*Gleditsia triacanthos* var. *inermis* 'Skyline'). This coming year, seedless American sweetgum trees (*Liquidambar styraciflua* 'Rotundiloba') will be planted along the south edge of Wilson Dr. where scarlet oaks were unsuccessful in establishing.



American sweetgum tree, in autumn

IMAGE: FAMARTIN/WIKIMEDIA

Aiyelawo Named CC Chief Operating Officer

U.S. Navy Capt. Pius Aiyelawo (ret.) became chief operating officer of the Clinical Center on Apr. 2. He fills a COO role newly expanded to include management of most clinical as well as administrative areas. He reports directly to hospital chief executive officer Dr. James K. Gilman.

"Pius's tremendous health care leadership experience is matched only by a positive energy and spirit that will inspire both patients and staff," said Gilman. "After a very competitive national search, I am convinced he is the right person to help us raise the bar ever higher in delivering safe, high quality patient-centric care."

Aiyelawo held senior leadership positions in hospitals and large medical research programs throughout a distinguished military career spanning more than 27 years. His most recent appointments included assistant deputy director, research and development, U.S. Navy Bureau of Medicine and Surgery, Falls Church, Va., and COO/deputy commander of Naval Medical Research & Development Command, Fort Detrick, Md. He also has served as commanding officer of the largest Navy health care facility, U.S. Naval Hospital, Okinawa, Japan, where he led successful planning, transition and relocation to a new \$650 million hospital complex.

Aiyelawo's awards include the Legion of Merit with two gold stars, Defense Meritorious Service Medal, Navy Meritorious Service Medal with two gold stars, Navy Commendation Medal with one gold star, Navy Achievement Medal, service and unit awards.

Following retirement from the Navy in 2013, Aiyelawo served as senior



U.S. Navy Capt. Pius Aiyelawo (ret.)

program director at General Dynamics Health Solutions in Silver Spring.

He has taught health care courses throughout the world. Since 2014, he has served as an adjunct assistant professor of preventive medicine and biometrics at the Uniformed Services University of the Health Sciences.

Aiyelawo holds a bachelor of arts in management science from Alaska Pacific University, Anchorage, and received a masters of public administration from the

University of Alaska, Anchorage. He is a fellow in the American College of Healthcare Executives, on the board of directors of HelpAge USA and a member of the Society for International Development.

"I am grateful to the NIH senior leadership and Dr. Gilman for this opportunity and truly humbled to be selected as the chief operating officer of the finest and premier research hospital in the world," Aiyelawo said.

NIBIB's Leapman Named MSA Distinguished Scientist

The Microscopy Society of America (MSA) has named NIBIB scientific director Dr.

Richard Leapman a 2018 Distinguished Scientist.

The society's Distinguished Scientist Awards annually honor pre-eminent senior scientists, one each in the biological and physical sciences, for a long-standing record of achievement in the field of microscopy and microanalysis. Leapman is recognized in the biological sciences category.

Christine Brantner, biological sciences co-chair of the MSA awards committee, said, "Richard Leapman's continuous



Dr. Richard Leapman

interest in developing and refining methods in electron spectroscopy and element-specific imaging has led to many publications elucidating details of biological systems including the calcium content of acidocalcisomes in trypanosomes and the quantitation of the sulfur contact of L-granules in keratinocytes. Richard's work in scanning transmission electron microscopy has led to mass determinations in unstained specimens. Of note is his work with amyloid fibrils that accumulate in the brains of Alzheimer's patients."

Leapman will be honored at the society's annual convention, Microscopy & Materials, on Aug. 6 in Baltimore.

NINDS's Goldstein Wins AAN Award

BY SHANNON E. GARNETT

Dr. David S. Goldstein, chief of NINDS's clinical neurocardiology section, will soon receive the Irwin Schatz Award for Autonomic Disorders from the American Academy of Neurology (AAN).

The award is named for Dr. Irwin Schatz, a founding member of the American Autonomic Society. It recognizes young investigators who have advanced the field of autonomic disorders and senior investigators who have made major contributions to the field. Goldstein will receive the award at the annual AAN meeting on Apr. 23 in Los Angeles.

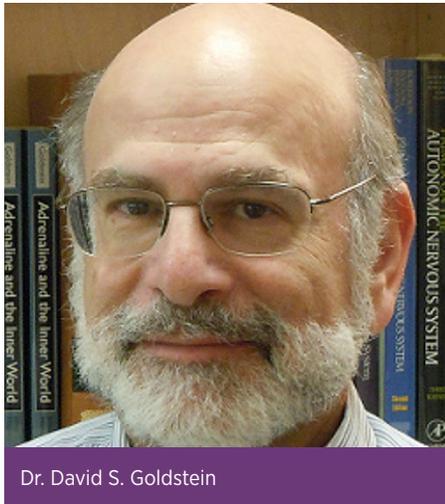
Goldstein is being honored for his significant contributions to research on autonomic and catecholamine-related disorders.

During his nearly 40-year career in the NIH intramural research community, Goldstein has introduced many new technologies and made numerous discoveries that have advanced these fields. He has helped pioneer and continues to be a leader in clinical catecholamine neurochemistry and sympathetic neuroimaging.

"I feel thankful for the extraordinarily devoted people who have worked with me in NIH's intramural program, for my family who have tolerated my spending so much time on NIH 'stuff' and for the patients who have entrusted themselves to me and provided me so many precious sparkles of insight," said Goldstein.

He earned his undergraduate degree from Yale College and his M.D.-Ph.D. in behavioral science from Johns Hopkins. He furthered his medical training in internal medicine at the University of Washington.

Goldstein came to NIH in 1978 as a clinical associate at NHLBI and obtained tenure in 1984. He joined NINDS in 1990 as head of the clinical neurochemistry section



Dr. David S. Goldstein

in the Clinical Neuroscience Branch and then founded the independent clinical neurocardiology section, which he continues to direct. The section conducts patient-oriented research and operates a renowned clinical neurochemistry laboratory for assays of levels of catecholamines and their metabolites.

Goldstein has authored more than 575 research articles and several books, including *Adrenaline and the Inner World: An Introduction to Scientific Integrative Medicine*; *Dysautonomias: A Handbook for Patients*; *Stress, Catecholamines, and Cardiovascular Disease*; *The Autonomic Nervous System in Health and Disease*; and the e-book *Principles of Autonomic Medicine*. He directs the United Council for Neurologic Subspecialties-accredited clinical fellowship in autonomic disorders at the Clinical Center.

Goldstein's current research focuses on biomarkers, mechanisms and potential treatments of catecholaminergic neurodegeneration in Parkinson's disease and related disorders. **R**

Healthy Volunteers Needed

NIAID researchers seek healthy volunteers, 18-50 years old, for an investigational vaccine study targeting respiratory syncytial virus (RSV). Compensation is provided. For more information, call 1-866-833-5433 (TTY 1-866-411-1010). Email vaccines@nih.gov or visit <http://bit.ly/2nOkOvY>.

Volunteers with Leukemia Needed

NHLBI researchers need volunteers with CLL (chronic lymphocytic leukemia) or small lymphocytic lymphoma (SLL) for a new investigational treatment study. Researchers are adding pembrolizumab (an immunotherapy agent) to standard treatment. If you have received treatment for CLL and progressed or have high-risk genetic changes such as deletion 17p, TP53 mutation, NOTCH1 mutation or complex cytogenetics, you may be interested in participating. To learn more, call the Office of Patient Recruitment at 1-866-444-2214 (TTY 1-866-411-1010). Read more online at <https://go.usa.gov/xnYae>. Refer to study 17-H-0118.

NIDDK Study Seeks Overweight Men

NIDDK researchers are seeking overweight/obese men, 18-50 years old, to participate in a study looking at a potential link between consumption of processed foods and the development of metabolic syndrome. Participants will be required to remain in the hospital for 1 month on 2 separate occasions and eat only the meals provided by NIH during that time. Compensation is provided. To learn more, call the Office of Patient Recruitment at 1-866-444-2214 (TTY 1-866-411-1010). Read more at <https://go.usa.gov/xRRE7>.

Healthy Volunteers Needed for Malaria Vaccine Study

NIAID researchers seek healthy volunteers, ages 18-50, for a study testing an investigational malaria vaccine at the Clinical Center. Compensation is provided. To learn how to participate, call the Office of Patient Recruitment, 1-866-444-2214 (TTY 1-866-411-1010). Read more at <https://go.usa.gov/xX5t4>. Refer to study 17-I-0067.

NHLBI Study Needs Patients

NHLBI researchers are testing two low doses of danazol on individuals with short telomere disease and bone marrow disease, lung or liver disease. For more information, call the Office of Patient Recruitment, 1-866-444-2214 (TTY 1-866-411-1010). Read more at <https://go.usa.gov/xnPYm>. Refer to study 18-H-0004.



NIEHS grantee Dr. Karletta Chief, a member of the Navajo Nation, is a hydrologist at the University of Arizona, where she works with three NIEHS-funded centers.

PHOTO: SCIENCE FRIDAY

'Science Friday' Film Highlights NIEHS Grantee

NIEHS grantee Dr. Karletta Chief caught the attention of the folks behind *Breakthrough: Portraits of Women in Science*, a collection of short films sponsored by *Science Friday* and the Howard Hughes Medical Institute. The film on Chief, *Breakthrough: Bitter Water*, is the sixth and final film in the series. It tells the story of her family roots and the goals of her scientific research.

Chief, who is a member of the Navajo Nation, is a hydrologist at the University of Arizona, where she works with three NIEHS-funded centers. She directs the Community Engagement Core of the Superfund Research Program, is an advisory board member of the Center for Indigenous Environmental Health Research and is a pilot researcher with Southwest Environmental Health Sciences Center.

In 2015, the Gold King Mine Spill released mining waste into the Animus River in Colorado. Chief is studying three Navajo Nation communities downstream, which were affected by the spill—Shiprock and Upper Fruitland in New Mexico and Aneth in Utah. The project is looking at the short-term exposure and risk perceptions in the affected communities.

An important aspect involves reporting research findings at community teach-ins, where Chief typically makes presentations in the Navajo language.

In the latest update, they reported early findings on lead, arsenic and manganese levels in water, sediment, house dust and agricultural and residential soil, as well as in blood and urine samples collected by Navajo community health workers.

To date, most of the analyses show low or no levels of concern. However, spikes occur in the river during high-flow snow runoff events.

"Karletta's research has a vital connection to the communities she is involved in," said NIEHS health scientist administrator Dr. Symma Finn. "Her work serves the people who live there, at the same time as it advances the science. For example, with intimate knowledge of lifestyles and environmental conditions, she was able to identify exposure pathways that others missed."

The video is available at <https://www.youtube.com/watch?v=8fd8e6ycYGI>.—**Kelly Lenox** 

Taylor Gives NINR Director's Lecture

Dr. Jacquelyn Taylor will present the second 2018 NINR Director's Lecture on Tuesday, May 22, from 1 to 2 p.m. in Lipsett Amphitheater, Bldg. 10. Her presentation is titled "Hypertension Genomics in Black Families: A Tale of 3 Studies, and Counting..." The lecture will be followed by an opportunity for questions and discussion.

Taylor is the inaugural Vernice D. Ferguson endowed professor in health equity at the Rory Meyers College of Nursing at New York University.



Dr. Jacquelyn Taylor

Taylor's work focuses on the genomics of chronic disease among African-American populations. Her current research examines the effect of psychological, genetic and epigenetic factors on blood pressure in black/African-American women and their young children. She is also conducting a study on the genomics of lead poisoning in Flint, Mich.

Taylor formerly served as tenured faculty and associate dean of diversity and inclusion at Yale University School of Nursing. She was awarded the Presidential Early Career Award for Scientists and Engineers, the highest honor bestowed by the U.S. government to outstanding scientists and engineers in early stages of their independent research careers. Her long-term goal is to develop nursing interventions to prevent and reduce omic-environment risks associated with health disparities.

The NINR Director's Lecture series is designed to bring the nation's top nurse scientists to campus to share their work and interests with a transdisciplinary audience. The event is free and open to the public. For more information and to register, visit www.ninr.nih.gov/directorslecture.

Dishman To Give Leiter Lecture

May 9

Eric Dishman, director of the All of Us Research Program at NIH, will deliver the 2018 Joseph Leiter National Library of Medicine/Medical Library Association Lecture, Wednesday, May 9. It will take place at 1:30 p.m. in Lister Hill Auditorium, Bldg. 38A.

His topic will be, "Precision Communications for Precision Health: Challenges and Strategies for Reaching All of Us." Among other subjects, he will discuss the challenges and strategies around:



Eric Dishman

- Meeting communities where they are (understanding their needs, concerns around research, meeting their literacy levels, etc.);

- Widening the definition of precision health and conveying the fact that All of Us is more than a genomics program;

- Ethics and logistics of targeting with marketing analytics; and

- Balancing the promise, with the hype and vision, with the need for patience.

The lecture, open to the public, will also be recorded and broadcast live and later archived at <https://videocast.nih.gov/Summary.asp?Live=27103&bhpcp=1>.