

NIH RECORD

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National Institutes of Health

NCI's Frederick Campus Hosts HHS Secretary, Members of Congress

A congressional delegation representing Maryland joined HHS Secretary Xavier Becerra and other department officials on July 22 for a visit to NCI's campus in Frederick, Md.

Dr. Lawrence Tabak, performing the duties of NIH director, and NCI acting director Dr. Doug Lowy greeted U.S. Sen. Ben Cardin, U.S. Sen. Chris Van Hollen, U.S. Rep. David Trone, Becerra and HHS Region 3 director Dr. Ala Stanford.

The group took part in a roundtable discussion about research at NCI Frederick, along with its support of the

SEE **FREDERICK**, PAGE 6



HHS Secretary Xavier Becerra (2nd from l) and a congressional delegation representing Maryland visit a lab on NCI's Frederick campus.

PHOTO: CHIA-CHI CHARLIE CHANG



NEI rewards teen videographers. See story, p. 12.

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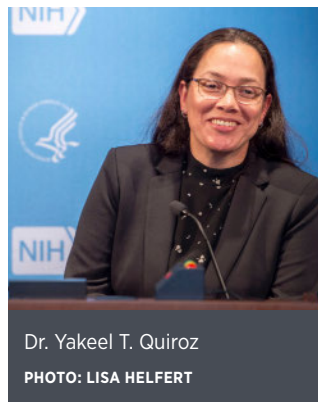
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UNIQUE POPULATION COLBOS Study Reveals Mysteries of Alzheimer's

BY ERIC BOCK

A Colombian family with a rare mutation for early-onset Alzheimer's Disease has provided researchers a unique opportunity to study the disease years before symptoms begin, said Dr. Yakeel T. Quiroz, during the recent Florence Mahoney Lecture on Aging, part of the Wednesday Afternoon Lecture Series.

By identifying the preclinical stages of



Dr. Yakeel T. Quiroz

PHOTO: LISA HELFERT

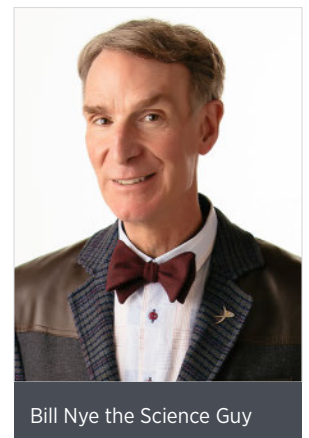
SEE **QUIROZ**, PAGE 4

SCIENCE GUY Nye Talks Sustainability

BY AMBER SNYDER

Beloved science educator "Bill Nye the Science Guy" took the virtual stage earlier this year to educate federal employees and their children. His presentation, "Protecting the Planet Wherever You Are" was the second installment in the Sustainability Speaker Series for the federal community.

A mechanical engineer by schooling, Nye is best known for his accomplishments as



Bill Nye the Science Guy

SEE **NYE**, PAGE 8

ORWH Seeks Input on Strategic Plan

NIH's Office of Research on Women's Health has published a request for information (RFI), NOT-OD-22-186, to solicit input from stakeholders across the scientific research, advocacy and patient communities, as well as the public, to inform the topics that will be included in the forthcoming NIH-Wide Strategic Plan for Research on the Health of Women.

ORWH plans to include information on recent public health events (e.g., the Covid-19 pandemic) that have had a significant impact on the health of women. Several topics were reviewed by NIH and the advisory committee on research on women's health (ACRWH), through the congressionally directed and ORWH-led "Advancing NIH Research on the Health of Women: A 2021 Conference." ACRWH recommendations as well as recent scientific advances, current health priorities and feedback from the RFI will be considered in the development of the Strategic Plan.

Input on the plan will be accepted through Thursday, Sept. 29. All responses must be submitted electronically at <https://bit.ly/3QlchwE>. Send questions to NIHWideSPWH@nih.gov.

Wiemken To Offer Primer on Machine Learning in Epidemiology

Join the Office of Disease Prevention on Wednesday, Aug. 31 at noon ET for a Methods: Mind the Gap webinar on machine learning methods in epidemiology with Dr. Timothy Wiemken.

Machine learning has become a hot topic in many areas of research and may have utility for answering many novel questions in epidemiology. The purpose of this webinar is to provide an overview of the salient concepts surrounding supervised machine learning methods and their application to epidemiologic problems.

Wiemken is senior director of clinical epidemiology for the Pfizer mRNA vaccine platform.

His work focuses on data-driven approaches to solve pressing clinical public health issues.

Prior to joining Pfizer, he was associate professor of mMedicine in the St. Louis University School of Medicine, department of internal medicine, Division of Infectious Diseases, and director of infectious diseases epidemiology at SSM Health, St. Louis University Hospital.



Pfizer's Dr. Timothy Wiemken will offer a primer on machine learning in epidemiology.

Prize Winners Announced of Maternal Health Diagnostics Challenge

NIH selected winners of its Technology Accelerator Challenge for Maternal Health, a competition for developers of diagnostics to help improve maternal health worldwide.

Globally, more than 800 women and 7,000 newborns die every day from complications related to pregnancy and childbirth. Low-cost diagnostics that operate at point-of-care and can detect and differentiate among common conditions associated with pregnancy are needed to help reduce the high rates of maternal morbidity and mortality in low-resource settings.

The winning technologies share a total of \$1 million in prizes for successful design and development of diagnostic tests and platform technologies that will reduce maternal morbidity and mortality.

The competition is managed by NIBIB, in partnership with the Bill & Melinda Gates Foundation, and with support from NICHD and NIH's Office of Research on Women's Health.

Five winners were chosen out of more than 40 entries. Winners include:



1st place: Dr. Bethany Hedt-Gauthier of Harvard mHealth tools for community health worker-led home-based diagnosis of surgical site infections and anemia post-cesarian delivery

2nd place: University of California, Irvine
A low-cost, portable maternal obstetrics sock to monitor pregnant women for preeclampsia, anemia and hemorrhage

Tied for 3rd place: Softsonics, LLC, San Diego
A wearable ultrasound sensor to monitor pregnancy complications

Raydiant Oximetry, Inc. San Francisco.
A non-invasive platform technology to diagnose maternal hemorrhage and fetal distress during pregnancy

For more information about the competition and winners, see: <http://ow.ly/Tyny50K1uJh>.

Registration for the webinar is required. Register at prevention.nih.gov/education-training/methods-mind-gap/primer-machine-learning-epidemiology-and-health-outcomes-research. The webinar will be recorded and available on the ODP website within approximately 2 weeks.

The webinar series explores research design, measurement, intervention, data analysis and other methods of interest in prevention science. For more information, visit prevention.nih.gov/MindTheGap.

Register for the 37th Challenge Relay

After a 2-year pandemic induced hiatus, a much-anticipated competition returns! The 37th NIH Institute Challenge Relay will be held on Wednesday, Sept. 21 in front of Bldg. 1, beginning at 11:30 a.m.

The relay consists of teams of five runners, each of whom runs a half-mile loop around Bldg. 1. All institutes, centers, divisions and contractors are invited to enter as many teams as they wish. Each team must have at least 2 women runners and at least 2 men runners.

In years past, clever team names and humorous costumes have added to the fun of the competition.

To register for this R&W event, visit: <https://>



On Your Mark, Get Set...Go! It's time to plan for the 37th NIH Institute Challenge Relay. Can your team defeat the two-time defending champs "Worktime's Over" (shown in 2019)?

PHOTO: MARLEEN VAN DEN NESTE

govemployee.com/nih/event-detail/37th-nih-institute-relay/. The fee is \$20 per team.

Each group leader is asked to provide the name and contact information for one volunteer; 26 volunteers for each of two heats are needed.

Food vendors and event exhibitors will be on site as well. To volunteer or for more information, email David Browne at browned2@mail.nih.gov.



Dr. Paul Cotton

Cotton Is New Director of NIMHD Extramural Research

Dr. Paul Cotton recently began serving as the new director of the Office of Extramural Research Activities (OERA) at the National Institute on Minority Health and Health Disparities.

In this role, he advises on and manages science policy and program activities related to extramural administrative management, scientific management and scientific initiatives. He is also responsible for developing and implementing policies for managing research awards, overseeing research training policies, and supporting diversity, equity and inclusion research initiatives.

With a 22-year history of working for the federal government, Cotton joins the NIMHD family with a strong background in leadership and health disparities science. His federal career started in 2000 as a category 3 scientist in the community nutrition research group in the Beltsville Human Nutrition Research Center at the Department of Agriculture.

He has also served as a program director and team lead at the National Institute of Nursing Research and as assistant division director in the Division of Receipt and Referral at the Center for Scientific Review.

In 2016, he left NIH and joined the National Institute of Food and Agriculture, USDA's research agency, as national program leader for public health nutrition. He served as a director in the nutrition division at the Institute of Food Safety and Nutrition. He led in applying science-based knowledge to solving complex problems in the food and agricultural sciences.

Cotton returned to NIH in May 2020, most recently as lead program officer for DECIPHeR in the Health Inequities and Global Health Branch in NHLBI's Center for Translation Research and Implementation Science.

Cotton graduated from Howard University, where he earned a bachelor's, master's and doctoral degree in nutritional sciences. He also served as a faculty member and head wrestling coach.

Trial Opens for Potential Universal Flu Vaccine

NIH investigators have begun testing a universal influenza vaccine designed to protect against a wide range of seasonal flu viruses and those with pandemic potential. A phase 1 clinical trial of this novel flu vaccine has begun inoculating healthy adult volunteers at the Clinical Center.

The placebo-controlled trial will test the safety of a candidate vaccine, BPL-1357, and its ability to prompt immune responses. The vaccine candidate was developed by NIAID researchers. The single-site trial, led by NIAID investigator Dr. Matthew Memoli, can enroll up to 100 people ages 18 to 55 years.

The BPL-1357 candidate influenza vaccine performed well in preclinical studies and now



Dr. Matthew Memoli

will be tested in people. BPL-1357 is a whole-virus vaccine made up of four strains of non-infectious, chemically inactivated, low-pathogenicity avian flu virus.

A study in animals led by NIAID investigator Dr. Jeffery Taubenberger found that all mice receiving 2 doses of BPL-1357 vaccine delivered either intramuscularly

or intranasally survived later exposure to lethal doses of each of 6 different influenza virus strains, including subtypes that were not included in the vaccine. Similar results were obtained in challenge experiments with BPL-1357-vaccinated ferrets.

In the phase 1 trial, volunteers will be randomized in a 1:1:1 ratio into 3 groups and will receive 2 doses of placebo or vaccine spaced 28 days apart.

Group A participants receive BPL-1357 intramuscularly along with intranasal saline placebo; group B will receive doses of the candidate vaccine intranasally along with intramuscular placebo; volunteers in group C receive intramuscularly and intranasally delivered placebo at both visits to the clinic. Neither the study clinicians nor the volunteers know the group assignments.

"With the BPL-1357 vaccine, especially when given intranasally, we are attempting to induce a comprehensive immune response that closely mimics immunity gained following a natural influenza infection," said Memoli. "This is very different than nearly all other vaccines for influenza or other respiratory viruses, which focus on inducing immunity to a single viral antigen

and often do not induce mucosal immunity.

"Our study will examine the safety of BPL-1357," he added, "and also will allow us to assess the importance of mucosal immunity against flu and whether a strategy of inducing both the cellular and antibody arms of the immune system can provide broader protection against the ever-changing influenza virus." **R**



Dr. Jeffery Taubenberger



ON THE COVER: *Human Papillomavirus (HPV) in head and neck cancer. A schematic cross-section of the head and neck, with a rainbow of colored sticks emanating from a star image in the center of the head and radiating out to various pink and purple colored globes depicting viruses associated with head and neck cancers.*

IMAGE: ERNESTO DEL AGUILA III, NHGRI

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NIA director Dr. Richard Hodes presents Quiroz with a framed memento of her lecture.

PHOTOS: LISA HELFERT

Quiroz

CONTINUED FROM PAGE 1

the disorder, researchers hope to “delay the clinical onset and prevent Alzheimer’s disease and dementia altogether,” said Quiroz, associate professor in the departments of psychiatry and neurology at Massachusetts General Hospital and Harvard Medical School.

As a college student, more than 20 years ago, she began studying together with Prof. Francisco Lopera an extended family group of 6,000 people in Antioquia, Colombia. Many of them carry a rare, genetic mutation for early-onset AD, called the Presenilin-1 (PSEN1) mutation. Carriers develop the disease with almost 100 percent certainty. On average, they experience cognitive impairment at age 45 and dementia at age 50.

Quiroz has followed individuals from these families who are destined to develop AD and dementia decades before they show

symptoms. “We have a window of opportunity to characterize some of the earliest preclinical changes,” she noted.

There are several clinical, cognitive and biomarker similarities between early-onset AD and sporadic late-onset AD, the more common form of the disease. Age, family history and heredity are the most important risk factors for late-onset AD, Quiroz said. Most people diagnosed with late-onset AD are over 65 years of age.

Those with the PSEN1 mutation undergo brain changes years before they begin to exhibit symptoms, she said. In children, boys with the mutation had decreased working memory compared to girls with the mutation. This suggests a “sex-specific genetic risk” in early-life cognitive abilities. Brain abnormalities, such as changes in brain activation and brain volume, begin as young as age 9.

“The increased risk of cognitive abilities in boys may have important implications when we’re thinking about learning and academic achievement,” Quiroz said.

In 2014, Quiroz launched COLBOS (Colombia-Boston), a collaborative, longitudinal biomarker study between the Universidad de Antioquia, Colombia, and Massachusetts General Hospital, Boston. Every 2 years, Colombians from the PSEN1 families travel to the United States, where doctors collect health data and perform advanced neuroimaging examinations.



Quiroz visits the Mahoney memorial located in a northside patio of the Clinical Center. Florence Stephenson Mahoney (1899–2002) devoted much of her life to advocating for creation of the National Institute on Aging.

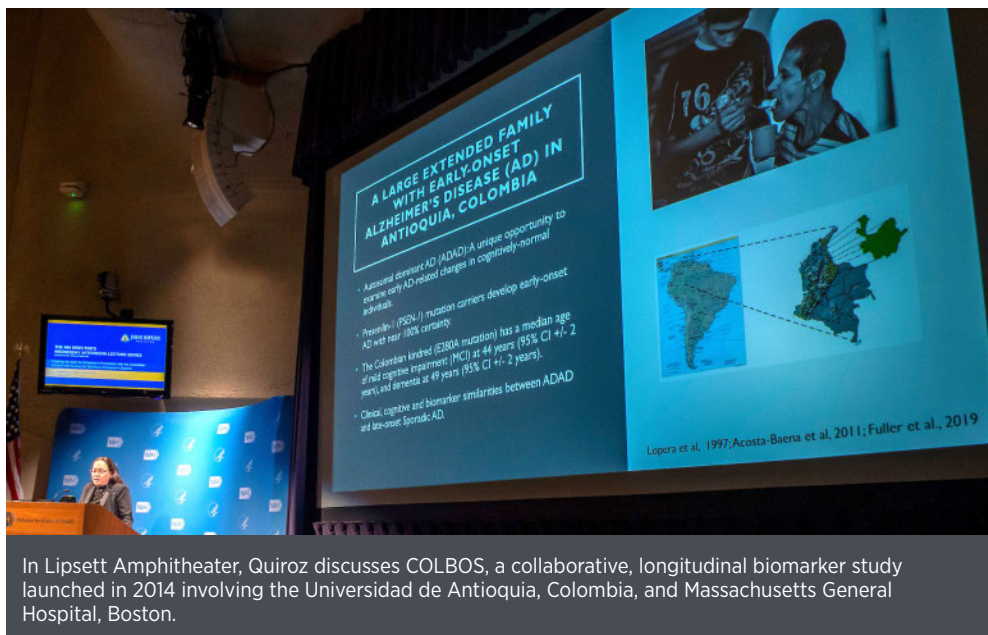
COLBOS has shown that the amyloid protein begins accumulating in carriers around age 28, Quiroz said. The protein clumps together to form plaques that build up between neurons. Amyloid is one of two proteins—the other tau—that accumulate in the brains of patients with AD.

The tau protein starts accumulating in their late 30s, Quiroz explained. This occurs a few years before they exhibit symptoms. Tau forms threads and tangles together, which disrupts brain connectivity. Increased levels of tau only occur in parts of the brain where amyloid was present. It’s linked to memory decline.

“The accumulation of amyloid appears to be a steady process, beginning as early as 20 years before dementia onset,” she explained. “In contrast, tau pathology is very rapid.”

There are two blood biomarkers that might help researchers detect AD before symptoms begin. Carriers of the mutation have a higher concentration of neurofilament light chain (NfL) and ptau217. Both are proteins. These blood biomarkers might allow individuals who don’t have access to tau or amyloid brain imaging an opportunity to get an earlier AD diagnosis, she said.

One woman who participated in the COLBOS study carried the PSEN1 mutation. However, she did not develop AD symptoms until she was in her 70s, almost 30 years after the expected age of onset for other carriers. Quiroz said her brain had high levels of



In Lipsett Amphitheater, Quiroz discusses COLBOS, a collaborative, longitudinal biomarker study launched in 2014 involving the Universidad de Antioquia, Colombia, and Massachusetts General Hospital, Boston.

amyloid and very low levels of tau.


Genetic testing revealed the woman had two copies of the APOE Christchurch mutation, which seems to have protected her brain against tau accumulation. Quiroz's team has developed an antibody that mimics the mutation's function. Researchers are studying the antibody to determine whether

it might be a promising therapeutic.

"Families with autosomal dominant mutations provide a unique opportunity to study disease progression from preclinical to clinical stages, [and] develop and improve measures for early detection, novel interventions and clinical trials," Quiroz concluded.

Mahoney lectures are sponsored by

NIA and named in honor of Florence Stephenson Mahoney (1899–2002), who devoted much of her life to successfully advocating for the creation of NIA and increased support for NIH.

The lecture can be viewed at <https://videocast.nih.gov/summary.asp?live=44272>. 

HBCU-CONNECT

NIEHS Launches New Initiative with Historically Black Colleges, Universities

BY JOHN YEWELL

NIEHS recently unveiled HBCU-Connect, a new initiative to increase collaboration with students and faculty from Historically Black Colleges and Universities (HBCUs).

"NIEHS fosters an inclusive scientific discovery environment by providing educational opportunities for students of all ages and backgrounds," said institute deputy director Dr. Trevor Archer, opening an event introducing the initiative. "Our goal is to inspire the development of environmental health science leaders from diverse backgrounds—in this case, from the HBCU community."

HBCU-Connect is a multifaceted effort to strengthen ties between the institute and faculty and students at academic institutions that are often underrepresented in the sciences.

"The program we're launching today is just the beginning of a larger effort," said Dr. Ericka Reid, director of NIEHS's Office of Science Education and Diversity (OSED), which sponsored the event. "We're starting in the Triangle [Raleigh, Durham and Chapel Hill, North Carolina], but we're also reaching out to HBCUs across the state and the region."

She stressed the importance of mentoring to the success of HBCU-Connect.

"Students will be invited to lab meetings, staff meetings, science talks and other events," Reid said. "NIEHS mentors will assist in any way they can to help you make decisions regarding your educational goals and career path."

Research Training

Dr. Suchandra Bhattacharjee, manager of OSED's Undergraduate Research Training Program,



NIEHS fosters an inclusive scientific discovery environment by providing educational opportunities for students of all backgrounds.

PHOTO: STEVE MCCAUN/NIEHS

chaired a session on opportunities at NIH, including the Summer Internship Program, the Postbaccalaureate Intramural Research Training Award (IRTA) and the Undergraduate Scholarship Program (UGSP). Unique to NIEHS is the Scholars Connect Program.

There are almost 1,300 postbaccalaureate trainees across all 27 institutes and centers.

"UGSP [works with] students from financially disadvantaged backgrounds who make a commitment to health-related research," UGSP director Dr. Darryl Murray said. "Providing NIH jobs is one of our goals."

Katherine Hamilton of the NIEHS Office of Fellows' Career Development emphasized that students do not need experience to be part of the summer program.

"You will work directly with a principal investigator or postdoc," she said. "We will teach you everything you need to know."

Second year NIEHS postbac IRTA fellow Princess Kamuche is now applying for medical school. Her advice is not to be daunted by challenges. "Don't think that because a program is prestigious, you must be underqualified," she said.

Glenn Jackson, a 2020–2021 Scholars Connect participant and recent graduate of North Carolina Agricultural and Technical State University, had similar advice.

"We discussed the imposter syndrome—the fear that you aren't good enough—a lot," he said. "That fear can prevent you from doing things. Give yourself confidence that you know you can do it. No one is born knowing anything."

Career Paths

A session on career paths traced the professional trajectories of several NIEHS scientists and administrators. Seeking out mentorship was key for all.

Laboratory animal veterinarian Dr. Sheba Churchill said she decided on her career track in seventh grade, but still had twists and turns to deal with along the way. That's when mentors are important, she said.

"I've never heard anyone say 'No, I don't want to talk to you,'" Churchill told attendees. "People love offering the benefit of their experience and helping you navigate different places, especially if they've been there."

Dr. Dondrae Coble, chief of the Comparative Medicine Branch, said he takes pride in sharing his career success as an example to students. "When they see me, it lets them know that scientific professions are an option and obtainable," he said.

NIEHS Stadtman investigator Dr. Jason Watts said that even after 10 years, he still talks regularly with his doctoral advisor. "The relationships you build can last your entire career," he said.

IRTA postdoc fellow Dr. Cindo Nicholson said mentors can help you discover hidden interests. "They were a great help in discovering interests that lie dormant in you that you never really considered before," he said.

Funding Opportunities

The last session brought together NIEHS Division of Extramural Research and Training staff to give an overview of grant mechanisms and funding opportunities for HBCU faculty.

Health scientist administrator Dr. Mike Humble described the K99/R00 Pathway to Independence Award. It is given to postdocs for the last two years of their research and they receive additional funding upon accepting their first faculty position.

That kind of award can be beneficial on the job market, he noted. "When you start applying for jobs, you can say, 'I already have research funding.'"

For more information about OSED efforts, visit online <https://www.niehs.nih.gov/health/scied/osed/index.cfm>.



Dr. Ericka Reid



At left, during a roundtable discussion about research at NCI Frederick, NCI acting director Dr. Doug Lowy gave an overview of science underway. At right, legislators (from l) representing Maryland David Trone, Chris Van Hollen and Ben Cardin are greeted on arrival at NCI-Frederick by Dr. Lawrence Tabak, performing the duties of NIH director. (Frederick County community level for Covid-19 was at low at the time of the meeting.)

PHOTOS: CHIA-CHI CHARLIE CHANG

Frederick

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Cancer Moonshot initiative. Lowy gave an overview of science underway, highlighting patient-derived xenograft models for rare adult and pediatric cancer types and the Biopharmaceutical Development Program (BDP) for developing therapeutics.

BDP, Lowy noted, includes NCI's CAR T-cell Manufacturing Program, which supports multi-center clinical trials to advance this approach for difficult-to-treat cancers, including pediatric acute myeloid leukemia and several pediatric and adult solid tumors.

Trone took to Twitter to express his gratitude for the tour. "As a cancer survivor, my visit to @theNCI was personal. The Cancer Moonshot Initiative is a call to America's best and brightest to pool resources and develop a cure. Thank you to @SecBecerra, @SenatorCardin and @ChrisVanHollen for joining me. Together, we can beat this thing!"

Also participating in the briefing, Dr. Melinda Hollingshead, chief of the Biological Testing Branch in NCI's Developmental Therapeutics Program, who oversees NCI's Patient-Derived Models



Dr. Melinda Hollingshead chats with Becerra.

Repository, described the repository program and showed samples.



At left, visiting the NCI campus in Frederick are (from l) HHS Region 3 director Dr. Ala Stanford, U.S. Sen. Chris Van Hollen (D-MD), U.S. Sen. Ben Cardin (D-MD), HHS Secretary Xavier Becerra, U.S. Rep. David Trone (D-MD), NCI acting director Dr. Doug Lowy and Dr. Lawrence Tabak, performing the duties of NIH director. At right, visitors in the Patient-Derived Models Laboratory observe Carrie Bonomi showing "flasks of primary tumor cells derived directly from patient tumor material. The large flask on the left contains cells isolated from an ovarian tumor; most tumors from non-bone marrow sources give rise to cells that adhere to a tissue culture flask so the media remains clear because the cells are attached and not floating in the media. The small flask on the right contains cells from a human lymphoma. Lymphoma-derived tumor cells generally grow in suspension (not attached to the flask surface) so the media becomes cloudy as the cells proliferate and float in the growth media. The media in the small flask is also more yellow in color than the large flask; this is a color change associated with proliferation of the cells and consumption of the nutrients in the media," explained Dr. Melinda Hollingshead.



In the Patient-Derived Models Laboratory of Hollingshead, chief of the Biological Testing Branch of the Developmental Therapeutics Program in NCI's Division of Cancer Treatment and Diagnosis are (from l) Bonomi, Hollingshead, Becerra, Trone, Stanford, Van Hollen, Cardin, Lowy and Kelly Dougherty.

Bertagnolli To Take Helm as New NCI Director

On Aug. 10, President Joe Biden announced his intention to appoint Dr. Monica Bertagnolli as the 16th director—and first female director—of the National Cancer Institute. She brings decades of clinical and leadership experience to the post, including spearheading Biden's Cancer Moonshot Initiative.



Dr. Monica Bertagnolli

PHOTO: BRIGHAM AND WOMEN'S HOSPITAL

Currently, Bertagnolli is the Richard E. Wilson professor of surgery

in the field of surgical oncology at Harvard Medical School, as well as a surgeon at Brigham and Women's Hospital and a member of the Gastrointestinal Cancer and Sarcoma Disease Center at Dana-Farber Cancer Institute.

Bertagnolli served as an associate surgeon at the Strang Cancer Prevention Institute in New York City and as an attending surgeon at New York-Presbyterian Hospital- Weill Cornell Medical Center before joining the Dana-Farber Cancer Institute.

A surgeon-oncologist, she specializes in treating gastrointestinal cancers and advocates for increasing the diversity of patients enrolled in clinical trials. She currently serves as vice president of the Coalition of Cancer Cooperative Groups, chair of Alliance for Clinical Trials in Oncology, president of the Alliance for Clinical Trials in Oncology Foundation and CEO of Alliance Foundation Trials, LLC. She formerly served as president of the American Society of Clinical Oncology and was recently elected as a fellow of the National Academy of Medicine.

Bertagnolli earned her bachelor's degree from Princeton University and her Ph.D. from the University of Utah School of Medicine. She completed her residency at Brigham and Women's Hospital.

Longtime NCI deputy director Dr. Douglas Lowy has served as acting NCI director since Dr. Ned Sharpless stepped down in April 2022.

"Dr. Lowy's willingness to serve in this role on three separate occasions is testament to his unwavering commitment to furthering the mission of NCI," said Dr. Lawrence Tabak, performing the duties of the NIH director. "Please join me in congratulating Dr. Bertagnolli on her historic appointment and in thanking Dr. Lowy for his remarkable service as he resumes his position as NCI deputy director."

Afterwards, the group visited Hollingshead's lab to see a demonstration of the work and to get a look at patient-derived models of cancer under a microscope.

"I applaud @POTUS for reigniting the Cancer Moonshot to defeat cancer," tweeted Van Hollen. "It was great to join leaders of @NIH & @theNCI to tour labs at @NCIFredOutreach w/@SecBecerra @senatorcardin @repdavidtrone. We made it

to the moon &—w/ingenuity & resources—we will end cancer as we know it."

Stanford, a board certified pediatric and adult general surgeon, also posted about the visit on Twitter: "Full circle moment. I spent yrs in a basic science lab during my surgical training. Now @theNCI understanding how they work towards health cures & equality w/#CancerMoonShot support. Excited to work together for best health outcomes."

Public Comments Wanted on ODS Strategic Plan Draft

The Office of Dietary Supplements has initiated a process that will culminate in publication of the ODS Strategic Plan for 2022-2026.

To help, input is requested from the research community and other interested individuals. The overall purpose of the planning effort is to identify both new opportunities and emerging needs for incorporation into ODS programs.



Comment and suggest on the draft plan (bit.ly/3vW5Xnz) regarding these important issues:

- Are there additional emerging public health issues that ODS can help address?
- Are there existing knowledge gaps that ODS can help address (not included in the current plan)?
- Is there anything ODS can do differently to meet stakeholder needs?

Email responses no later than Wednesday, Aug. 31 to ODSplan@od.nih.gov.

Nye

CONTINUED FROM PAGE 1

a science communicator and educator. He began his scientific career as a mechanical engineer for Boeing and eventually left to pursue a comedy career, which took off with his famous 90s television series “Bill Nye the Science Guy.”

“I became a mechanical engineer because I like stuff,” he explained. That love of “shiny objects,” as he calls it, translates well to the discipline of climate science because of the many technological problems climate change presents.

What are some of those problems? There are three main ones, according to Nye: clean water, renewable and reliably produced electricity and access to global information (the internet).

“If we had those three things for everybody in the world,” he said, “everybody would be healthy.” A healthier world would also mean that we could have more time and energy to devote to improving the health of the environment.

The main driver of climate change in the world today is the buildup of carbon dioxide gas (CO₂) in the atmosphere. This CO₂ accumulation is largely produced by burning fossil fuels such as coal, oil and gas to power vehicles and generate electricity.

Fossil fuels are the ancient remnants of animal and plant matter that have decomposed and turned into carbon-rich deposits.

Humans have figured out how to use those deposits (coal, natural gas and crude oil) for energy. When we burn fossil fuels to generate power, the CO₂ gas remains trapped by the Earth’s atmosphere.

CO₂ is called a “greenhouse gas” because it traps heat, much like a greenhouse in a garden. Sunlight “passes through these [CO₂] molecules and spreads out into a longer wavelength of light, called infrared, when it hits the ground,” Nye explained. “CO₂ and other heat-trapping molecules [absorb the infrared energy and] hold it in.”

How can we change our practices and stop excess CO₂ from continuing to build up in the atmosphere?

Making sustainable switches in electricity is one change that will have a significant impact on mitigating climate change, Nye said. Transportation produces the highest proportion of greenhouse gas emissions in the U.S. If that isn’t reason enough for change, we have found that gas and diesel motors are also far less efficient than electric ones.

“If we take all the energy in gasoline or diesel fuel and then have [someone] figure out how much energy is theoretically possible to get out of that gallon or liter of gasoline, and then ask how far a car can go on that, it’s barely 30 percent,” Nye explained.

In other words, gas and diesel motors are not very good at using all the energy that is available in their fuel. By comparison, most electric motors are well over 90 percent

efficient—and they can also be powered by renewable energy sources such as wind and solar power.

There is still work that needs to be done on these technologies, Nye admitted, suggesting to his audience: “Now, you, the young people out there and everyone watching...I want you to solve these problems.”

His set of tasks involved figuring out how to transition from a centralized electricity grid to one that relies on numerous energy sources, such as offshore wind farms and solar panels on people’s homes. Even young viewers could have an impact, he said, by asking their communities to start centers for recycling.

Nye acknowledged the world is facing a significant set of challenges to halt the progress of climate change, but he emphasized the importance of hope.


“You have to be optimistic; if you aren’t, you won’t get anything done,” he reasoned. “You go to a sports game because you believe your favorite team will win.”

Change is built into our very government, he said, which is why the U.S. has succeeded as a country. And it is that capacity for change that will allow us to be a leader in the global transition to clean energy.

“The government is like science in that it’s changing and improving and working its way toward the so-called more perfect union,” Nye said. And the federal government is taking the lead at home by implementing the Federal Sustainability Plan, which set out five ambitious goals to reduce emissions by federal operations, invest in clean energy and help communities become clean, resilient and healthy. Under this plan, the U.S. government will achieve net-zero emissions by 2050.

At the end of his talk, Nye was asked, “If you could pick any time on Earth to live in, what would you choose and why?”

Perhaps surprisingly, Nye said “this would be the time...as much trouble as there is and as hard as things are, the world is actually better for more people than it has ever been in human history. There is no better time to be alive than right now and changes we are making will change so many people’s lives for the better.”

Visit <https://www.sustainability.gov/index.html> for more information. To view the archived lecture, visit: <https://www.youtube.com/watch?v=xj3grRM1q7o>. 



President Joe Biden records a video with Nye in November 2021 on the South Lawn of the White House.

OFFICIAL WHITE HOUSE PHOTO: ADAM SCHULTZ

New Insights into HIV Latent Cells Yield Possible Cure Targets

Scientists from NIAID's Vaccine Research Center and colleagues used cutting-edge technology to reveal new insights into cellular reservoirs of HIV. These new insights could have big implications toward an HIV cure.

An enhanced understanding of the HIV-infected memory CD4+ T cells that persist over decades in individuals taking antiretroviral therapy has been a long-time goal of HIV cure researchers. However, technology limitations have made it difficult to isolate or analyze these individual cells. As a result, scientists have been unable to determine whether the cells possess distinctive attributes that HIV-cure-directed therapies may exploit.

At the International AIDS Conference in Montreal, Dr. Eli Boritz, chief of the virus persistence and dynamics section in the VRC Laboratory of Immunology, described NIAID's longstanding collaboration with a bioengineering research group at the University of California, San Francisco.

The researchers developed a custom microfluidic sorting technology—Focused Interrogation of Cells by Nucleic Acid Detection and Sequencing (FIND-Seq). This technology defines gene expression patterns from rare cells harboring latent HIV, allowing messenger RNA capture and virus DNA detection to be performed sequentially while maintaining segregation among cells.

The scientists applied the FIND-Seq technology to blood cells from 6 people with HIV who had begun taking ART while chronically infected and who had experienced more than 1 year of viral suppression. They found clear differences between the HIV-infected CD4+ T cells and their uninfected counterparts, including gene expression patterns linked to the suppression of multiple steps in the HIV lifecycle and to cell survival and proliferation.

The scientists maintain these results indicate that the HIV-infected memory CD4+ T-cell reservoir is a distinctive cell population that may be uniquely susceptible to specific targeted therapies. In this regard, the study reinforces recent interest among scientists in improving upon HIV cure strategies that are based on latency reversal by incorporating drugs that relieve blocks at multiple HIV lifecycle steps, and by combining these with agents that potentiate physiologic cell death.

High-Tech Imaging Reveals Details About Rare Eye Disorder

Using a new imaging technique, NEI researchers have determined that retinal lesions from vitelliform macular dystrophy (VMD) vary by gene mutation. Addressing these differences may be key in designing effective treatments for this and other rare diseases.



Retina with egg-yolk-like lesion in a person with vitelliform macular dystrophy

PHOTO: NEI

VMD is an inherited genetic disease that causes progressive vision loss through degeneration of the light-sensing retina. Genes implicated in VMD include *BEST1*, *PRPH2*, *IMPG1* and *IMPG2*. Depending on the gene and mutation, age of onset and severity vary widely. All forms of the disease have in common a lesion in the central retina (macula) that looks like an egg yolk and is a build-up of toxic fatty material called lipofuscin.

VMD affects about 1 in 5,500 Americans and there is currently no treatment for this condition.

Dr. Johnny Tam, head of the NEI clinical and translational imaging unit, used multimodal imaging to evaluate

the retinas of patients with VMD at the Clinical Center. Tam's multimodal imaging uses adaptive optics—a technique that employs deformable mirrors to improve resolution—to view live cells in the retina, including the light-sensing photoreceptors, retinal pigment epithelial (RPE) cells and blood vessels in unprecedented detail.

Tam and his team collaborated with clinicians at the NEI Eye Clinic to characterize 11 participants using genetic testing and other clinical assessments, and then evaluated their retinas using multimodal imaging. Assessment of cell densities (photoreceptors and RPE cells) near VMD lesions revealed differences in cell density according to the various mutations. Tam is using multimodal imaging on other retinal diseases, including age-related macular degeneration.

Studying How Sound Suppresses Pain

Research has long supported the notion that music and other kinds of sound can help alleviate acute and chronic pain. In a new study, published in *Science*, an international team of scientists used mice to explore neural pathways through which sound blunts pain.



A cancer patient listens to music.

PHOTO: PHOTOGRAPHEE.EU/SHUTTERSTOCK

The scientists first exposed mice with inflamed paws to three types of sound: a pleasant piece of classical music, an unpleasant rearrangement of the same piece and white noise. All three reduced pain sensitivity in the mice when played just slightly louder than background noise (about the level of a whisper). The effect lasted well beyond the sound itself—for at least 2 days after exposure to the sound 3 days in a row for 20 minutes. When played louder, the sounds had no effect on the animals' pain responses.

Pain perception can be affected by emotions and stress. However, the scientists discovered that low-intensity sound affected the animal's perception of pain through another mechanism.

To explore the brain circuitry underlying this effect, the team used techniques to trace connections between brain regions. They identified a route from the auditory cortex, which receives and processes information about sound, to the thalamus, which acts as a relay station for sensory signals, including pain, from the body. In freely moving mice, low-intensity white noise reduced the activity of neurons in the thalamus at the receiving end of this pathway.

Suppressing the pathway in the absence of sound, the team found, mimicked the pain-blunting effects of low-intensity noise. In contrast, activating the pathway restored the animals' sensitivity to pain in the presence of sound. The scientists also identified distinct brain circuits through which sound blunted pain from hind paws and forepaws.

It is still unclear if similar brain processes are involved in humans. Other aspects of sound, such as its perceived harmony or pleasantness, may be important for human pain relief. "We don't know if human music means anything to rodents, but it has many different meanings to humans; you have a lot of emotional components," said Dr. Yuanyuan Liu of NIDCR.

"By uncovering the circuitry that mediates the pain-reducing effects of sound in mice," said NIDCR director Dr. Rena D'Souza, "this study adds critical knowledge that could ultimately inform new approaches for pain therapy."

The team was led by researchers at NIDCR; the University of Science and Technology of China, Hefei; and Anhui Medical University in Hefei, China.—adapted from *NIH Research Matters*



NIH'ers across 25 institutes and centers were recognized for Future of Work initiatives.

IMAGE: IDEA INK DESIGN/SHUTTERSTOCK

EXPERTISE ACKNOWLEDGED

Teams Recognized for 'Future of Work Phase 1'

BY MARTHA RANDAZZO

More than 130 NIH professionals from 25 institutes, centers and offices were recognized Aug. 2 at the NIH executive officers meeting for their time, expertise and contributions to phase 1 of the NIH Future of Work (FOW) initiative.

NIH deputy director for management Dr. Alfred Johnson congratulated the volunteers, subject matter experts and co-leads of seven work groups for developing initial FOW recommendations spanning administrative functions, infrastructure support and services, space, surety, technology and tools, workforce and a resource hub.

Despite the challenges of the SARS-CoV-2 pandemic, the teams answered the call of the strategic administrative management advisory committee (SAMAC), an executive governance body for planning, to convene in June 2021 and consider the multifaceted needs and issues of communities and programs amid the new and emerging FOW realities in support of the NIH scientific mission.

The teams developed initial recommendations for presentation to SAMAC in

December 2021, followed by refinement and scoping for SAMAC's elevation to the management and budget working group for consideration in spring 2022. This effort was recognized as instrumental in laying the groundwork for FOW's next phase.

At the recognition meeting, SAMAC co-chairs Janet Shorback, director of the Office of Strategic Planning and Management Operations, and Kathleen Stephan, NIDCR executive officer, thanked volunteers for their contributions and co-leads for guidance of their respective teams in sorting through the challenges and opportunities that lie ahead for NIH.

The co-leads commended the work groups' dedication and provided highlights of each group's accomplishments:

- **Administrative functions work group**, co-led by Glenda Conroy, director of the Office of Financial Management, Diane Frasier, director of the Office of Acquisition and Logistics Management, and Sally Lee, NIGMS executive officer. Developed recommendations spanning six subgroups, including travel and hosted conferences; acquisitions, budget and finance; institute and center councils and reviews and boards of scientific counselors; remote telework supplies and equipment; shipments, delivery and storage; and awards and grants management.

- **Infrastructure support and services work group**, co-led by Darla Hayes, OD executive officer, Keith Lamirande, NCATS executive officer, and Tim Tosten, associate director for program and employee services, Office of Research Services. Created priority recommendations for transportation, property, virtual infrastructure, building improvements, among other areas and shared recommendation overlaps with the other future of work teams.

- **Space work group**, co-led by Joanna Bare, director of business transformation at NHLBI, Dan Wheeland, director of the Office of Research Facilities, and Mitch Williams, NIEHS executive officer. Recommended guiding principles, adjustments and strategies for effective space utilization to be used for planning purposes in the future of work era.

- **Surety work group**, co-led by Jason Ford, NIBIB executive officer, Dan Lonnerdal, CC executive officer, and Jessica McCormick-Ell, director of the ORS Division of Occupational Health and Safety. Recommended implementation plans for five priority areas that focus on NIH's safety, security and emergency management.

- **Technology and tools work group**, co-led by Asmahan Limansky, chief business transformation officer at CIT, and Tim Wheelles, NIDCD executive officer. Created three initiatives to support a hybrid workplace environment through meeting and collaboration strategies and virtual tools.

- **Workforce work group**, co-led by Deborah Coelho, director of the Workforce Relations Division, Office of Human Resources, and Camille Hoover, NIDDK executive officer. Conducted focus groups across NIH and developed a workforce engagement toolkit and related resources to support NIH's hybrid workplace environment, in addition to an IdeaScale campaign to invite community ideas and resources for the toolkit located on the Resource Hub.

- **Resource Hub work group**, co-led by Alisa Machalek, NIAMS science communications team lead, and Sybil Philip, NICHD deputy executive officer. Developed a SharePoint site for phase 1 information on Future of Work efforts.

Learn more at <https://nih.sharepoint.com/sites/NIH-fow>.

NEI's Steinmetz Is Mourned

BY KATHRYN DEMOTT

Dr. Michael Steinmetz, 70, director of the NEI Division of Extramural Science Programs (DESP), died July 30, following a boating accident.

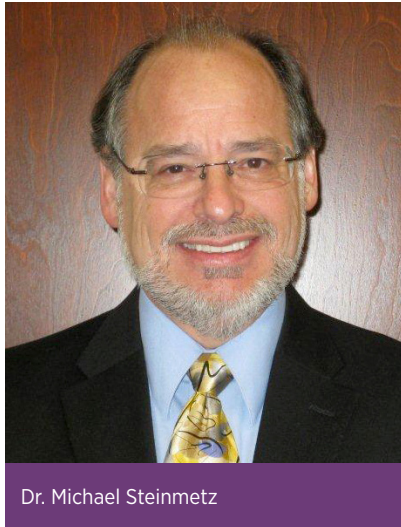
He joined NEI in 2007 as director of the Strabismus, Amblyopia and Visual Processing Program. He was named DESP director in 2014 and stepped up as NEI acting deputy director from 2017 to 2018.

"During his 15-year NEI career, Dr. Steinmetz's influence expanded well beyond the institute," said NEI director Dr. Michael

Chiang. "His legacy made a difference in vision and neuroscience programs throughout the National Institutes of Health."

Steinmetz served on several NIH committees. Early involvement of NEI in the NIH

He was a true leader in how DESP functions, supporting his staff and the full breadth of science that NEI funds. Somehow, he knew vast amounts about the science across the entire NEI portfolio.



Dr. Michael Steinmetz

Steinmetz came to NIH in 2003 as a referral officer and scientific review officer for the central visual processing and the cognitive neuroscience study sections in the Center for Scientific Review.

Prior to joining NIH, he was part of the neuroscience department at Johns Hopkins School of Medicine. In 1994, he helped establish the Johns Hopkins Zanvyl Krieger Mind/Brain Institute, where he

studied visual processing in primates.

Steinmetz earned a bachelor's degree in zoology from the University of Michigan and a master's in biology and a Ph.D. in physiology from Michigan State University.

"Above all, Mike was a gentle and exceptional mentor, always taking the time to offer his support and guidance to colleagues. His sense of humor made everyone feel at ease."

-DR. SANGEETA BHARGAVA

BRAIN Initiative and NIH Blueprint was in large part due to his vision of NEI's potential for helping guide neuroscience research.

He spearheaded NEI support of the NIH Common Fund's High-Risk, High-Reward Research Program. He also championed a partnership between NEI and the Department of Defense to address gaps in the treatment of eye injuries among civilians and military veterans.

At NEI, he was the guiding force of the Audacious Goals Initiative; its early successes were due in no small part to his insights and motivation.

More recently, he mobilized efforts to put the institute strategic plan into action by starting trans-NEI working groups for implementation.

"Above all, Mike was a gentle and exceptional mentor, always taking the time to offer his support and guidance to colleagues," said Dr. Sangeeta Bhargava, director of clinical trial research in DESP. "His sense of humor made everyone feel at ease. He exuded a genuine kindness that felt like a gift to everyone who had the privilege of working with him."

Outside of work, Steinmetz enjoyed a rich life that included his family and many friends. His passion was scuba diving and teaching others how to dive. Several DESP staff are certified divers because of him.

Steinmetz is survived by his wife, Susan, and his daughter, Sarah Heisey. 

Participants Needed for Liver Damage Study

NIAAA invites volunteers ages 21-65 to participate in a study evaluating the safety of an investigational drug to treat alcohol-associated liver damage. Volunteers should be healthy, drug-free and not seeking treatment for alcohol-related problems. Research participation includes seven outpatient visits that consist of receiving study drug (or placebo), blood draws and filling out questionnaires. Compensation up to \$2,640 may be provided. For more information, call the Office of Patient Recruitment at (866) 444-2214 (TTY users dial 711) or visit <https://bit.ly/3JB7cOG>. Refer to study #000036-AA.

EBV Vaccine Study Seeks Volunteers

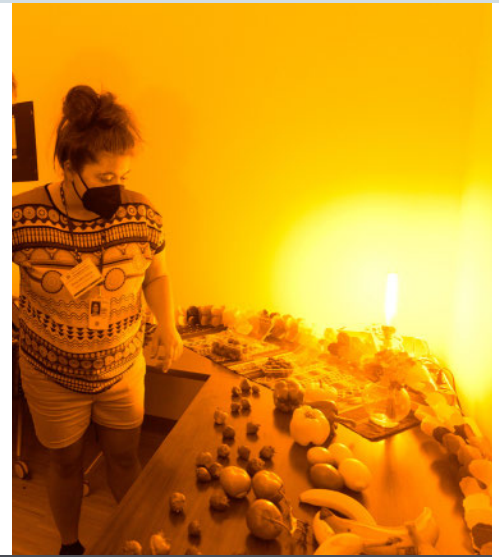
NIAID researchers seek to enroll healthy volunteers ages 18-29 living in the D.C., Maryland and Virginia areas in an investigational Epstein-Barr virus (EBV) vaccine clinical trial. If you are eligible, consider joining to help research into stopping spread of EBV, which is the most common cause of infectious mononucleosis (mono) and is associated with some cancers. For more information, contact the Office of Patient Recruitment at (866) 444-2214 (TTY users dial 711) or ccopr@nih.gov. Refer to study #21-I-0005 Online: <https://go.usa.gov/xsYK5>.

Diet and SCD Study Seek Adults

Does diet affect sickle cell disease (SCD)? Clinical Center researchers are conducting a study to help discover the answer. The study will examine the impact of diet and nutrition on the health of adults living with SCD. If you are age 18 or older, diagnosed with SCD and wish to participate, contact the Office of Patient Recruitment at (866) 444-2214 (TTY users dial 711) or email: ccopr@nih.gov. Refer to study #000518-CC. Online: <http://go.usa.gov/xzFeR>.

People with Liver Cancer Sought

NCI researchers are conducting an imaging study on people with liver cancer (hepatocellular cancer or HCC). You are eligible to participate if your doctors have determined that you may have HCC based on previous standard imaging. Call 240-858-7406 (TTY users dial 711) or email HCCreferrals@mail.nih.gov. Refer to study # 000080-C. Online: <https://go.usa.gov/xuh92>.



At left, 10 NEI Eye on the Future science video contest awardees visit the NIH campus July 22. At right, Rosa Lafer-Sousa discussed color perception research in the sodium-light room.

‘EYE ON THE FUTURE’ NEI Hosts Student Video Contest Winners

BY KATHRYN DEMOTT

A July 22 event welcomed 10 teens from across the country as a reward for their winning submissions to the first-ever NEI “Eye on the Future” video competition. More than 40 high school students submitted 3-minute science-themed videos to the contest, which encouraged participation by populations underrepresented in biomedical science.

NEI awarded cash prizes to first-place winner Meenakshi Ambati, second-place winner Ethan Dunn and third-place winner Sanjana Kumar. Top contest winners and honorary awardees were invited to visit NIH via an expense-paid trip. The awards ceremony was the first in-person NIH student event since the start of the pandemic.

Students and their parents toured campus with stops at the NIH animal facility for a cow eye dissection. They also explored a sodium-light room designed to show concepts of color perception (strawberries appear a ghastly grey). They played cornhole and, of course, had ice cream.

Dr. Lawrence Tabak, performing the duties of NIH director, and NEI director Dr. Michael Chiang welcomed the students in the newly renovated Bldg. 31C conference center. Chiang emphasized NIH’s interest in encouraging young people—the future NIH workforce—to pursue biomedical research.

NIH chief officer for scientific workforce diversity Dr. Marie Bernard moderated a panel discussion of four vision scientists while the visiting students fired questions, eager to get the inside scoop on life as a researcher.

Following the panel, students visited booths to learn about training programs offered by NEI and the Foundation for Advanced Education in the Sciences. The young people tested their hand-eye coordination at a booth sponsored by the National Institute of Neurological Disorders and Stroke. And they test-drove NEI’s “See What I See” virtual reality app to experience visual effects from glaucoma, cataract and age-related macular degeneration.

NEI communications director Maria

Zacharias closed the event by asking the students to consider themselves ambassadors for the program and to encourage other students to submit videos to the contest next year.

See this year’s winning videos, <https://www.nei.nih.gov/learn-about-eye-health/outreach-campaigns-and-resources/eye-future-video-contest>.



At the awards event are (from l) Dr. Angela Elam, Dr. Michael Chiang, Dr. Lawrence Tabak and Dr. Kristen Nwanyanwu.

PHOTOS: MARLEEN VAN DEN NESTE



At left, first place winner, Meenakshi Ambati dissects a cow eye. At right, students join panelists (seated, from l) Dr. Gaby Costello, Dr. Juan Angueyra-Aristizabal, Dr. Marie Bernard (moderator), Elam and Nwanyanwu for a group picture.