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Bertagnolli Visits Oklahoma to Discuss Research Collaborations

NIH Director Dr. Monica Bertagnolli visited the University of Oklahoma (OU) on Aug. 21 for a series of meetings with OU leadership. She came to learn how OU researchers are utilizing NIH funding to better understand human disease and discover new methods for diagnostics and treatment.

NIH Director Dr. Monica Bertagnolli discusses research efforts during a recent meeting at the University of Oklahoma. **PHOTO: OU**

During the visit, Bertagnolli—accompanied by National Institute on Drug Abuse Director Dr. Nora Volkow, Dr. Karina Walters, director of NIH's Tribal Health Research Office, and Dr. Susan Gregurick, associate director of NIH's Office of Data Science—toured OU's Stephenson Cancer Center and discussed ways data science can revolutionize health research. Bertagnolli and the NIH team also visited the Absentee Shawnee Tribe Health Center in Norman. There, they met with experts who are leading research to address overdose, substance use and pain, supported by NIH's Native Collective Research Effort to Enhance Wellness (N CREW) program.

SEE **N CREW**, PAGE 6

How to LAUNCH a Global Health Research Career

Yolanda Thomas (c) of FIC with Dr. Evelyn Hsieh (l) and Dr. Albert Ko of Yale University

Each year the faces change, though the contagious enthusiasm remains the same. In July, the Fogarty International Center (FIC) brought trainees from across the globe to NIH's Bethesda campus for its annual, week-long orientation program.

Each early-career researcher, selected for Fogarty's Launching Future Leaders in Global Health (LAUNCH) Research Training Program, will embark on a one-year

SEE **LAUNCH**, PAGE 6

NIBIB welcomes congressional staff. See p. 5.

ALSO THIS ISSUE

OUT LIKE A LIGHT

Professor Expounds on the How and Why of Sleep

BY DANA TALESNIK

Dr. Yang Dan

Some people routinely get quality sleep; others wish they got more of it. Rest assured, though, everyone gets some sleep; it's essential for survival.

Every living organism with a nervous system sleeps. Even jellyfish, with their primitive nervous system, catch their Zzzs.

Earlier sleep studies pointed to a single

SEE **SLEEP**, PAGE 8

Former NBA Player Turned Psychologist Offers Team-Building Advice

BY KRISTINE DURU

John Amaechi

Professor John Amaechi is no stranger to working on a team. He is an organizational psychologist, the founder of APS Intelligence, a *New York Times* best-selling author, an officer of the Order of the British Empire and a retired NBA player.

During a recent lecture in the Deputy Director for Management series, Amaechi gave NIH'ers tips on establishing good leadership and cohesive teams.

SEE **AMAECHI**, PAGE 4

Autumn Brings NIH Research Festival and WALS 30th Anniversary Season

Mark your calendars. The NIH Office of Intramural Research (OIR) invites the entire NIH community to come together for a pair of familiar events: the NIH Research Festival, a homecoming of sorts, and the return of the NIH Director's Wednesday Afternoon Lecture Series (WALS).

Dr. Manu Prakash, creator of the Foldscope, is the WALS speaker on Sept. 25.

The 2024 NIH Research Festival is Sept. 23–25 in and around Building 10 on the NIH Bethesda campus. Look forward to a lively three days of poster sessions, lectures, workshops, and information tables highlighting research within and services for the NIH Intramural Research Program.

Consider attending the in-person poster sessions throughout the day on Monday and the virtual poster session on Tuesday. The scientific input generated from attendees during these sessions has been invaluable to intramural researchers in years past.

Plan your festival week and see the full schedule of events posted at https://researchfestival.nih.gov. All lectures will be viewable via NIH videocast.

The WALS, the highest profile lecture series at the NIH, is now in its 30th year. Another stellar lineup is in store for the 2024–2025 season. Refer to https://oir.nih.gov/wals for the full schedule.

The first WALS lecture on Sept. 11 featuring Dr. Eve Marder, in case you missed it, is archived at https://videocast.nih.gov/watch=55003. The next lecture, on September 18, will be on biospecific chemistry by Dr. Lei Wang.

Also, be on the lookout for the annual call for WALS speakers in November. The OIR welcomes nominations from the entire NIH community.

For weekly reminders about WALS speakers, please consider joining the WALS listserv at https://go.nih.gov/sgVrndf. Contact walsoffice@od.nih.gov if you have any questions about the Research Festival or the WALS. **—Michael Tabasko**

NCI's CRDC Hosts Symposium Oct. 16-17

The National Cancer Institute's (NCI) Cancer Research Data Commons (CRDC) will mark its tenth anniversary with a fall symposium titled, *Ten Years of Empowering Cancer Researchers*.

The event will be held in person in the Bethesda/Rockville area and online on Oct. 16 and 17 from 9:00 a.m. to 4:00 p.m. ET.

The CRDC is a cloud-based science infrastructure that provides secure access to a large, comprehensive and expanding collection of cancer research data and data science tools.

The goal of the symposium is to update the NCI and NIH community on the components, successes and future plans for the CRDC. Topics include updates on initiatives including artificial intelligence data readiness and the CRDC's collaboration with the Advanced Research Projects Agency for Health to develop a biomedical data fabric toolbox.

This meeting will be held in conjunction with NCI's Office of Data Sharing (ODS) annual meeting, Oct. 15 – 16. To view the agenda or to register, visit: https://events.cancer.gov/crdc/events. Email questions or comments to NCICRDC@mail.nih.gov.

NIH Police Show Their Support to NIH Patients, Families

The NIH Police recently presented a donation to the Friends of Patients at the NIH.

The organization provides emergency social, financial and logistical support to patients while they are undergoing treatment at the NIH Clinical Center.

The officers presented the donation to Friends' CEO Heidi Williams.

From l, Sgt. Matt Mehlhaff, NIH Police Chief Cleveland Spruill Sr., Friends of the Patients at the NIH CEO Heidi Williams and NIH Deputy Police Chief Leslie Williams **PHOTO: THE CLINICAL CENTER OCMR**

NIA Hosts Healthy Aging Month Events

In September, the National Institute on Aging (NIA) will host events to highlight recent scientific innovations, global insights on longevity and steps everyone can take to stay independent as they age.

On Wed., Sept. 16, NIA Director Dr. Richard Hodes and the U.S. Agency for International Development's Assistant Administrator for Global Health Dr. Atul Gawande will co-host a fireside chat on international perspectives on health, aging and longevity.

USAID's Dr. Atul Gawande

The global population is aging, yet life expectancy varies greatly by country. Some have experienced increases in life expectancy, while others, such as the United States, have seen a decline. This event will explore how international perspectives on health and longevity are helping us understand the drivers of healthy aging around the world. The conversation will be moderated by NIH Fogarty International Center Director Dr. Kathleen Neuzil.

On Sept. 23 at 3:30 p.m. ET, experts from NIH and the Administration for Community Living (ACL) will host a Q&A about falls prevention and bone health in older adults. This 30-minute virtual event will be streamed on NIA's YouTube channel: https://www.youtube.com/@NIHAging.

For more information and related resources, see: https://go.nih.gov/yrS46IU.

ODP Sponsors New Open-Access Supplemental Journal

The NIH Office of Disease Prevention (ODP) has published its first-ever supplemental journal issue, "Design and Analytic Methods to Evaluate Multilevel Interventions to Reduce Health Disparities," released by *Prevention Science.* The open-access issue provides a collection of peer-reviewed papers on rigorous clinical trial methods that can be used to evaluate community-based interventions in populations that experience health disparities.

The 12 papers featured in the issue offer a mix of new approaches to the design and analysis of multilevel interventions. The issue also includes strategies for developing interventions that balance methodological rigor with design feasibility, acceptability and ethical considerations.

Investigators can use ODP's quick guide to navigate the issue and identify which articles address the research methods relevant to their work, such as power calculations and sample size, the use of simulations to inform study design, mixed methods approaches, health equity metrics or outcomes, and intervention development.

ODP also developed complementary materials. See: https://go.nih.gov/wVKBzfO.

Learning from Every Young Person with Cancer

BY SAMANTHA GONZALEZ

Childhood cancers are collectively rare, making up about 1-3% of annual cancer diagnoses in the country. Research progress has been slowed, in part because information on diagnosis, treatment and outcomes is often stored where a child, adolescent or young adult (AYA) is treated, making it difficult for researchers and clinicians to find and learn from this data.

Abby, (l) who had a rare form of ALL, passed when she was 15. At right, Thalia, who was diagnosed with neuroblastoma as a baby, is a cancer survivor.

The National Cancer Institute's (NCI's) Childhood Cancer Data Initiative (CCDI) aims to change that by meeting the need to connect and share this criticaldata more broadly. CCDI's work could make it easier for researchers to find patterns and accelerate discoveries to improve treatment, quality of life and survivorship of all children and AYAs with cancer.

Why Data-Sharing is Important

Like many middle schoolers, Thalia loves being with friends and pursuing her hobbies, but it's taken a lot to get here. Thalia was diagnosed with neuroblastoma at 15 months old and endured immunotherapy, chemotherapy, radiation and multiple surgeries—relapsing twice—before no longer having evidence of disease.

Now, Thalia's family hopes her experiences will help others with childhood cancer.

"If there is anything that comes from Thalia's story, any data from her treatment and care, anything to make the process easier or more effective for future patients, that would be the ideal outcome," said her parents, Kate and Jeff.

Another patient, Abby, was diagnosed with a rare form of acute lymphocytic leukemia at age 4. Shared data revealed the most promising treatments for Abby, helping to extend her life beyond her initial prognosis.

Despite harsh treatments and complications, Abby loved life and nurtured a passion for cooking, which she shared through a cooking show that raised awareness for pediatric cancer research. Abby passed away when she was 15, but her legacy lives on in her story, work and medical data.

"Data sharing accelerates learning," said Patty, Abby's mom. "Victories are replicated; failures are not repeated. It helps more people, decreases suffering and saves lives."

Uniting the Community

In collaboration with families like Thalia's, Abby's and others across the childhood cancer community, NCI's CCDI is building a data infrastructure with tools and platforms for finding, accessing and analyzing childhood cancer data from NCI and other institutions.

"The power of childhood cancer data speaks for itself," said CCDI Scientific Director Dr. Gregory Reaman. "Being able to aggregate, share and broadly use these data outside of individual projects has enormous opportunities."

CCDI is helping children and AYAs in other ways, too. The CCDI Molecular Characterization Initiative is expanding access to state-of-the-art molecular testing by providing it at no cost to children and AYAs with certain types of cancer. Results from these tests can help inform the best treatment options. Another CCDI program, the Coordinated Pediatric and Young Adult Rare Cancer Initiative, aims to advance understanding and treatment of very rare childhood cancers.

Ultimately, behind all CCDI's data and programs are young people. Their stories and voices drive this work and remind us why sharing data to power collective discovery is so important.

For more information about CCDI, visit cancer.gov/CCDI.

ON THE COVER: *NHGRI researchers have identified a specific genomic signature of some aggressive prostate tumors. The finding focuses on BRCA2 mutations, which are associated with breast and ovarian cancer, but also increase men's risk for prostate cancer. Both men and women can inherit a faulty BRCA2 gene. When working properly, the BRCA2 gene helps stop cells from becoming cancerous by producing proteins that fix damage to DNA.*

IMAGE: ERNESTO DEL AGUILA III/NHGRI

The NIH Record

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National Institutes of Health
Turning Discovery Into Health

Amaechi

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He began by displaying four kittens on screen, then asked, "Which kitten is cutest to you?"

Among the four, two cats named Yawn-ey and Ear-ey won convincingly. The results came as no surprise to him.

Amaechi's firm has collected 28,000 responses on this question from countries worldwide. Even after accounting for potential left-to-right bias or confounding variables, Amaechi said the result is the same every time— Ear-ey and Yawn-ey first and Pose-ey last. According to the psychologist, this phenomenon can be attributed to humans' natural attraction to symmetry, and evidence that the brain ties symmetry to beauty and fitness.

"It's fascinating to think that, as leaders, we're in a position where our subconscious or non-committed thoughts can have such a radical impact over what we think is cute or clever, or who we think is worthy," said Amaechi. "We discriminate in this way as leaders and it's just worth remembering."

Amaechi also highlighted what he considers the warped view that society has on what a leader looks like.

"There's a sense that great leaders are just slightly menacing and frightening, enigmatic, aloof, impenetrable, powerful and omniscient," he said. These traits, he noted, are not conducive to a successful team.

Amaechi and his firm asked senior C-suite leaders in health and social care what characteristics made a good leader when they started working in the sector. The top answers were charisma, confidence, experience and male. He dismissed charisma as a term used only for men, defining it as a term used "when we don't know how a man is so successful while simultaneously being so abrasive."

Amaechi also disputed the importance of confidence in a leader or teammate. "Everybody in this room knows somebody who would be so much better for your team if they were a little less confident," he said.

But the tides appear to be changing in people's understanding of leadership. When the same group of senior leaders was asked what leadership traits are important in the present day, their answers were much different. Empathy was the most common response. Other popular responses included vision, communication and honesty.

So, what traits make a good leader? The NIH's website is a good place to find that answer, said Amaechi. He admitted to scouring NIH's site in preparing for this seminar and agreed with what he found on NIH's Office of Human Resources mentoring hub: that a leader should be devoted to promoting continual learning, creating positive change by sharing their expertise and knowledge with others, and always seeking out new perspectives. And the list goes on.

Amaechi also encouraged leaders to be open and vulnerable with their team, because "if you know everything, why would anybody around you ever think they have to contribute? If you're invulnerable, why would anybody ever think they must support you?"

Team members, like leaders, should be willing and able to get to know one another. But they should also know themselves and maintain self-awareness.

"There's a gap between one's personal knowledge of themselves and what others see," Amaechi said. "So, a person's own perceived directness and honesty—a good set of qualities—can come across as cruel, callous and thoughtless. Those people disassemble teams."

And though Amaechi clarified that offering feedback "is not a license to eviscerate your colleagues," he also said team members should offer colleagues and leaders feedback on blind spots that could make the team less effective.

Agency, transparency, communication, trust and psychological safety are his five pillars of team success.

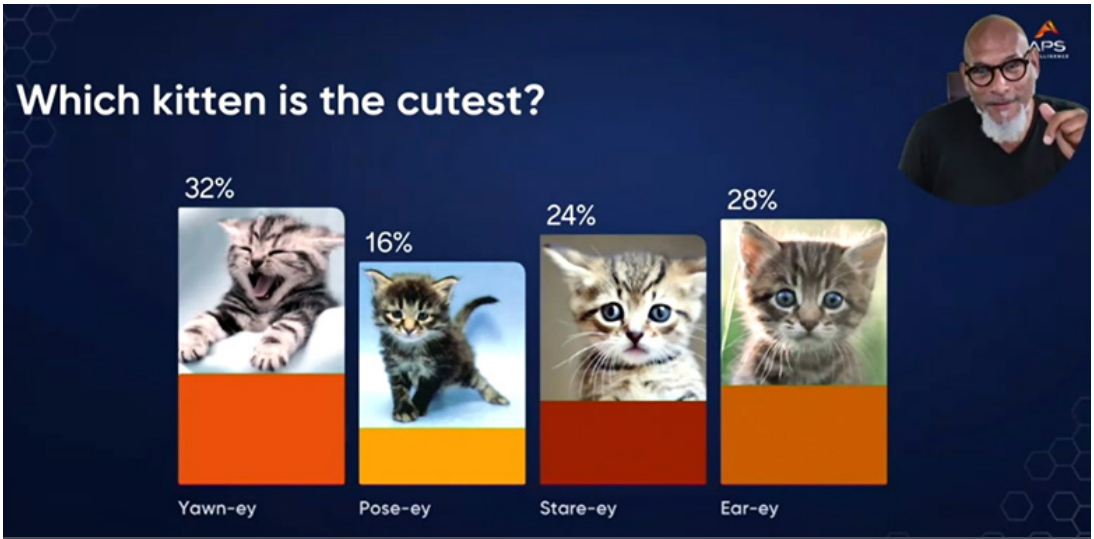
To build trust and psychological safety among team members, Amaechi offered a simple piece of advice: talk to them when you don't need anything from them. Even just a few minutes chatting in the hallway, truly being in the moment and connecting with colleagues can go a long way in forming that trust.

He concluded with a story of a fan encounter he had with a young boy during his time with the Cleveland Cavaliers. He shook the boy's hand and gave him an autograph, but the short interaction proved to have a lasting impact.

Amaechi received a note from the boy over a decade later. The fan wrote that he had followed Amaechi's career— "not the old one, the one that mattered." That young boy grew up to be a psychologist in Cleveland today.

Amaechi concluded with this message: "You are more influential than you know. Everyone is a giant to someone."

NIH'ers can watch the full seminar at https://videocast.nih.gov/watch=54384.



"It's fascinating to think that, as leaders, we're in a position where our subconscious or non-committed thoughts can have such a radical impact over what we think is cute or clever, or who we think is worthy," says Amaechi.

NIBIB Welcomes Congressional Staff to Showcase Innovative Medical Technology

BY CHRISTINE LEHMANN

Fifty congressional staff visited NIH to learn about cutting-edge technologies supported by the National Institute of Biomedical Imaging and Bioengineering (NIBIB) that could become transformative medical applications in the future.

NIBIB Director Dr. Bruce Tromberg kicked off the event by highlighting the focus areas of NIBIB's science and technology research. He also described the unique partnerships needed to develop technologies to improve health.

Dr. Junjie Yao (l) of Duke University explains how focused ultrasound can solidify a bioink in a specific part of the body to create 3D objects, which can be used to repair heart defects and other tissues.

Congressional staff then participated in five hands-on demonstrations given by NIBIB-funded grantees and intramural researchers.

A collaborative team from Duke University, Harvard Medical School and Brigham and Women's Hospital presented a new ultrasound method that could make surgery less invasive and safer. The technique combines a novel bioink with focused ultrasound to print 3D structures through solid tissues. Dr. Junjie Yao, who led the research team, described how this technique could be used to repair heart tissue without having to make an incision.

Another demonstration by the co-founders of Xander Medical (Alexandra Bisaccia and her business partner and brother Jackson Bisaccia) focused on their innovative titanium interlock screw that could be used to improve orthopedic surgery. Their novel design prevents stripping or breaking of surgical screws, a common problem in bone repair, which requires additional surgeries.

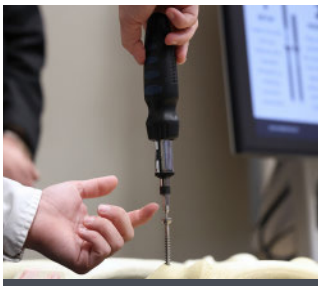
Another demonstration was given by senior investigator Dr. Manu Platt who established and directs NIBIB's Section on Mechanics and Tissue Remodeling Integrating Computational and Experimental Systems (MATRICES) laboratory.

Platt said his lab focuses on understanding how healthy tissues transition to diseased states and how to stop that progression. The research has focused on using protein enzymes as functional biomarkers to develop new diagnostics and therapeutics for sickle cell disease, cancer metastasis and other conditions.

He described a low-cost screening method that can be used for early detection of diseases such as sickle cell that are prevalent in low-income countries.

Congressional staffers also visited the laboratory of Dr. Kaitlyn Sadtler, investigator in NIBIB's Section on Immunoengineering, which she called the intersection of immunology and regenerative medicine. Her lab evaluates how our bodies respond to traumatic injuries and how biomaterials can be used to engineer better therapeutics for tissue regeneration.

The final laboratory tour and demonstration was held in Dr. Alexander Cartagena-Rivera's lab. He is an investigator in NIBIB's section on mechanobiology, where he develops atomic force microscopy (AFM) technologies. Cartagena-Rivera explained his lab is using AFM imaging to better understand two conditions: hearing loss and cancer. The scans enable researchers to study the structures and the biomechanical properties of tissues from people with these conditions. He said combining their tissue profiling strategy with machine learning analyses could help clinicians make diagnoses with greater precision.



A novel interlock screw can be inserted and removed into phantom bone.

The event came at the invitation of the American Institute for Medical and Biological Engineering (AIMBE), an advocacy group that brings together academia, industry, government and scientific societies to advance innovative, high-impact biomedical technologies. The showcase provided an opportunity for congressional staff to better understand how NIH research today is translated into the medical interventions of the future to solve complex health care problems.

Dr. Kaitlyn Sadtler (r) explains how her lab is developing biomaterials to help the body build new tissue after a traumatic injury.

Fifty congressional staff traveled from Capitol Hill to NIH to learn about innovative technologies being developed in NIBIB labs and by NIBIB-funded researchers. NIBIB Director Dr. Bruce Tromberg (last row, third from l) poses with the group.

PHOTOS: CHIA-CHI CHARLIE CHANG

N CREW

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NIH's Helping to End Addiction Long-Term® (HEAL) Initiative seeks to enhance wellness among Native Americans by advancing research on overdose, substance use, pain and mental health. In August, NIH launched N CREW in direct response to priorities identified by Tribes and Native American communities.

Despite the inherent strengths in Tribal communities, Native American communities face unique health disparities related to the opioid crisis. In recent years, for instance, overdose death rates have been highest among American Indian and Alaska Native people. To create sustainable solutions, research shaped by Native communities is essential for enhancing effective, culturally grounded public health interventions.

In a recent statement, Volkow said, "As we look for ways to best respond to the overdose crisis across the country, it is crucial to recognize that Native American communities have the best perspective for developing prevention and therapeutic interventions consistent with their traditions and needs. This program will facilitate research that is led by Native American communities, for Native American communities."

Bertagnolli (front, fifth from r) and NIDA Director Dr. Nora Volkow to her left; Dr. Karina Walters, director, NIH's Tribal Health Research Office (second from l) and Dr. Susan Gregurick, director, NIH Office of Data Science Strategy (r) visit with Absentee Shawnee Tribe (AST) Governor John Raymond Johnson (front, second from l), AST's executive committee, leadership and health board and N CREW research team, while in Okl. **PHOTO: BRENT SHIELDS/LITTLE AXE HEALTH CENTER**

The first phase of the program will support projects to plan, develop and pilot community-driven research and data improvement projects to address substance use and pain. In this phase, NIH will also support the development of a Native Research Resource Network to provide comprehensive training, resources and real-time support to N CREW participants. Areas to be addressed include governance, community safety, community services, socioeconomics, treatment and health service delivery.

The N CREW Program is led by NIDA, the National Institute of Neurological Disorders and Stroke (NINDS) and the National Center for Advancing Translational Sciences (NCATS).

LAUNCH

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mentored research project at a research institution or project site in a low- and middle-income country (LMIC). Trainees include predoctoral fellows and scholars from the U.S. as well as postdoctoral fellows and scholars from both LMICs and the U.S.

The orientation featured lectures, workshops, classes and informal talks, providing an overview of the year ahead as a Fogarty trainee and member of a research team. Session topics focused on a range of topics, including global health ethics, collaboration best practices, decision-making, project management, community engagement, safety, time management, policy impact, as well as advice for an ongoing career. The orientation also provides networking opportunities for fellows, including an optional morning run with Dr. Craig R. Cohen, professor at the University of California, San Francisco.

Fogarty fellows congregate outside Stone House on NIH's campus.

LAUNCH structure

Cohen is director of the GloCal Consortium, one of seven total LAUNCH consortia, each with its own unique program and application process. LAUNCH builds on successes and experiences of past programs (all informally referred to as the "Fogarty Fellows and Scholars program").

In little more than 20 years, LAUNCH—a recently adopted name that better reflects the program's intentions—has grown from a scant 35 scholars at 14 research institutions per year to supporting more than 100 scholars at over 60 research institutions and sites each year. Now in its fifth cycle, the program maintains the consortia structure, with a focus on training predominantly postdoctoral fellows from the U.S. and LMICs plus U.S. predoctoral students.

Among 2024 orientation's standout features was a comprehensive discussion of global health research by Dr. Joia Mukherjee, associate professor and director of the master of medical sciences in global health delivery at Harvard Medical School. Mukherjee stated that inequity is lethal, given that social forces, such as classism and racism, have both magnitude and direction. Health equity, then, is essentially remediation. Equity, as defined by Mukherjee, is overcoming those factors that infringe on fairness so that all people have access to the resources for remaining healthy or achieving

positive well-being.

"This is not charity; this is retrospective justice," she said, noting the need to identify past wrongs and remedy them.

Building health care infrastructure

The legacy of colonialism translates to some countries having less than $5 per capita for health, explained Mukherjee. At best, this small amount of money pays for GOBI administered by volunteers. "GOBI" (which stands for Growth monitoring; Oral rehydration therapy for diarrhea management; Breastfeeding promotion; and Immunization) represents the World Health Organization's primary care initiatives. She concluded that the only way to turn the tide on global health is by shifting cashflows toward training physicians and nurses, while building healthcare infrastructure, including systems and social support.

New this year was a workshop focused on pitching to media facilitated by the Fogarty communication's team, and Dayna Kerecman Myers, managing editor of *Global Health Now*, a publication of Johns Hopkins Bloomberg School of Public Health. The workshop allowed trainees to assemble into small groups to exchange ideas and pitch their research stories to Myers, who gave constructive feedback.

One of the most moving pitches came from a Peruvian fellow, whose project deals with communication issues between health care providers and patients in rural areas of the Amazon; his pitch included the example of a man who unknowingly lived with HIV for more than a year because doctors could not reach him.

While Fogarty's orientation program has changed over the years, the fundamental driving force persists: to inspire early-career researchers. In total, more than 1,300 pre- and postdoctoral trainees and other health-related professional participants have conducted research through this trainee program, resulting in more than 2,400 peer-review publications in a variety of infectious and non-communicable disease areas. Fogarty has not only launched the careers of hundreds of researchers, but also supported health and biomedical research with far-reaching applications.

For more information about Fogarty's Global Health Program for fellows and scholars, see: https://go.nih.gov/sgVrndf.

NIGMS Staff Volunteer at a Wider Circle

In August, several National Institute of General Medical Sciences (NIGMS) staff, including the institute's director and deputy director, and their family members volunteered at A Wider Circle in Silver Spring, Md. The non-profit organization aims to advance equity in the greater Washington, D.C. region by fostering the exchange of goods, skills and connections from neighbor to neighbor.

A Wider Circle offers an essential support program, which focuses on providing household items such as furniture, kitchen supplies, toys, professional clothing and accessories for those seeking to rise out of poverty.

NIGMS staff, including Director Dr. Jon Lorsch and Deputy Director Dr. Dorit Zuk, and their family members volunteer at A Wider Circle.

PHOTO: SCOTT BUCHAN / A WIDER CIRCLE

NIGMS volunteers assisted this program's efforts, helping to sort donations and stock the showrooms where clients select their items. According to NIGMS's Joanna Dimas who organized the event, "We were also fortunate enough to receive a tour of the facility and interact with a few customers visiting the showroom as they selected their items to take home."

Contribute to Feds Feed Families Campaign

BY MAHELATE SOLOMON

Help provide families in need with nutritious meals. NIH's Feds Feed Families campaign is accepting donations until Sept. 30.

The program, initiated by the U.S. Department of Agriculture, aims to help connect workers across federal agencies with local community food banks.

"The mission behind the Feds Feed Families Program was really to find a way for the federal government to help provide families in need with much-needed food resources that they struggle to get," explained Amenities Programs Branch Chief Gregg Nelson.

Nelson, who arrived at NIH a little over a year ago, oversees outreach and is organizing this year's campaign. Although primarily virtual, there have been in-person components, including events with local markets hosting food donation trucks. Those interested in donating somewhere directly can also visit one of NIH's local food bank partnerships at the Children's Inn at NIH, Safra Family Lodge, Capital Area Food Bank and the Manna Food Center.

"People really want to have that physical exchange of knowing they're getting involved by putting a can in a bin or in a donation truck," said Nelson.

Nelson, alongside FFF ambassadors from each of NIH's institutes and centers, have set a goal of donating 150,000 pounds of nonperishable goods over the course of the year.

"Goods (can) mean dry packaged products like pastas, and [other products] that have a long, stable shelf-life," Nelson said.

NIH'ers who wish to donate can connect with their IC ambassador to find out where they can donate groceries or cash. Donations also can come in the form of volunteer hours. If you donate in any way, you are encouraged to register your donation under the NIH on the national donation tracker: https://rb.gy/7slmni.

"Families who benefit from this program are struggling to get the foods they need to live a healthy lifestyle," he said, "and so we are getting involved in helping to nourish and feed these families."

To donate, or to learn how to get involved, see go.nih.gov/J5MoymN.

Sleep

CONTINUED FROM PAGE 1

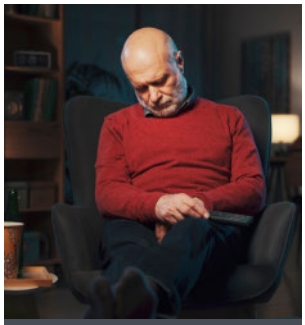
sleep center in the mammalian brain. Recent research instead reveals a larger, distributed and interconnected network of sleep neurons across the brain and beyond.

Dr. Yang Dan, a neurobiology professor at the University of California at Berkeley, recently shed light on the biology of slumber to a packed room in the Porter Neuroscience Research Center. She delivered the Newcomb Memorial Lecture, part of the NIH Neuroscience Seminar series.

"Sleep is an essential innate behavior," said Dan. "We actually know how to do this before birth. We spend a lot of time sleeping in our mothers' wombs."

The methods for detecting and measuring sleep differ depending on the type of creature being studied. For non-mammalian animals, sleep is detected by lack of movement. A *Drosophila* fly, for example, has a sleep episode if it stays still for five minutes.

A mammal's sleep can be recorded on electroencephalogram (EEG) to distinguish non-REM sleep versus REM sleep. Another type of test, electromyography (EMG) measures somatic motor activity (voluntary movement), which is present but decreases during sleep. In humans, in addition to EEG and EMG, doctors test sleep quality by monitoring heartbeat and breathing.



Nodding off: People lose neck muscle control when they doze.

STOCK-ASSO/SHUTTERSTOCK

In animals and humans, Dan noted the close association between motor control and sleep.

"This is why if you fall asleep during my talk, the first thing I'll notice is that you'll nod off because you lose your neck muscle [control]," Dan quipped.

Dan's research expands on this connection. "Falling asleep is not just about changes in our state of consciousness or brain state that you can measure with an EEG," she said. "It's also about reduction of somatic and autonomic motor activity. In the mammalian brain, neurons putting us to sleep are part of motor circuits controlling [this] motor activity."

But the research field didn't always link sleep and motor control.

A century ago, the Austrian neurologist Dr. Constantin von Economo determined one specific brain region—the preoptic area of the hypothalamus (POA)—promoted sleep by inhibiting neuromodulating systems. That's still true. But subsequent studies reveal sleep-promoting neurons in the lower brain stem and the medulla. It turns out, there's a network of sleep neurons across the brain and in the cardiovascular system.

'We accidentally stumbled upon a midbrain region that promotes non-REM sleep quite powerfully," Dan said. "So it seems the sleep-promoting mechanism is more distributed than the standard textbook model."

Dan's team began screening select brain regions. Interestingly, a postdoc in her lab found some that some neurons in the amygdala, a brain structure known to be important for emotional regulation, promoted sleep.

Another postdoc found sleep neurons in part of the basal ganglia that controls motor activity. They observed that transitions between behavioral states were not random. A running mouse doesn't fall asleep seconds after it stops running. Instead, changes are gradual, from big movements to small movements to quiet wakefulness to sleep.

"Sleep is really just a last step in a series of transitions that reduce both mental arousal and motor activity," Dan said.

"If you're a systems neuroscientist like me and you optogenetically [controlling neurons with light] activate some neurons in the brain, and you see that every time you turn on the laser, the mouse stops running and starts doing other things, you would say: 'I found some neurons involved in motor control'...For each of these transitions, there are changes in both EEG (brain state) and EMG (motor activity)."

So for the fly and the jellyfish and other animals with simple nervous systems, sleep likely functions to suppress motor activity.

Dan (l) fields a question during the Q&A after her lecture in the Porter Neuroscience Center.

"It's only in animals with more complex brains like us where this reduction of brain arousal becomes more important," Dan speculated. "For those animals, brain states and motor states can be coordinated...by the same sleep neurons that control motor activity and brain states together."

Why people sleep has a straightforward functional answer but a more complex biological one. Sleep deprivation causes a range of impairments. Getting good sleep enhances learning, memory, mood, the immune and cardiovascular systems and other mind and body functions.

"Sleep benefits all of these different systems," Dan said.

But does sleep support multiple independent processes and functions or is there a single fundamental process underlying all of the effects?

Dan and team cannot answer this yet but the investigator has a hypothesis. She thinks that inactivating catecholamine—arousing neurotransmitters such as dopamine and noradrenaline—underlies multiple functions of sleep. This is the line of research her team is currently pursuing.

Catecholamine neurons also may yield clues in other research areas. These neurons are especially vulnerable to metabolic stress. They die early in Parkinson's and Alzheimer's diseases, and sleep deficits can speed up disease progression.

"One possibility is that sleep simply allows these neurons to take a break and rest and recover from the high metabolic stress caused by high activity during wakefulness," Dan said. "Maybe shutting down these neurons during sleep once in a while is important not only for their own health and well-being, but also for the other tissues and organs through their interactions with all these other systems."

Candidate Malaria Vaccine Provides Lasting Protection

RICCARDO MAYER/SHUTTERSTOCK

Two NIH-supported trials of an experimental malaria vaccine in healthy Malian adults found that all three tested regimens were safe.

One of the trials enrolled 300 healthy women ages 18 to 38 who anticipated becoming pregnant soon after immunization. That trial began with drug treatment to remove malaria parasites, followed by three injections spaced over a month of either placebo or the investigational vaccine at one of two dosages. Both dosages of the vaccine candidate conferred a significant degree of protection from parasite infection and clinical malaria that was sustained over two years without a booster dose—a first for any malaria vaccine.

In an exploratory analysis of women who conceived during the study, the vaccine offered significant protection from malaria in pregnancy. If confirmed through additional clinical trials, the approach modeled in this study could open improved ways to prevent malaria in pregnancy.

Malaria parasites such as the species *Plasmodium falciparum (Pf)* can cause illness in people of any age, but pregnant women, infants and very young children are especially vulnerable. Malarial parasitemia in pregnancy causes an estimated 50,000 maternal deaths and 200,000 stillbirths in Africa each year.

The trials were co-led by investigators from NIAID and the University of Sciences, Techniques and Technologies, Bamako (USTTB), Mali. The investigational vaccine used in both trials was PfSPZ Vaccine.

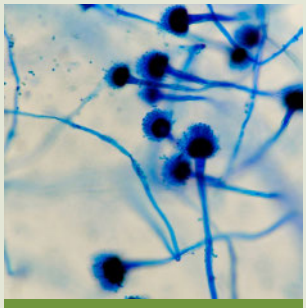
In the first year of the current trial, 55 women became pregnant following the vaccination regimen. Vaccine efficacy against parasitemia (before or during pregnancy) was 65% in the low dose group and 86% in the high dose group. Among 155 women who became pregnant across both study years, the lower and higher dose vaccines were 57 and 49% effective, respectively.

"Preconception immunization is a new strategy to reduce [malaria] mortality for women in pregnancy," the researchers note. They plan to investigate the safety of PfSPZ administered during pregnancy, then examine its efficacy given preconception or during pregnancy in larger clinical trials.

NIH Develops Imaging Method to Detect Fungal Infection

Researchers at NIH's Clinical Center and the National Heart, Lung and Blood Institute have developed and tested a new imaging method that will allow specific detection of *Aspergillus fumigatus* fungal infections in a timely manner in the future, without the need for invasive procedures. Delays in diagnosing fungal infections caused by Aspergillus and other fungi can put immunocompromised patients at risk for more serious illnesses or even death.

Due to their presence in the environment, many fungi evolved to use other sources of fuel besides glucose, such as by breaking down complex sugars into simple ones to produce energy. Aspergillus can break down a specific sugar, cellobiose, into two glucose molecules, while most other microbes and human cells cannot. The researchers developed a radioactive version of cellobiose which when injected in the blood can be visualized in the body using positron emission tomography (PET) scanners.



NIH researchers developed and tested a new imaging method to detect Aspergillus fumigatus fungal infections.

PHOTO: SRMY/SHUTTERSTOCK

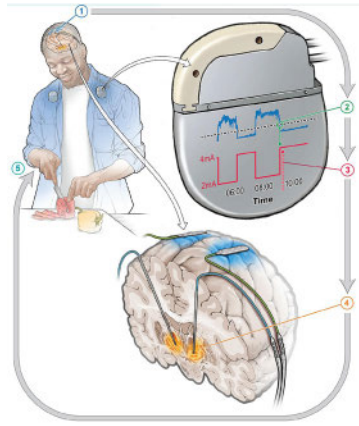
In this study, radioactive cellobiose was injected in mice with fungal infections and then imaged using a specialized PET scanner for small animals. The mice showed accumulation of radioactivity, while mice with bacterial infections or with non-infectious inflammation did not.

Researchers also found that the same radioactive tracer can determine if the mice with fungal infections are responding to treatment through PET images taken before and after starting treatment.

The study was funded by the Center for Infectious Disease Imaging (CIDI), a joint initiative between Radiology and Imaging Sciences (RIS) at the NIH Clinical Center and the National Institute of Allergy and Infectious Diseases (NIAID), in collaboration with the Chemistry and Synthesis Center (CSC) at NHLBI.

Self-Adjusting Brain Pacemaker May Help Reduce Parkinson's Symptoms

A small NIH-funded feasibility study found that an implanted device regulated by the body's brain activity could improve treatment for the symptoms of Parkinson's disease (PD) in certain people with the disorder. This type of treatment, called adaptive deep brain stimulation (aDBS), is an improvement on a technique that has been used for PD and other brain disorders for many years. The study found aDBS was markedly more effective at controlling PD symptoms than conventional DBS treatments.



Implanted device responds to changes in brain biomarkers of Parkinson's symptoms by adjusting stimulation STARR LAB, UCSF

DBS involves implanting electrodes into the brain at specific locations, which deliver electrical signals to help mitigate the symptoms of brain disorders such as PD. Conventional DBS provides a constant level of stimulation and can also lead to unwanted side effects, because the brain does not always need the same strength of treatment. Conversely, aDBS uses data taken directly from a person's brain and uses machine learning to adjust the level of stimulation in real time.

aDBS treatment was given to four people already receiving conventional DBS. The patients reported involuntary movements or difficulty in initiating movement as their most bothersome symptom that persisted despite DBS treatment.

aDBS improved each participant's most bothersome symptom roughly 50%. Notably, even though they were not told which type of treatment they were receiving at any one time, three of the four participants were often able to correctly guess when they were on aDBS due to noticeable symptom improvement.

Conventional treatment for PD often involves the drug levodopa. The amount of the drug in the brain peaks shortly after administration and gradually decreases as it is metabolized. aDBS could help smooth out the fluctuations, making it an attractive option for patients requiring high doses of levodopa.

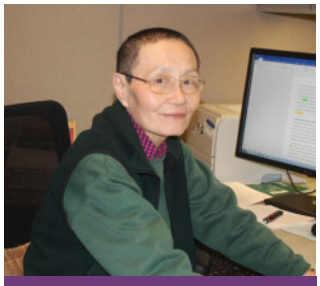
Significant challenges remain for this therapy to be more widely available. Initial device setup requires considerable input from trained clinicians. Researchers envision a future where most of the work would be managed by the device itself, greatly reducing the need for repeat clinic visits. Further testing is needed before aDBS therapy can be offered in a clinical setting.

NCI's Hu Retires After 32 Years of Service

Dr. Nan Hu, staff scientist in the Metabolic Epidemiology Branch (MEB) of the Division of Cancer Epidemiology and Genetics (DCEG) at the National Cancer Institute (NCI) retired in July after 32 years of service.

Hu integrated her training, experience and skill in widely varied but complementary disciplines—molecular genetics, bench work, epidemiologic field studies and statistical analysis—to play a fundamental role in MEB's research on the etiology, prevention and early detection of upper gastrointestinal cancers.

Hu received her medical degree from the Shanxi Medical College in Taiyuan, China in 1976, followed by a master's degree in cytogenetics and medical genetics from the Beijing Medical College. After completing a doctorate in cancer genetics from the Peking Union Medical College under the mentorship of Dr. Wu Min, she served as a postdoctoral fellow with Dr. Janet Rowley at the University of Chicago, Illinois before coming to the NCI, first as a visiting associate, and then as a postdoctoral fellow with Dr. Dean Hamer.



NCI's Dr. Nan Hu

She joined the Cancer Prevention Fellowship program in 1994, earning an M.P.H. in epidemiology and biostatistics from the George Washington University in the process. Hu joined DCEG as a staff scientist and conducted research with several investigators, most recently in MEB.

Hu worked closely with Dr. Phil Taylor and Dr. Alisa M. Goldstein, senior investigators in the DCEG, to complete large-scale international multidisciplinary studies of esophageal and gastric cancer. This genetic-focused work included genome-wide association studies of esophageal squamous cell carcinoma, gastric cardia adenocarcinoma and gastric noncardia adenocarcinoma, as well seminal molecular genetics studies of these same tumors.

Her work created a trove of biological samples that will be used for tumor sequencing studies for years to come. Most recently, she worked with a large international team to complete a whole genome sequencing study of esophageal squamous dysplasia, the precursor lesion for ESCC. **—Jennifer K. Loukissas**

NIEHS Scientist Honored for Contributions to Myositis Research

BY CAROLINE STETLER

Dr. Lisa Rider

PHOTO: BILL BRANSON

Before the advent of recent treatments, the autoimmune muscle disease known as myositis was deadly. Of the patients who did survive, many were severely physically disabled.

Rare diseases like myositis are often challenging to study and treat because the smaller number of cases makes it difficult to draw scientific conclusions. However, Dr. Lisa Rider, a pediatric rheumatologist who leads the National Institute of Environmental Health Sciences (NIEHS) Environmental Autoimmunity Group, has been at the forefront of collaborations to identify genetic and environmental risk factors for myositis in children, classify patients' symptoms, and uncover cellular markers of disease progression and treatment response. In addition, her work to measure how patients respond to treatment led to the successful development of the first Food and Drug Administration-licensed product to treat myositis in several decades.

NIEHS Clinical Director Dr. Janet Hall (l) and NIEHS Scientific Director Dr. Darryl Zeldin (r) celebrate Rider's induction into the AAP.

Earlier this year, Rider was inducted into the Association of American Physicians during a ceremony in Chicago. Founded in the 1800s, AAP membership is limited to physician-scientists who have made impactful research contributions to advance biomedical science, medicine or health.

"Dr. Rider's seminal research has substantially contributed to our understanding of how autoimmune muscle diseases develop, can be divided into mutually distinct phenotypes and how they are best assessed and treated," the AAP wrote in announcing Rider's selection.

"The fact that AAP is a national society and only has about 1,800 active members across the country and all disciplines of medicine—including pediatrics, surgery, OB-GYN, and psychiatry—is a real testament of the honor of becoming a new member," said NIEHS Clinical Director Dr. Janet Hall. "It is highly competitive."

A leader in diagnosing patients

Myositis, which occurs when the immune system goes awry and attacks healthy muscles and other tissues, affects approximately 75,000 people in the U.S. each year. Although the disease is considered rare, it may be underdiagnosed, with recent reports of some forms of myositis in children being mistaken for muscular dystrophy.

Although symptoms vary among patients with the disease, children with the most common form of myositis — known as juvenile dermatomyositis — often present with characteristic rashes on the eyelids or over the knuckles, elbows or knees. According to Rider, patients also can have photosensitive rashes, which are rashes brought on by exposure to sunlight. Muscle weakness close to the center of the body and in the shoulders or hip girdle is another common symptom.

Understanding how the disease presents differently and linking those symptoms to the presence of specific autoantibodies allowed Rider and her team to identify distinct subgroups of patients. Unlike antibodies generated by a healthy immune system to fight viruses, autoantibodies attack substances made by a person's own body and are a hallmark of autoimmune diseases.

Thanks to Rider's discovery of the anti-TIF1-gamma autoantibody, in collaboration with Dr. Ira Targoff and colleagues, clinicians around the world can now order blood tests to look for specific autoantibodies present in their patients. These autoantibodies can indicate whether a patient's health outcomes will be more or less severe.

Rider with NIEHS collaborator Dr. Frederick Miller also created a national registry to pool patient data. They characterized participating patients across North America by demographics, environmental exposures, clinical features, responses to treatments and disease outcomes.

This scoring system is now widely used in clinics and endorsed by the American College of Rheumatology and European Alliance of Associations for Rheumatology.

Discoveries on the horizon

Rider's research to assess gene and protein regulation in children and adults with dermatomyositis is helping to identify new pathways that may be targeted for therapy.

She recently received funding to evaluate how the levels of chemicals and other environmental exposures differ between identical twins and close-in-age same-gender siblings, specifically when one twin or sibling has an autoimmune disease and the other does not.

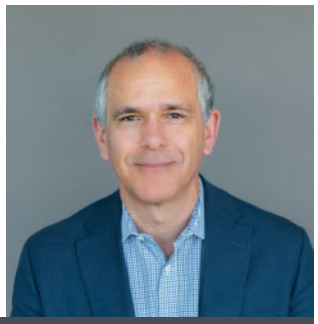
NIEHS Scientific Director Dr. Darryl Zeldin said, "Dr. Rider's work is a wonderful example of our investment in physician-led science to transform understanding of a rare disease and translate that knowledge to improve patients' lives."

NIMHD Hosts Workshop on U.S. Global Burden of Disease

BY ELOHO ESE BASIKORO

The National Institute on Minority Health and Health Disparities (NIMHD) recently hosted a workshop on the U.S. Health Disparities Global Burden of Disease (GBD) project, featuring leaders and scientists from the Institute for Health Metrics and Evaluation (IHME), University of Washington, Seattle.

Dr. Christopher Murray, professor and chair of health metrics sciences and director of IHME, presented the results of the GBD 2021 report with topics that included life expectancy, cause-specific mortality and disease risk factor comparisons across countries. Dr. Laura Dwyer-Lindgren, associate professor of health metrics sciences at IHME, discussed the GBD project. Dr. Ali Mokdad, professor of health metrics sciences at IHME, ran a workshop on how to use the GBD data. Dr. Joseph Dieleman, associate professor of health metrics sciences at IHME, presented on health care spending within the U.S.



Clockwise from top l: Dr. Ali Mokdad, Dr. Laura Dwyer-Lindgren, Dr. Christopher Murray and Dr. Joseph Dieleman

Highlights of the presentations included that between 2000-2019:

- The U.S. ranked among the lowest in life expectancy compared to other high-income countries.
- Among racial and ethnic minority populations, American Indian and Alaska Native (AIAN) and Black populations had the lowest life expectancy, while Asian and Latino populations had the highest life expectancy. The White population had intermediate life expectancy: higher than life expectancy among AIAN and Black populations but lower than life expectancy among Latino and Asian populations.
- For most causes of death, mortality rates were highest for AIAN and Black populations and lowest for Asian and Latino populations. However, the size of the disparity, and the trends over time, varied considerably among causes.
- By geography, regardless of race and ethnicity, a huge disparity of up to 27 years difference in life expectancy was found across counties, with the lowest life expectancy at 65 years and highest at 92 years.
- Counties in certain regions (e.g., Southeast, Appalachia, Four Corners) had relatively poor outcomes across a wide range of metrics, including life expectancy and cause-specific mortality.
- Racial and ethnic disparities in life expectancy and cause-specific mortality observed nationally were also found in nearly all counties.

The GBD project is a systematic, scientific effort to quantify the magnitude of major diseases, risk factors and clinical outcomes by age, sex, race, ethnicity and geography over time. It uses available national data to create small area estimation models and tools to produce a comprehensive, comparable picture of all forms of health outcomes (diseases, injuries, impairments) so that health systems can be improved to reduce health disparities. The GBD project also uses predictive models to forecast future disease and health scenarios.

Speaking on the observed disparities, Dwyer-Lindgren noted that health disparities are the norm, not the exception, across geography, race and ethnicity in the U.S. and that the size of the disparities are large, even on a global scale. This theme resonated across several presentations. Nevertheless, the findings present opportunities that policymakers can leverage to drive policy decisions to reduce health disparities and achieve health equity.

"Achieving equity in health also entails tracking health care spending to determine where health care dollars come from, where it goes and who it serves," said Dieleman. He noted vast disparities across geography, race and ethnicity in U.S. health care spending between 2010-2019, with higher personal health care spending in places with more income.

Preliminary estimates showed health care spending was lowest for racial and ethnic minority populations compared to the White population: in 2019, 76.2% of total U.S. health care spending was by the White population, while the AIAN population had the lowest health care spending at 0.7%.

Further framing the conversation around health disparities and the economics of health care, NIMHD Director Dr. Eliseo J. Pérez-Stable added, "the issue of health care spending is an important and critical conversation to have because it contributes to health disparities and outcomes based on the way the United States leverages the percentage of gross domestic product it spends on health, which is more than any other high-income country but with much worse outcomes."

GBD data on health care spending can help policymakers understand where resources are being directed and who is benefiting, whether at the county, state or national level, and how disparities in health care spending are shifting over time. Additionally, the data can help to reduce inefficiencies in health care spending at the population level.

The U.S. GBD project continues to furnish updates on diseases, injuries and risk factors, which policymakers can use to prioritize interventions to improve health and save lives. Donors, researchers and the public also can use the data and forecasts to assess the impact of new policies, interventions or technologies on health.

The workshop was organized by the NIMHD-led U.S. Health Disparities GBD working group at NIH (comprising researchers from the National Heart, Lung, and Blood Institute; National Cancer Institute; National Institute on Aging; National Institute of Arthritis and Musculoskeletal and Skin Diseases; Office of Disease Prevention; and Office of Behavioral and Social Sciences Research), in partnership with IHME.

VHA Summer Program Brings Students from Puerto Rico, Baltimore

BY DOUG ROJAS, EMERIE GAINES, AND KIANA ATKINS

Under the Veterans Health Administration Summer Program, a group of students from Baltimore and Puerto Rico embarked on an inspiring journey through the halls of NIH.

The visit—organized by Dr. Ingrid Bonilla-Mercado and Dr. Beth Hogan from the neurology department at Johns Hopkins School of Medicine, along with Patricia Sauceda Kramer and staff from NIH's Office of Equity, Diversity, and Inclusion (EDI)—offered these budding researchers an immersive experience into the world of medical innovation.

The day began with an inspiring keynote by Dr. Roland Owens, acting principal deputy director in the Office of Intramural Research, who set an uplifting and motivational tone. From there, the students were ushered into Dr. Lawrence Latour's lab in the National Institute of Neurological Disorders and Stroke. There, they explored the cutting-edge uses of MRI technology in diagnosing and treating traumatic brain injury (TBI). This session allowed the students to bridge their academic knowledge with real-world applications, offering a tangible glimpse into the daily workings of medical research.

Later that afternoon, the cohort engaged with Dr. Mario Penzo and Dr. Veronica Alvarez from the National Institute of Mental Health, and Dr. Maio Nunziata and Dr. Meghan Bohn from Eunice Kennedy Shriver National Institute of Child Health and Human Development. These stimulating discussions provided a deep dive into many areas of neurological research.

Each encounter was more than an academic exchange; it was a mentorship moment, filled with personal stories, guidance and inspiration. The researchers shared their personal journeys, challenges and triumphs, painting a vivid picture of the diverse career paths within biomedical research. These personal stories, filled with resilience and passion, deeply connected with the students.

Reflecting on the day, Chris Jackson of EDI emphasize8d the broader goals of the visit. "We wanted to show these aspiring scientists the cutting-edge research at NIH. Our goal was for them to envision themselves as future contributors to medical science and to realize the many career opportunities available to them."

The cohorts plan to return next July, and the EDI team looks forward to creating the next experience for them.

Back row (from l): Dr. Beth Hogans; Dr. Lourdes Guerrios; Dr. Irma Molina; Ana Lopez; Gerardo Jovet; Dr. Ingrid Bonilla; Sara Ocasio; Sofia Laguna; Jeevan Rivera; Emmanuel Colon; Chris Jackson; Monique Robinson. Front row: Doug Rojas, Jasmin Wu, Alejandra DeAngel; Aalaya Campbell, Hermoine Cordeiro, Emerie Gaines **PHOTOS: DOUG ROJAS**

Above, the students pose in the Porter Neuroscience Center. Below, they congregate outside Bldg. 1.