

‘SPORT OF THE BRAIN’ NIAID’s Lin Leads Robotics Team as FIRST Coach

BY AMBER SNYDER

The pink robot, pride of the Almond Robotics team, fended off challenges from black and green robots as it raced to fill a tower with yellow blocks. Four robots in total dueled in the square-shaped arena, cheered on by bleachers full of enthusiastic spectators, but Almond Robotics deposited one more block at the last second and ultimately came out on top.

“It’s comparable to a basketball game,” said Almond team coach Dr. Dawei Lin, describing the tournament. Lin is a volunteer for the organization For Inspiration

and Recognition of Science and Technology (FIRST). He’s also the associate director for bioinformatics and senior advisor to the director in NIAID’s Division of Allergy, Immunology and Transplantation.

FIRST is an international youth robotics community that currently serves 110 countries and roughly 679,000 students. It’s a nonprofit run entirely by volunteers. It was founded in 1989 by Dean Kamen, an engineer and innovator who is also known for inventing the Segway vehicle and the iBOT mobility



NIAID’s Dr. Dawei Lin cheers his team on from the stands at the 2022 FIRST Chesapeake District Championship.

PHOTO: COURTESY DAWEI LIN

system. Despite having these famous devices on his resume, Kamen has said FIRST is his best invention.

SEE **FIRST**, PAGE 6

NIH’ers Featured on Celebrity Renovation Show

BY ERIC BOCK

Two NIH scientists recently appeared on CBS’s *Secret Celebrity Renovation*, a reality television series that allows actors, musicians or athletes a chance to give a surprise home makeover to someone who helped them succeed.

In the episode, which aired on Aug. 26, NCI’s Dr.



Show host Nischelle Turner (l) with actor Utkarsh Ambudkar (second from right) and his NIH’er parents, Suresh and Indu

SEE **RENOVATION**, PAGE 8

‘BRING IT ON! I’M READY’ CSR Division Director Hit the Ground Running

BY DANA TALESNIK

It’s never too late to make a healthy lifestyle change. One motivated NIH’er turned his personal fitness challenge into a hobby he loves—one that truly cured what ailed him.

When Dr. Dipak Bhattacharyya was in his early 40s, he knew something had to change. He was sedentary, fatigued and highly diabetic.

“Being a scientist, I tended to spend so



Dr. Dipak Bhattacharyya

SEE **RUNNER**, PAGE 4



NIH Common Fund investment in African gene-environment research marks 10-year milestone. See p. 7.

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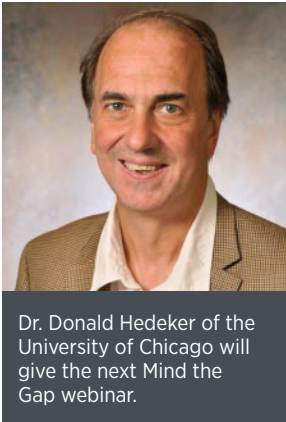
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Hedeker To Present Methods Webinar, Oct. 20

The Office of Disease Prevention will hold a Methods: Mind the Gap webinar on Thursday, Oct. 20 at noon ET featuring Dr. Donald Hedeker, professor of biostatistics in the department of public health sciences at the University of Chicago. He will discuss multilevel models for data analysis.

Multilevel models are useful for analysis of data in which subjects are nested within some kind of cluster (e.g., students in schools). Such models assume that each subject belongs to only one group.

However, students might be nested within primary and secondary schools, where not all students from the same primary school go to the same secondary school. In this case, there is a crossing of the two types of clusters (i.e., primary and secondary schools), and cross-classified multilevel models are necessary for appropriate data analysis.



Dr. Donald Hedeker of the University of Chicago will give the next Mind the Gap webinar.

Hedeker's chief expertise is in the development of statistical methods for clustered and longitudinal data, with particular emphasis on mixed-effects models. He has developed methods and software for analysis of intensive longitudinal data, which are data with many measurements over time, often collected using mobile devices and/or the internet.

Registration is required for the webinar; visit prevention.nih.gov/education-training/methods-mind-gap/introduction-cross-classified-multiple-membership-and-dynamic-group-multilevel-models. The webinar will be recorded and available on the ODP website within approximately 2 weeks.

The Mind the Gap series explores research design, data analysis and other methods of interest in prevention science. For details, visit prevention.nih.gov/MindTheGap.

Next-Generation Covid-19 Diagnostics Sought

NIH has issued two new funding opportunities for diagnostics manufacturers to develop the next generation of Covid-19 tests with a focus on accessibility. The new programs may award up to \$300 million in funds from the American Rescue Plan Act of 2021 for developing new, accessible tests.

The funding opportunities are part of the Rapid Acceleration of Diagnostics (RADx) Tech program, managed by NIBIB.

The first solicitation is for accessible over-the-counter tests that can be used by people with



Dr. Lawrence Tabak, performing the duties of NIH director, speaks at a Capitol Hill reception to celebrate medical research on Sept. 13.

PHOTO: JOHN BURKLOW

Tabak on Capitol Hill for Medical Research Rally Event

Dr. Lawrence Tabak, performing the duties of NIH director, addressed a Reception to Celebrate the Lifesaving Research that NIH is Supporting on Sept. 13 at Rayburn House Office Building cafeteria. The event preceded the Rally for Medical Research, which has been held annually since 2013 on Capitol Hill.

This year marked the 10th anniversary of the rally, which every September gathers a broad coalition of groups representing the medical research advocacy community to meet with House and Senate offices in Washington, D.C. to urge members of Congress to make funding for NIH a national priority. The rally is coordinated by the American Association for Cancer Research and supported by nearly 350 partner organizations. According to the website, "Our goal is to have meetings scheduled with all 535 members of Congress, which would make this the biggest rally ever!"

A bipartisan effort, the event heard from congressional leaders from both sides of the aisle and this year included a tribute to the late former Congressman John Porter, a longtime strong supporter of NIH who was instrumental in the rally's formation.

"I want to thank all the advocates...who will be talking to Congress...That's what helps members of Congress understand the need for funding of medical research," said Tabak.

disabilities—specifically blindness, low vision, fine motor skill difficulties and aging-related disorders. Products should be ready for commercialization in 12-24 months.

The second solicitation focuses on improving performance of over-the-counter and point-of-care tests as well as integrating universal design features to ensure ease of use. Tests should aim to minimize or eliminate the need for serial testing and performance should be unaffected by variants. Products should be ready for commercialization in 24-36 months.



This effort builds on a highly successful program that has increased U.S. testing capacity by billions in the span of 2 years and compressed the technology development timeline from years to months. Applications are being accepted now.

For details, see: <https://www.nibib.nih.gov/covid-19/radx-tech-program>. Programmatic or technical questions? Email info.radx@pocntrn.org.

NIBIB Announces Tech Challenge Winners

NIH and VentureWell announced the winners in their 11th annual Design by Biomedical Undergraduate Teams (DEBUT) Challenge. The 9 winning teams and 5 honorable mentions, who received prizes totaling \$130,000, designed technology solutions to unmet health care needs.

The winning diagnostic projects improve skin color biases in tests of blood oxygen saturation, identify Group B Streptococcus more accurately, measure cervical stiffness as a warning for pre-term birth, improve electrocardiograms (EKGs) for children and diagnose tuberculosis faster and more cheaply than traditional methods.

Therapeutic projects include a device to protect the brain post-surgery, artificial intelligence-guided physical therapy, a male contraceptive and a spoon to help patients with Parkinson's disease and essential tremor.

“With every new DEBUT Challenge, I am inspired by the creativity and ingenuity of young engineers from across the country,”



said NIBIB director Dr. Bruce Tromberg. “From projects that tackle bias in medical devices to bringing affordable and easy-to-use testing to underserved communities, student design projects are helping our community engineer the future of health.”

The DEBUT Challenge, initiated and led by NIBIB, was also supported by NIMHD, the NIH Office of AIDS Research (OAR), NCI and NICHD, along with VentureWell, a nonprofit network that supports science and technology innovation and entrepreneurship in higher education. The prizes will be presented during the annual Biomedical Engineering Society conference to be held in October.

DEBUT received 73 applications from 43 universities in 19 states, four countries (U.S., Canada, China, and Syria), engaging a total of 456 students this year.

The winning projects include:

‘Steven H. Krosnick’ First Prize: EquinOx, Johns Hopkins University

The EquinOx attempts to mitigate the bias that most pulse oximeters exhibit by failing to account for differing patient skin tones. Using new hardware that measures

both skin tone as well as raw pulse oximeter data with a newly developed algorithm, the EquinOx is better able to estimate blood oxygen saturation.

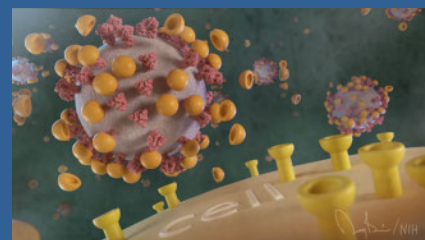
Second Prize: Ampliphage, Stanford University

The Ampliphage is an affordable, easy-to-use diagnostic tool that can detect Group B Streptococcus in low-resource settings. At 3 percent of the cost of current tests, it can help decrease infant mortality rates worldwide.

Third Prize: CERV, Columbia University

CERV is designed to monitor the risk of preterm birth by quantifying cervical stiffness without the use of a speculum in lower-resource clinical settings.

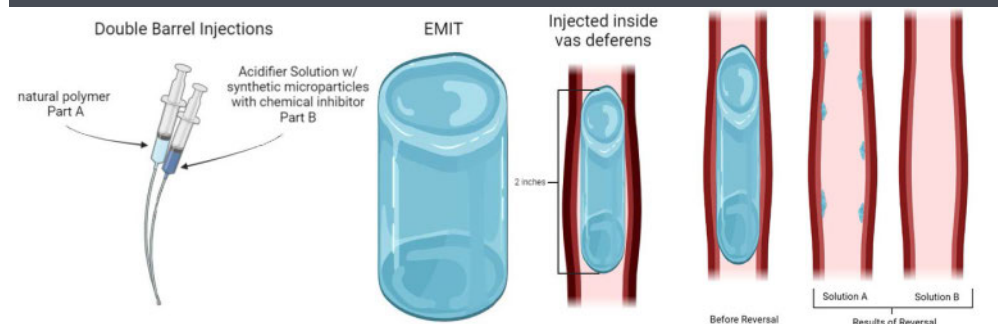
For the complete list of winners and their projects, see: <https://bit.ly/3DIG8fj>



ON THE COVER: A specially engineered protein decoy (orange) mimics the 3D structure of the ACE2 receptor and blocks viral spikes from attaching to our cells. Read more about this potential anti-COVID therapy in the NIH Director's Blog: <https://bit.ly/3QWk4ko>.

IMAGE: DONNY BLISS/NIH OCPL

Above left, first prize winner the EquinOx can estimate blood oxygen levels. At right, the NIH OAR Prize for HIV/AIDS went to POCAS, the Point-of-Care Automated Stainer for TB Diagnostics. Below, the VentureWell Venture Prize went to the EMIT, a minimally invasive male contraceptive that utilizes an injectable hydrogel.



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Editor:
Carla Garnett • Carla.Garnett@nih.gov

Associate Editor:
Dana Talesnik • Dana.Talesnik@nih.gov

Assistant Editor:
Eric Bock • Eric.Bock@nih.gov

Editorial Intern:
Amber Snyder • Amber.Snyder@nih.gov

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Bhattacharyya on a trail run

Then he learned about ultramarathons—runs that are longer than the standard 26.2-mile marathon. In January 2016, he completed a 32-mile trail run in North Carolina and did not feel tired afterward. Could he go even farther?

Next, Bhattacharyya ran a 50-miler and, on Dec. 31, 2016, he attempted his first 100-mile run: the Pistol Ultra in Tennessee. Racers had 30 hours to complete it, and he finished.

• • •

“I learned through this process that the human body is extremely powerful.”

-DR. DIPAK BHATTACHARYYA

• • •

“The beauty of these ultramarathons is they offer support,” said Bhattacharyya. “Every 6-10 miles, we’ll get water and food.” But after running numerous ultramarathons with such support, he decided it was time to kick it up a notch.

“I wanted something even more challenging with no one to support me, where I had to figure it all out for myself,” he said. So far, he has finished more than 120 ultra races, many of them with no support, where runners carry their belongings and find their own food, water and lodging.

It’s fair to say Bhattacharyya has become addicted to running and the resulting health effects. While running keeps him physically fit and reinvigorates his mind, he also has experienced another profound health change.

“Running took care of my diabetes [type 2]. It’s completely gone. I’ve been diabetes-free for 15 years,” said Bhattacharyya, who also made dietary changes and is now vegan.

“The good thing about picking up healthy habits is you gradually expand,” he said. “Because I already achieved this goal, I think: what’s the next thing?”

That next thing was a whopping 328-mile run in June that started in Kentucky. This run—the Heart of the South—traverses the Tennessee mountains. It’s so hot that runners pound the pavement at night and rest during the day.

“I was trying to discover myself, what I am made up of, whether I can really do this,” said Bhattacharyya, who was selected in a lottery for the race. “The major problem was the heat...It’s so hot. You get many blisters; your feet hurt. It’s very, very challenging. So I wanted to do that!”

Another major challenge was planning to stay fed and hydrated. Runners have 240 hours to complete the run. Barring an emergency, there’s no support and runners initially have no idea what they’re getting into.

“The beauty of this run is they won’t tell you anything in advance,” he said. “You don’t know the course. You park the car at the finish line. A bus picks you up. They put you in a hotel the night before and give you a map.” Then, runners fend for themselves back toward the finish line.

The run began with 90 people; 56 completed the race. Bhattacharyya was one of them, finishing in the middle of the pack.

One day, his 3-liter bottle leaked in his backpack and all the water had drained out. He was 23 miles from his motel and 8 miles

Runner

CONTINUED FROM PAGE 1

much time in the lab doing research and didn’t figure out I needed to take better care of myself,” said Bhattacharyya, a biochemist by training who formerly worked in an NCI cancer lab and later moved into information technology. He currently is director of the Division of Planning, Analysis and Information Management at the Center for Scientific Review.

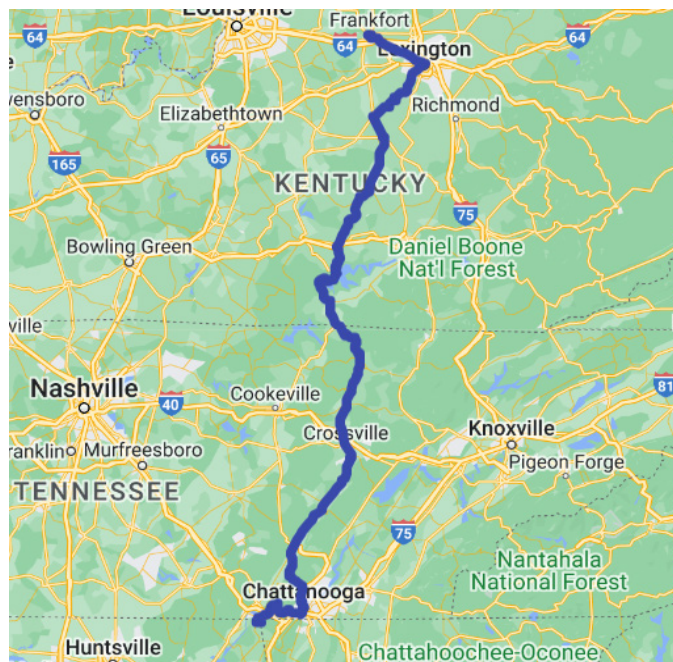
Bhattacharyya decided to try running. But on his first outing, he only had the endurance to run a quarter mile.

“Running became a challenge to me,” he said. “I started gradually, running a little bit every day, and in a year went up to 15 miles over each weekend. I started liking it and seeing the health benefit.”

In 2014, his children encouraged him to try running a marathon. That year, at age 51, he ran his first marathon.

“I’m an achiever type,” Bhattacharyya said. “If I’m sticking to something, I want to see it to the end.”

But it didn’t end there. Not long after his first, he began running a marathon a month. Unsurprisingly, he enrolled in a club called Marathon Maniacs and eventually was running a marathon per weekend.



A map of the 2022 Heart of the South, which took Bhattacharyya and dozens of other runners on a 328-mile journey, starting in Kentucky.

NLM Lovelace Lecture To Feature Elhadad, Oct. 11

'HUMAN-CENTERED AI APPROACHES'

Dr. Noémie Elhadad will present "Human-Centered AI Approaches for Individualized Self-Management Regimens," the NLM Ada Lovelace Lecture on Tuesday, Oct. 11 from 3 to 4 p.m. ET.

Personal health informatics solutions have been proposed to support self-management, to scaffold problem solving for individuals, and to promote experimentation that help identify potential triggers of disease flares across a range of health conditions. In many chronic diseases however, there is strong evidence of person-to-person variation in treatment responses and associated symptoms. In addition, there are often no predetermined policy guidelines for self-management and, if there are, individuals are left with the burden of translating them into their day-to-day lives.

Elhadad will discuss the challenges and research directions for augmenting personal health informatics systems with AI-driven recommendations for self-management strategies.

She is an associate professor of biomedical informatics, affiliated with Computer Science and the Data Science Institute at Columbia University. She serves as vice chair for research and graduate program director for the department of biomedical informatics. She leads Even, the Data-Powered Women's Health Research Initiative at Columbia University as well as the Citizen Endo project, which advances research in endometriosis through citizen science.

Elhadad's research interests are at the intersection of machine learning, natural language processing, medicine and technology. She investigates ways in which observational clinical data (e.g., electronic health records) and patient-generated data (e.g., online health community discussions, mobile health data) can enhance access to relevant information for clinicians, patients and researchers and can ultimately impact care and health of patients.

The talk will be broadcast live and archived at <https://videocast.nih.gov/watch=45956>.

Interpreting services are available on request. Individuals with disabilities who need reasonable accommodation should contact Queenmoore Okeke at queenmoore.okeke@nih.gov or the Federal Relay (1-800-877-8339). Send questions during the presentation to: nlmsd@mail.nlm.nih.gov.

Prado To Deliver Next NIMHD Seminar

The NIMHD Director's Seminar Series will feature Dr. Guillermo "Willy" Prado, vice provost for faculty affairs at the University of Miami, on Thursday, Oct. 6 at 2 p.m. ET. He will discuss "Reducing Health Disparities in Hispanic Families."

Prado's work focuses on development, evaluation and dissemination of parenting interventions for Hispanic youth and their families. The talk will highlight existing health disparities among Hispanic/Latinx youth and provide an overview of Familias Unidas, a preventive intervention for Hispanic sexual minority youth and their families.

The 2022 NIMHD series will be virtual; all presentations can be viewed live or later via NIH videocast: <https://videocast.nih.gov/watch=46196>.

Visit <https://bit.ly/3QWiG1a> to learn more about the series.



Bhattacharyya poses in front of the lighthouse on Bodie Island after completing a 50-mile run in the Outer Banks, North Carolina.

from any place selling drinks. Mercifully, a driver going by saw him and, without a word, sped off and returned with a bottle of water and a Gatorade.


On the trail, up and down the mountains on the highway shoulder, the asphalt scorching hot, he would run all night, rest a few hours, shower, pick up a sandwich and forge on for the next 40+ miles.

"I learned through this process that the human body is extremely powerful," he said. "You can do anything with your mind." Despite the intense heat, thirst and hunger, "I was able to handle it."

And he wants to do it again. "Bring it on! I'm ready," he said, having put his name into the lottery, and gotten accepted, to run Heart of the South, summer 2023.

Now 58 years old, Bhattacharyya still runs 10 miles every day and tries to inspire others to run. He encourages colleagues to participate in NIH runs and relays and has even persuaded a few to try running a marathon.

"I'm not telling everyone to run 350 miles," he said. "Run 2 miles a day or 1 mile. It will change your life. It changed mine.

"You just have to make the time. When you begin a fitness journey, it will become second nature, like breathing. Running has become such a part of my life that I feel tired if I don't go out and do it." 



Dr. Noémie Elhadad



Dr. Guillermo "Willy" Prado

FIRST

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FIRST has three programs that young people can participate in based on age and interest: FIRST LEGO League (FLL), where youngsters use LEGO to learn about robotics and engineering; FIRST Tech Challenge (FTC), where students build, design, code and compete robots; and FIRST Robotics Competition, in which older youths build industrial-sized robots and compete in a challenging field game.

Teams square off in regional contests, with the winners advancing to the world competition.

“Robotics is a sport of the brain,” Lin explained.

He learned about FIRST from an exhibit at the Maker Faire in the California Bay Area. His children were too young to participate at the time, but they became a “FIRST family” in 2013 after moving to Maryland. The kids started out on the FLL team and moved to FTC when they grew older, and now serve as mentors and coaches to younger students in the program.

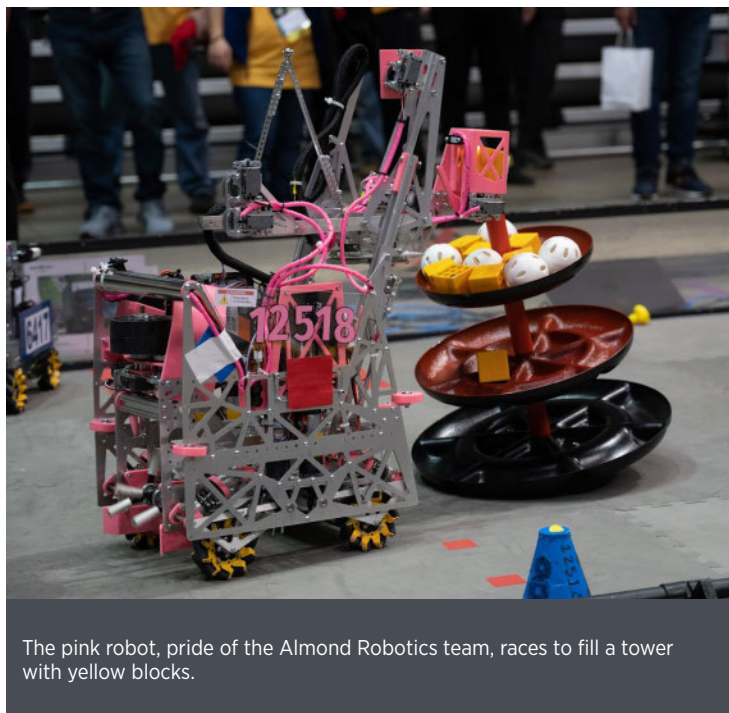
Watching the students grow and mature is one of Lin’s favorite things about FIRST. He has served as a coach and mentor for almost 10 years, often hosting teams in the basement of his home.

“[It’s incredible to watch the students grow] into young leaders who can impact society in a way they may not realize,” he said.

Many of the FIRST coaches and volunteers are engineers. Lin, as a bioinformatician, is unique in both his background and his manner of teaching.

“I mostly coach their thinking styles,” he explained. In school, he said, children are normally given problems to solve, hindering their ability to practice critical and innovative thinking. Lin addresses this lapse by trying to “teach before the problem,” or how to define the problem in the first place. The process is very similar to the scientific method, an apt teaching tool for an NIH employee.

Lin’s teaching style paid off last year: his FTC team won the championship title for the MD/DC/VA region and represented the region to compete with the top teams worldwide at the FIRST championship in Houston. Besides the team awards, Lin’s team also won the Dean’s List award three



The pink robot, pride of the Almond Robotics team, races to fill a tower with yellow blocks.

was focused on transportation. Lin’s team met with a UPS employee to discuss solutions for preventing package damage. The students learned that most package damage happens during sorting (which occurs on conveyor belts and often causes items to collide), rather than during delivery. The team decided that redesigning the packaging might be a good solution; compactable or adjustable boxes might sustain less damage.

years in a row, which is FIRST’s highest individual leadership award.

FIRST also emphasizes real-world problems through its yearly themes. Students are asked to complete a research project and accompanying device, in addition to their robot. The 2022 theme, “Superpowered,” asks students to explore energy sources and how we can use energy more efficiently in the future.

Last year’s theme, “FIRST FORWARD,”

For another year, Lin’s team devised a tool (dubbed the “trash talker”) that scans the barcodes on consumer products and flashes red or green to tell you whether the item is recyclable. This invention could prevent people from accidentally putting trash into recycling bins, which decreases the value of recycled materials.

“This is the result when you let kids think for themselves,” Lin said proudly.

For more information on FIRST, visit <https://www.firstinspires.org/>.



Almond Robotics shows off their awards at the end of the competition.

PHOTOS: COURTESY DAWEI LIN



Researchers from around the globe convened in Abuja, Nigeria for the 19th H3Africa Consortium Meeting.

PHOTO: COURTESY BONNIE JOUBERT/NIHES

10-YEAR MILESTONE

NIHES Helps Sow Seeds for African Gene-Environment Research

BY JOHN YEWELL

Human Heredity and Health in Africa (H3Africa) recently met in Abuja, Nigeria, concluding a 10-year NIH Common Fund effort to spur a continent-wide genomic research collaboration.

A joint project of NIH, the Wellcome Trust and the African Academy of Sciences, H3Africa facilitates collection of data on African genetic and biological variants previously unrepresented in studies on the hereditary and environmental contributors to human health and disease.

“We are marking a 10-year milestone,” said Dr. Jennifer Troyer, H3Africa program director from NHGRI’s Division of Genome Sciences.

Environmental Factors in Africa

“During the first 5 years, they had to establish a genomic infrastructure before environmental health work could begin,” said Dr. Kimberly McAllister, health scientist administrator (program director) in NIEHS’s Genes, Environment and Health Branch.



Dr. Bonnie Joubert with Dr. Musa Kana, a recent NIH African Postdoctoral Training Initiative fellow at NIEHS who is now based at Kaduna State University in Nigeria. He presented his work on childhood stunting in Nigeria to the H3Africa environmental health working group.

PHOTO: COURTESY BONNIE JOUBERT/NIHES

McAllister, along with Dr. Bonnie Joubert, a program director in the NIEHS Population Health Branch, enabled the environmental health working group and developed workshops at past H3Africa meetings.

They encourage investigators to take the environment into account when trying to determine disease susceptibility. “There

were quite a few population studies where there was potential to add environmental risk factors to their genomic studies,” McAllister said.

“The increased capacity for genomics research in Africa, with leadership from African scientists, has been a huge accomplishment,” Joubert added.

“They can now investigate a deeper characterization of disease susceptibility by accounting for the impacts of both environmental and genetic risk factors. There are research paths available now that may not have been available 5 years ago—definitely not 10 years ago.”

Capacity-Building Research

One in six people alive today lives in Africa, yet Africans have largely been left out of genomic health-related studies. Today, H3Africa has some 500 members and 445 trainees involved in 51 projects, including research sites in more than 30 African countries. More than 100,000 participants have been recruited for studies.

The H3Africa Biorepository (I-HAB) supports research capacity-building through three regional biorepositories located in Nigeria, Uganda and South Africa. Currently, the facility in Uganda is acquiring equipment and training to run environmental laboratory analyses to measure chemicals in biological and environmental samples—analyses that have historically been conducted in the U.S. or Western European laboratories. This information can be used to determine how environmental exposures affect health.

“All three biorepositories store biological and environmental samples,” Joubert explained. “And as planned from the beginning, researchers outside of H3Africa can now submit requests to utilize these samples to test new hypotheses. In Uganda, the biorepository has expanded current laboratory capacity to run exposure analyses without relying on international partners, a huge advancement that will enable even more African-based and African-led research.”



Dr. Kimberly McAllister (l) and Joubert were instrumental in integrating genomics and environmental research in Africa.

PHOTOS: STEVE MCCAW/NIHES

Working group members recently visited the Institute of Human Virology, Nigeria (IHVN), and toured I-HAB, directed by Dr. Alash’le Abimiku.

A presentation by McAllister and Joubert in Abuja summarized the environmental health working group’s accomplishments, while looking to the future.

Highlights included an overview of the working group’s original goals to increase awareness of environmental health and integrate the environment with genomics research in Africa, enable collaboration and knowledge sharing and explore funding opportunities.




Working group members toured I-HAB. Shown are (from l) McAllister; Dr. Sudha Srinivasan of NIAID; Stacey Chambers of NINDS; and IHVN’s Petronilla Nwadike and Dr. Alash’le Abimiku.

PHOTO: BONNIE JOUBERT/NIHES

NIEHS also hosted several webinars focused on environmental health in Africa with guest speakers from around the world.

“Opportunities are still expanding,” said Joubert. “We are at a pivot point where projects can now include more environmental data in their genomics projects or consider ancillary work focusing on environmental health research. They have a strong foundation from which to build.”

“There was a lot of emphasis on the sustainability of the African scientists and their projects,” McAllister added. “We have worked hard to keep up their momentum and inform them of potential funding opportunities. We are hoping a whole bunch of little seeds have been planted.” 

Renovation

CONTINUED FROM PAGE 1

Suresh Ambudkar and NIDCR's Dr. Indu Ambudkar received a surprise deck and home office renovation from their son, actor Utkarsh Ambudkar. Utkarsh currently stars in *Ghosts*, a CBS sitcom about a young couple who inherit an old—and unbeknownst to them—haunted house.

"It was a proud moment for us because Utkarsh was recognized as a celebrity," said Suresh. "The show did the renovation because of him and his success. It's a recognition of his hard work."

The episode followed Utkarsh and construction contractors as they renovated his parents' house. He also visited friends in the area and stopped by his alma mater, Wootton High School in Rockville, Md.

The Ambudkars agreed to be on the show so a wider audience could see where their son grew up and learn more about who he is.

"We also wanted to see how his world works behind the scenes as an actor and how a show gets produced," Suresh said. "We don't know much about it, except that he acts and we sometimes visit his sets."

Filming took place over a few days in spring 2022. At first, production looked "chaotic," Indu said. Crew members flew in from all over the country to take part. Before they began filming, they all met. Then, the crew did their own jobs with little fanfare. They communicated with each other using walkie-talkies. Local contractors renovated the deck.

"The experience really showed teamwork," said Suresh. "Even though they came from different cities, they all knew their role."

The experience was completely different compared to what the researchers are used to. Indu is a senior investigator in NIDCR's secretary physiology section. Her lab studies calcium signaling mechanisms in the context of salivary gland and saliva secretion. Suresh is deputy chief of NCI's Laboratory of Cell Biology. His

lab develops new therapeutic strategies to improve the efficiency of chemotherapy for cancer patients.

"As scientists, we have a conservative way we live and work," said Indu. "Being on the show was beyond the norm, that, you know, suddenly somebody comes and builds you a whole deck!"

On the day of the reveal, they were excited. The Ambudkars knew they were getting a deck, but the final design was a surprise until the reveal. Their grandchildren attended the unveiling.

"The renovation was beautiful. They did an amazing job with the covered portion of the deck," Indu said. "The show gave us all the furniture. I thought they were staging it, but they gave it to us. It's coordinated and nicely done."

The night the show ran, they invited a few close friends over. Their friends had known Utkarsh growing up and attended many of his

performances over the years. The experience was like going down memory lane.

"They thought it was wonderful Utkarsh did all of this," Indu said.

The Ambudkars are getting used to having a famous son and enjoying a bit of celebrity themselves. Recently, Indu had a hair salon appointment. Another patron recognized her for being on the episode.

Getting the renovation from their son was something they never expected.

"We did what any other parent would've done—educate your children and allow them

to do things they like to do," Suresh said. "You don't really expect anybody to pay you back."

Nevertheless, "a new deck was very nice to get," Indu said.

The *Secret Celebrity Renovation* episode featuring the Ambudkars can be seen at https://www.cbs.com/shows/video/2g8sGfn-Jkv6N5NTqBbPcWMzha_BY_B23/.



Actor Utkarsh Ambudkar



The Ambudkar family—Utkarsh (c) with dad Suresh (l), mom Indu, wife Naomi and children Tiare and Bhumi—enjoys the new deck at their home.

Bronchodilators Don't Relieve Smoking-Related Symptoms in People Without COPD

NIH researchers have found that dual bronchodilators—long-lasting inhalers that relax the airways and make it easier to breathe—do little to help people who have respiratory symptoms related to smoking but who do not have chronic obstructive pulmonary disease (COPD).



PHOTO: ORAWAN PATTARAWIMONCHAI/SHUTTERSTOCK

COPD, a lung disease that obstructs the airways and leads to coughing, wheezing and shortness of breath affects about 15 million Americans. However, millions of others who smoke or used to smoke and have some symptoms of COPD have also been prescribed bronchodilators.

“We’ve assumed these medications worked in patients who don’t meet lung function criteria for COPD, but we never checked,” said principal investigator Dr. MeiLan Han, first author of the study. “We now know these existing medications don’t work for these patients.”

Findings of this NHLBI-funded study, published in the *New England Journal of Medicine*, underscore the importance of diagnosing lung conditions through spirometry, a lung function test often underutilized in clinical practice.

Inhalers have long been the primary go-to treatment for these patients. But while smoking causes a large spectrum of lung damage, the study showed bronchodilator therapy only helps patients with enough lung damage that would result in abnormal spirometry readings.

In the 12-week randomized, double-blinded study—part of the Redefining Therapy in Early COPD for the Pulmonary Trials Cooperative—researchers enrolled 535 adults with symptoms of COPD, ages 40-80, at one of 20 U.S. medical centers. Twice daily, study participants used an inhaler that contained either medication or a placebo.

By the end of the trial, some adults in the medication (intervention) and placebo (control) groups saw slight respiratory improvements. However, researchers found no significant differences between those receiving medication or placebo.

Doctors can help patients who do not meet lung-function criteria of COPD by working with them to address related underlying health issues.

“In the meantime,” said Han, “research should be focused on finding new treatments for them.”

Stimulation Improves Memory in Older Adults

A noninvasive stimulation technique targeting specific brain regions resulted in month-long memory improvements in seniors who participated in a recent study. Results were reported in *Nature Neuroscience*.

Based on earlier research, an NIH-funded research team at Boston University hypothesized that low-frequency stimulation to the parietal region near the back of the brain would improve short-term working memory, whereas high-frequency stimulation to the prefrontal cortex would improve long-term memory.

The team enrolled 150 volunteers, ages 65-88, in a randomized, double-blinded clinical trial and used a technique called high-definition transcranial alternating current stimulation (HD-tACS). The method involves applying weak electrical currents of different frequencies to specific brain regions to help modify and synchronize the brain’s rhythmic activities.

Participants received 20 minutes of stimulation for 3 or 4 consecutive days. At the start of each session, they donned an electrode-studded skull cap that delivered currents to specific brain regions. The control group received two 30-second pulses of stimulation that generated tingling sensations to mimic those felt in the active treatment groups.

To assess memory during the treatment sessions, researchers read aloud 5 lists of 20 common words. At the end of each list, participants were asked to recall as many words as possible. More recently heard words at the end of the lists involved working memory. Words recalled near the beginning of the list needed to use long-term memory. Memory was also assessed at baseline (before treatments began) and 30 days later.

Participants who received low-frequency stimulation to the back of the brain had improved working memory on the third and fourth days of treatment as well as one month later. Those receiving high-frequency stimulation to the same brain region showed no such improvement.

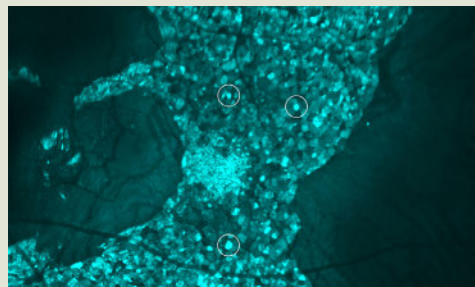
In contrast, volunteers given high-frequency, but not low-frequency, stimulation to the front of the brain showed improved long-term memory on the second through fourth days of treatment and one month later.

Participants who began the study with poorer cognitive function had greater and more enduring improvements. The findings suggest that the activity and functioning of the aging brain can be sustainably altered and improved by using noninvasive techniques to modify specific brain rhythms. Further study is needed to determine whether such methods can enhance memory function in people with brain disorders and in those at risk for dementia.—adapted from *NIH Research Matters*

Novel Imaging Approach Reveals Details About Rare Eye Disease

NEI intramural researchers have shown for the first time how cells across different tissue layers in the eye are affected in people with choroideremia, a rare genetic disorder that leads to blindness. The study—which combined traditional eye imaging techniques with adaptive optics, a technology that enhances imaging resolution—was published in *Communications Biology*.

Dr. Johnny Tam, head of the NEI clinical and translational imaging unit, combined adaptive optics with indocyanine green dye to view live cells in the retina, including light-sensing photoreceptors, retinal pigment epithelium (RPE) and choroidal blood vessels. His team was able to



RPE cells (circled) in a male participant with choroideremia

IMAGE: JOHNNY TAM/NEI

see in detail the extent to which choroideremia disrupts these tissues, providing information that could help design effective treatments for this and other eye diseases.

Choroideremia affects men more than women because the gene responsible for the disease is located on the X chromosome. Since males have only one copy of the X chromosome, a mutation in the gene causes males to develop more severe symptoms, while females—who have two copies of the X chromosome—usually have milder symptoms, having one working copy of the gene on the other X chromosome.

“One major finding of our study was that the RPE cells are dramatically enlarged in males and females with choroideremia,” said Tam. “We were surprised to see many cells enlarged by as much as five-fold.”

Tam’s adaptive optics is not part of routine diagnostic testing in eye clinics. Surprisingly, his team found that enlarged RPE cells can be detected even when using only a commercially available scanning laser ophthalmoscope along with indocyanine green dye.

“It’s not obvious at first, but using an existing tool in the clinic, we can monitor and track the cellular status of the RPE layer,” said Tam. “This could prove valuable in identifying which patients would benefit the most from therapeutic interventions.”

NEXT-GENERATION MENTOR

NEI's Preston Teaches, Inspires Young Scientists

BY DUSTIN HAYS

Kiam Preston has yet to write his dissertation, but he's already mentoring the next generation of scientists.

A graduate student at the National Eye Institute, Preston volunteered this summer as a virtual instructor in the 8-week-long *Journal of Emerging Investigators* Mini Ph.D. Program.

The program targets rising 8th to 10th grade students from ethnic groups underrepresented in science (Black/African American, Hispanic/Latino, American Indian/Alaska Native, and Pacific Islander). *JEI's* mission is to foster youth interest in science by enabling young scientists to publish in a peer-reviewed journal.

In addition to attending lectures over the summer, program participants conduct research, draft manuscripts and publish their results in *JEI*.

Preston gave Saturday lectures on various topics, including bacteria, the research process and the structure of research papers. Together, he and his students designed an experiment to test the antibacterial properties of common household items, including vinegar, lime juice and hot sauce, using at-home lab kits.

"The best part so far has been troubleshooting the experiment with my students," said Preston. "We've enjoyed generating ideas, thinking critically and converting our thoughts into something tangible. Our experiment has concluded and now we're drafting our manuscript. At the program's end, the students submit their manuscript to *JEI* for peer review by other budding scientists"

Although his future in science is uncertain, Preston believes teaching and mentoring will be an important part of his work, wherever life's road takes him.

For now, he devotes most of his energy to earning a Ph.D. in biomedical science at Morehouse School of Medicine. With mentor Anand Swaroop, chief of the NEI Neurobiology Neurodegeneration and Repair Laboratory, Preston is studying rod photoreceptor development and its involvement in circadian rhythms.

To watch a short video of Preston explaining his *JEI* mentorship, visit https://www.youtube.com/watch?v=Lioe_UMtco.



Kiam Preston

Preston demonstrates his work in the lab and discusses his *JEI* mentorship in a video.**Lozano of MD Anderson To Deliver Pittman Lecture, Dec. 7**

Dr. Gigi Lozano of University of Texas MD Anderson Cancer Center will deliver the Margaret Pittman Lecture, part of the Wednesday Afternoon Lecture Series, on Dec. 7 from 2 to 3 p.m. ET in Lipsett Amphitheater, Bldg. 10 and at <https://videocast.nih.gov/watch=46003>. The talk is titled "Mutant p53 Activities in Mouse Tumor Models."



Dr. Gigi Lozano

Lozano is the Hubert L. Olive Stringer distinguished chair in oncology in honor of Sue Gribble Stringer at MD Anderson. A renowned geneticist, she is recognized for her studies of the p53 tumor suppressor pathway, which is undermined in a large percent of human cancers via mutations and deletions of p53.

Pittman was the first female laboratory chief at NIH and the annual lecture is delivered by a speaker who has exemplified her intelligence, scientific excellence and drive. Up to 50 people may attend in person. If you are interested, email WALSoffice@od.nih.gov. For more information about WALs, visit <https://oir.nih.gov/wals>.

Robinson Returns to NIH as NIDCD's First Chief Diversity Officer

Dr. Cendrine Robinson has been selected as NIDCD's first chief diversity officer. She joins NIDCD from the Department of Veterans Affairs, where she served as a scientific program officer and diversity, equity and inclusion (DEI) chair.

Robinson is an expert in leading programs to promote diversity in research. At the VA, she led the development of a DEI strategy for the Office of Research

and Development, executing initiatives to promote health equity and to expand the pipeline of investigators from historically excluded groups. She also co-directed implementation of summer research programs at 21 VA medical centers.

In addition, Robinson has extensive experience in project management and biomedical behavioral research. She was a research fellow and project manager for the Smokefree.gov initiative at NCI. There, she conducted multiple research projects aimed at improving smoking cessation outcomes for adolescents and African-American smokers by focusing on access and engagement.

Robinson initiated collection of race and ethnicity data for NCI's Smokefreetxt—a text-messaging service for people who are ready to quit smoking—and conducted the first analysis of Smokefreetxt outcomes among African-American smokers.

Besides guiding research, she also served as a project officer tasked with planning, advising and evaluating program activities to support a research portfolio.

Robinson received a bachelor's degree in brain and cognitive sciences from the University of Rochester. She earned master's and doctoral degrees in medical and clinical



Dr. Cendrine Robinson is NIDCD's first chief diversity officer.

psychology from the Uniformed Services University of the Health Sciences as well as a master's degree in public health-quantitative methods from Harvard School of Public Health.

Robinson was a psychology resident and research fellow at the Edward Hines Jr. VA Hospital in Hines, Ill., and has served as health equity ambassador for the American Psychological Association and in leadership roles for the Society for Research on Nicotine and Tobacco.

NICHD Remembers Former Senior Investigator Nisula

BY LINDA HUYNH

Dr. Bruce Nisula, a longtime member of the intramural community who began his NIH career in 1971, died Aug. 30, after a long battle with cancer. He was a founding member of the former NICHD Developmental Endocrinology Branch (DEB), which he led from 1988 until his retirement in 1995.

Nisula graduated from Dartmouth College in 1966 and earned his medical degree from Harvard Medical School in 1969.

After completing his internship at Peter



Dr. Bruce Nisula



Morning rounds at the NIH Clinical Center in the 1970s included (from l) Drs. Gordon Cutler, Barton Haynes, Lynn Loriaux, Nisula and Griff Ross.

Brent Brigham Hospital and his residency at Children's Hospital Center, he joined the Public Health Service. Nisula first served as a clinical associate in the Reproductive Research Branch at NICHD. In 1976, he helped create the DEB, where he continued his clinical research program until 1995.

Nisula earned an international reputation as an authority on the structure and function of glycoprotein hormones, especially human chorionic gonadotropin (hCG) and thyroid-stimulating

hormone (TSH).

As a postdoctoral fellow at NICHD, he established that the hyperthyroidism often seen in patients with choriocarcinoma is caused by hCG, which is secreted in excessive amounts.

As a senior investigator and later as chief of the section on medical endocrinology within DEB, Nisula developed methods to quantify hCG-related molecules and to distin-

guish them from hCG. One such metabolite, the so-called "beta-core fragment," is particularly important because it is a marker for non-trophoblastic cancers of the reproductive system. From there, he developed an assay to detect these types of reproductive cancer in women, and the test was patented in 1995.

Nisula's work on hCG also led to the discovery that a higher than expected percentage of pregnancies are lost close to the time of implantation, long before women realize they are pregnant. His research also showed that hCG levels contribute to fertility, which was contrary to the thinking at the time.

Nisula is also known for his contributions to the diagnosis and management of thyroid disorders, especially for developing assays for



Members of NICHD's Developmental Endocrinology Branch pause for a group shot. Shown are (standing from l) Dr. George Chrousos, Dr. George Merriam, Cutler and Nisula. Seated are (from l) Dr. Greti Aguilera, Dr. Carolyn Bondy and Dr. Fernando Cassorla.

TSH. His studies on TSH have simplified the clinical diagnosis of children with central hypothyroidism—a malfunction of the pituitary gland that is often difficult to detect—as well as the diagnosis of borderline hyper- and hypothyroidism in children.

He authored or co-authored more than 130 publications. **R**

VOLUNTEERS

SCD Study Seeks Participants

Do you or someone you know have sickle cell disease (SCD)? Researchers at the Clinical Center are conducting a study to evaluate blood clotting in people with SCD and SCD trait. The study needs healthy African-American volunteers. There is no cost for participation and compensation is provided. Contact the Office of Patient Recruitment at (866) 444-2214 (TTY users dial 711) or ccopr@nih.gov. Refer to study #20-H-0068. Read more online at <https://go.usa.gov/xfvab>.

Universal Flu Vaccine Study Wants Healthy Volunteers

NIAID researchers seek healthy volunteers 18 to 50 years old to participate in a universal influenza (flu) vaccine study. Scientists are testing an investigational flu vaccine (Flu-Mos v1) to determine safety and tolerability. There is no risk of infection from participation, as the investigational product does not contain any flu virus. Financial compensation is provided. Contact the Office of Patient Recruitment at (866) 444-2214 (TTY users dial 711) or ccopr@nih.gov. Refer to study #000410-I. Online: <https://bit.ly/3QflqWf>.

FOIL THE FLU UNDERWAY

Free Influenza Immunizations for Staff End Nov. 4

Foil the Flu, the annual seasonal influenza immunization program for NIH staff, has begun and will end on Friday, Nov. 4.

The vaccine will be given by appointment only through an online registration system. Walk-in immunization will not be available.

All staff with a valid NIH identification badge are eligible to receive flu vaccine for free and are encouraged to be immunized against the flu. The best way to reduce the risk of getting the flu is to get the flu vaccine every year. All staff who have patient contact, including both employees and contractors, are required to get immunized each year.

The on-campus location has returned to the Bldg. 10, CRC 7th fl. atrium, east side.


There will be additional Covid-19 safety measures in place. Staff providing vaccines will be carefully following infection-control procedures. Staff arriving for a flu shot must wear a face mask and follow all physical-distancing requirements. A mask will be provided if you do not have one.

2022-2023 Immunization Schedule and Registration

View the immunization 2022 schedule, including off-campus dates for Shady Grove, Bayview, Poolesville, Harbor Hospital, Fisher's Lane and Rockledge locations.

Register for an appointment at <https://clinweb.cc.nih.gov/CCT>. You must be on the NIH network, or logged onto VPN, to access. If you are unable to access the registration website, call the Occupational Medical Service at (301) 496-4411 or email OMSfluclinic@mail.nih.gov.

All teleworking employees in the Washington, DC area are encouraged to schedule an appointment at our Shady Grove, Fisher's Lane, or Rockledge locations. Do not schedule an appointment at Baltimore/Harbor Hospital or Poolesville unless you work onsite at those locations.

Visit <https://ors.od.nih.gov/flu/Pages/default.aspx> for more details. 

Foil the Flu: 2022 Immunization Schedule

NIH photo ID and appointment required

** Harbor Hospital, BRC, and Poolesville locations are limited to onsite staff. The Fishers Lane, Rockledge and Shady Grove locations are recommended for personnel working remotely. **				
Date	Day	Location	Morning	Afternoon/Evening
09/26/2022	Monday	Bldg. 10	8:00 – Noon	Noon – 3:30
09/27/2022	Tuesday	Bldg. 10	8:00 – Noon	Noon – 3:30
09/28/2022	Wednesday	Bldg. 10	8:00 – Noon	Noon – 3:30
09/29/2022	Thursday	Bldg. 10	6:00 – Noon	Noon – 7:00
09/30/2022	Friday	Bldg. 10	8:00 – Noon	Noon – 3:30
10/03/2022	Monday	Bldg. 10	8:30 – Noon	Noon – 3:30
10/04/2022	Tuesday	Bldg. 10	8:30 – Noon	Noon – 3:30
10/05/2022	Wednesday	Bldg. 10	8:30 – Noon	Noon – 3:30
10/06/2022	Thursday	Bldg. 10	8:30 – Noon	Noon – 3:30
10/07/2022	Friday	Bldg. 10	8:30 – Noon	Noon – 3:30
10/10/2022	Monday	Closed - Holiday		
10/11/2022	Tuesday	Fishers Lane	9:00 – Noon	Noon – 3:00
10/11/2022	Tuesday	Poolesville	9:00 – 11:30	
10/12/2022	Wednesday	Fishers Lane	9:00 – Noon	Noon – 3:00
10/13/2022	Thursday	BRC	9:00 – Noon	Noon – 3:00
10/14/2022	Friday	BRC	9:00 – Noon	Noon – 3:00
10/14/2022	Friday	Harbor Hospital		1:00 – 2:30
10/17/2022	Monday	Shady Grove	9:00 – Noon	Noon – 3:00
10/18/2022	Tuesday	Shady Grove	9:00 – Noon	Noon – 3:00
10/19/2022	Wednesday	Shady Grove	9:00 – Noon	Noon – 3:00
10/20/2022	Thursday	Shady Grove	9:00 – Noon	Noon – 3:00
10/21/2022	Friday	Bldg. 10	8:30 – Noon	Noon – 3:30
10/22/2022	Saturday	Bldg. 10	6:30 – 8:00	6:30 – 8:00
10/24/2022	Monday	Bldg. 10	8:30 – 11:30	12:30 – 3:30
10/25/2022	Tuesday	Bldg. 10	8:30 – 11:30	12:30 – 3:30
10/26/2022	Wednesday	Bldg. 10	8:30 – 11:30	12:30 – 3:30
10/27/2022	Thursday	Rockledge	9:00 – Noon	Noon – 3:00
10/28/2022	Friday	Rockledge	9:00 – Noon	Noon – 3:00
10/31/2022	Monday	Bldg. 10	8:30 – 11:30	12:30 – 3:30
11/01/2022	Tuesday	Bldg. 10	8:30 – 11:30	12:30 – 3:30
11/02/2022	Wednesday	Bldg. 10	8:30 – 11:30	12:30 – 3:30
11/03/2022	Thursday	Bldg. 10	8:30 – 11:30	12:30 – 3:30
11/04/2022	Friday	Bldg. 10	8:30 – 11:30	12:30 – 3:30

Locations

- **Main Campus:** Bldg. 10 7th fl. atrium
- **Fishers Lane:** 5601 Fishers Ln. Rockville, MD 20852, Conf. Rm. TBD
- **Poolesville:** 16701 Elmer School Rd, Dickerson, MD 20842, Bldg. 103 (room to be announced on clinic day)
- **Biomedical Research Center-Bayview:** 251 Bayview Blvd., Baltimore, MD 21224, 3rd fl. atrium lobby
- **Harbor Hospital:** 3001 S. Hanover St, Baltimore, MD 21225, 5th fl. (room to be announced on clinic day)
- **Shady Grove:** 9609 Medical Center Drive, Rockville, MD 20850, Seminar Rm. 110
- **Rockledge:** 6700B Rockledge Drive, Bethesda, MD 20817, Suite 1100