

FIRST CAMPUS VISIT

Trump Gets Update on Coronavirus Research

In his first visit to NIH on Mar. 3, President Donald Trump learned about NIH's research response to the coronavirus now sweeping the globe. At a videocast roundtable conducted at the Vaccine Research Center, he learned that NIH is "like the SWAT team of going out and responding to emerging microbes," explained NIAID director Dr. Anthony Fauci.

"This group is so good at what they do," said Fauci, referring to the VRC staff that was originally formed to address the HIV/AIDS crisis, "that every time we have a challenge, and that challenge could be flu, that



NIAID director Dr. Anthony Fauci discusses coronavirus with President Trump at NIH.

challenge could be Ebola, that challenge could be anything—we always turn to this team to do that."

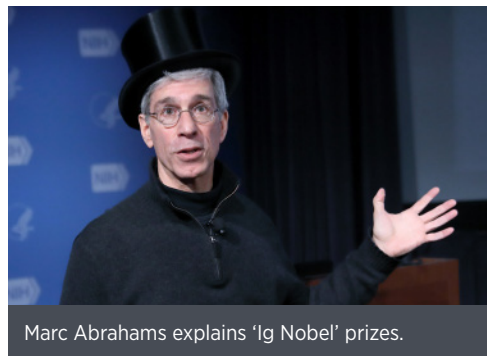
Fauci gave the President a primer on the experiences over the last two decades of emerging and re-emerging infectious

diseases, including SARS, MERS, Zika and various types of influenza that have threatened global health.

Once the SARS pathogen was identified in 2003, Fauci explained, it took 20 months before a phase 1 (safety) vaccine trial was begun. Subsequent vaccine programs steadily trimmed this time—but for COVID-19, the phase 1 trial is on track to begin in less than 3 months. In each case, scientific savvy built on past experience helped out with the next viral threat.

In a variety of forums in early March, Fauci underscored that the phase 1 trial is just the beginning of a series of larger clinical trials and scale-up efforts, all focused on assuring that the vaccine is safe and effective. Even working at record speed, Fauci predicts that wide availability

SEE **PRESIDENT**, PAGE 6



Marc Abrahams explains 'Ig Nobel' prizes.

'Ig Nobel' Prizes Reward Funny, Thought-Provoking Science

BY ERIC BOCK

Dead magnetized cockroaches behave differently than living magnetized cockroaches. Pizza might protect against illness and death—if the pizza is made and eaten in Italy. A typical 5-year-old child produces 500 ml of saliva per day. These are just a few of the research findings awarded Ig

SEE **IG NOBELS**, PAGE 4

SAVOR THE MOMENT

Yale Professor Divulges Strategies for a Happy Life

BY DANA TALESNIK

If you think happiness is genetic, you may be half right, or half wrong, depending on your outlook. While research shows that some



Dr. Laurie Santos

genetic factors contribute to happiness, even if you're a genetically predisposed grump, there's plenty you can do to find and cultivate happiness, and perhaps spread a little joy to others too.

Two years

SEE **HAPPINESS**, PAGE 8



First Lady returns for Valentine's Day; see p. 12.

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Stakeholder Engagement Is Webinar Topic, Mar. 25

The Office of Disease Prevention (ODP) will hold a Methods: Mind the Gap webinar with Dr. Melody Goodman on Wednesday, Mar. 25 at 11 a.m.

Stakeholder engagement in research is an evidence-based approach for addressing health disparities and has the potential to increase the quality of research through higher participation rates, insightful interpretation of findings and greater reliability and validity of measures in diverse populations.



Dr. Melody Goodman

In this presentation, Goodman will discuss her efforts to develop and validate quantitative measures of stakeholder engagement in research and research literacy. She is associate dean for research and associate professor of biostatistics in the School of Global Public Health at New York University.

Registration is required at prevention.nih.gov/education-training/methods-mind-gap/developing-and-validating-metrics-and-measures-stakeholder-engagement-research. The webinar will be recorded and available on the ODP website within about a week.

Educational Telecommunications Association Visits NIH

Members of the National Educational Telecommunications Association (NETA), a trade association of public broadcasters, visited NIH recently as part of an education innovation field trip following their annual conference. They started with a tour of the National Library of Medicine, which included exploring the History of Medicine Division Reading Room.



Dr. Jon Lorsch

Afterwards, NETA members met with NIGMS director Dr. Jon Lorsch and Dr. Tony Beck, program



Maryland's First Lady Visits Children's Inn at NIH

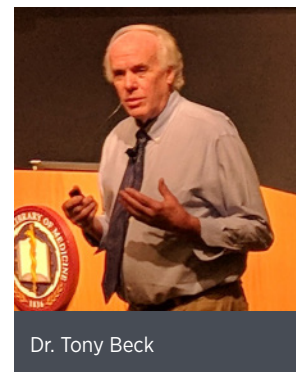
Maryland first lady Yumi Hogan recently visited the Children's Inn at NIH for a tour and to participate in an art activity with NIH pediatric patients residing at the inn. At left, Hogan is pictured with inn CEO Jennie Lucca and inn resident Princess, 7. Princess is holding up a decorated heart with artwork and an inspirational message created by Hogan, while Lucca is holding a heart created by first lady Rose Dunleavy of Alaska, where Lucca grew up. At lower left, Hogan helps inn resident Eamon, 7, paint as part of an arts and crafts project. Below, Hogan, wife of Maryland Gov. Larry Hogan, talks to patient Noah, 22, her mom, Gisela and Lucca to learn more about Noah's treatment for two ultrarare diseases as part of clinical studies conducted at NHLBI and NIH's Undiagnosed Diseases Program.

PHOTOS: JEN FORESTER



director for NIH's Science Education Partnership Award (SEPA) program. Lorsch discussed the importance of basic science, highlighting regeneration research and its potential applications. He also spotlighted numerous science education resources developed through the SEPA program (<https://www.nigms.nih.gov/education/sepa-teaching-resources>), as well as resources available from across NIH.

Beck followed with details about the SEPA program, which funds STEM and informal science education projects for grades pre-K through 12, created through partnerships between biomedical and clinical researchers and educators and other interested organizations. He ended his talk with a brief overview of how to apply for a SEPA grant.



Dr. Tony Beck

The visit concluded with a Q&A session.



NETA at the National Library of Medicine

NIAMS Coalition Discusses Funding, Science Advances

Finding new ways to expand the audience of researchers to learn about funding opportunities was among the topics discussed at the recent NIAMS Coalition Outreach and Education Meeting.

The biennial meeting brings NIH staff and coalition members together to discuss what's happening at NIH and NIAMS, network and exchange ideas about how to best collaborate. The coalition is a group of more than 90 professional and voluntary organizations concerned with diseases in the NIAMS portfolio. The meeting was attended by members from more than 40 organizations.

NIAMS acting director Dr. Robert Carter provided an overview of NIAMS and highlighted researchers who received support from both NIAMS and coalition organizations and are making outstanding contributions to research. He discussed the importance of communicating funding opportunities, explaining, "This topic is relevant not only to scientists applying for grants but also to the advocates, patients and caregivers who are impacted by the conditions in our mission areas." He then opened the floor to attendees to provide feedback on ways NIAMS can best communicate funding opportunities to their constituents.

The group learned about patient engagement strategies from Dr. Eleanor Perfetto, executive vice president of strategic initiatives for the National Health Council, who emphasized the importance

of including patients at every stage of research, from protocol development to delivery of care. She emphasized that meaningful patient engagement involves bi-directional relationships between patients and other stakeholders so that research questions and outcomes are truly patient-centric.

NCCIH director Dr. Helene Langevin discussed advances in chronic pain research and the importance of studying both the body and brain when developing therapeutic strategies for pain management. She emphasized that an integrative approach that considers the body's structural components, underlying connective tissues and the mind is critical for developing new strategies to combat chronic pain.

A series of breakout sessions covered topics ranging from how coalition groups can help reach new audiences about NIH funding opportunities to best practices to engage minority and underserved audiences. Key points included strategies for coalition

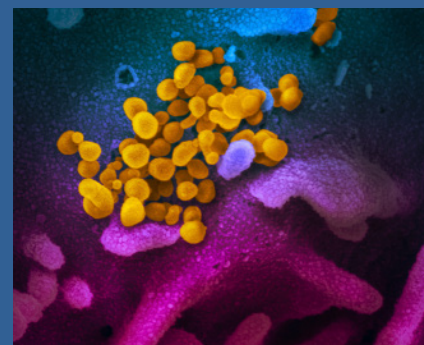
members to get more involved in research efforts and best practices for staying up to date on NIAMS funding updates so they can share these opportunities with their organizations.

The meeting concluded with updates on NIH's All of Us Research Program from Dr. Dara Richardson-Heron, chief engagement officer, who said they have more than 400 enrollment clinics across the nation and have enrolled more than 200,000 volunteers to date. The program plans to collect and study data over a long period of time and aims to change the face of health care once all the data is shared with the scientific community.—Stephanie Mathews **R**



Participants at the recent NIAMS Outreach and Education Day meeting

PHOTO: NIAMS



ON THE COVER: Novel Coronavirus SARS-CoV-2. Scanning electron microscope image shows SARS-CoV-2 (yellow)—also known as 2019-nCoV, the virus that causes COVID-19—isolated from a patient in the U.S., emerging from the surface of cells (blue/pink) cultured in the lab.

IMAGE: NIAID ROCKY MOUNTAIN LABORATORIES

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Ig Nobels

CONTINUED FROM PAGE 1

Nobel Prizes in 2019.

Ig Nobel Prizes honor achievements “that are so surprising that they make people laugh and then think,” said Marc Abrahams, founder of the annual Ig Nobel Prize ceremony and editor of the magazine *Annals of Improbable Research*, at the Feb. 19 Wednesday Afternoon Lecture in Lipsett Amphitheater.

The magazine has awarded 10 Ig Nobel prizes each year since 1991. Award recipients are offered the prize in secret. Recipients can decline if they like, but “happily, almost everybody who’s offered a prize accepts,” said Abrahams. Quite often, the recipients don’t realize that what they’ve done is funny, although “everyone else does.”

Winners travel at their own expense to a ceremony at Harvard’s largest auditorium, Sanders Theater. There, real Nobel laureates present Ig Nobel awardees with their prizes. Every winning team gets 10 trillion Zimbabwean dollars.

“If you win an Ig Nobel Prize, you will almost certainly get a lot of attention from a lot of journalists around the world,” Abrahams said. “Please take advantage of it any way you can.”

Over the years, the ceremony has picked up several traditions, he explained. Attendees toss paper airplanes in the auditorium. An 8-year-old girl named “Miss Sweetie Poo” yells “Please stop, I am bored” if an acceptance speech goes on past its allotted time. She won’t stop until they do “and it works!” Since 1996, professional opera singers, accompanied by Nobel laureates, perform a

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“If you win an Ig Nobel Prize, you will almost certainly get a lot of attention from a lot of journalists around the world. Please take advantage of it any way you can.”

—MARC ABRAHAMS

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three- or four-song opera.

In addition to being funny, Ig Nobel awards also make people think. Abrahams said these awards stick in people’s minds. “All they want to do for the next week is talk about it with their friends,” he said.

In 2009, Dr. Elena Bodnar and her colleagues received the Ig Nobel Public Health Prize for designing a bra that could be quickly converted into a pair of gas masks, “one to save your life, one to save the life of some lucky bystander,” said Abrahams.

Bodnar, who grew up in Ukraine, was one of the doctors who treated patients after the Chernobyl nuclear accident in 1986. The meltdown triggered the release of radioactive particles into the air. She wondered why protective masks weren’t available. She got the idea for her invention after seeing her infant son put a bra on his face.

In 2018, Dr. Akira Horiuchi received the Ig Nobel Medical Education Prize for developing a self-colonoscopy to be

administered in the sitting position. The doctor noted that, in Japan, colonoscopies are not common medical procedures. As a result, most of the kinds of cancer caught early in developed countries are not caught early in Japan.

Abrahams estimates that his magazine receives 10,000 nominations per year. Consistently, 10-20 percent of these are self-nominations, which seldom win.

“Anybody who has ever started something purely to win an Ig Nobel Prize has failed,” he said. “It’s close to impossible to manufacture something intentionally that has that double quality of striking anybody as funny and making anybody curious at the same time.”

Abrahams concluded his talk the same way he concludes the ceremony each year: “If you did not win an Ig Nobel this year, and especially if you did, better luck next year.”

The full list of 2019 Ig Nobel awards can be viewed at <https://www.improbable.com/ig-about/winners/#ig2019>.



In the photos above, Abrahams explains the charm and attraction of the Ig Nobel Prizes.

PHOTOS: CHIA-CHI CHARLIE CHANG

Exposure Research Bolstered by New NIEHS Resource

NIEHS is expanding access to resources that give scientists advanced tools to better understand how the interaction of various environmental factors can affect health. The Human Health Exposure Analysis Resource (HHEAR; <https://hhearprogram.org/>) promises to strengthen research on how chemical, biological and social stressors influence health.

The program will assist eligible grantees with including such analyses in their studies. HHEAR builds on the success of the earlier Children's

Health Exposure Analysis Resource. The new initiative is funded until 2024 by NIEHS, NCI, NHLBI and the ECHO program.

Leaders provided details about HHEAR during a recent webinar. "Human health is the product of both genetic susceptibility and environmental exposure, but many human health studies have not fully considered the environmental

exposures that may affect an individual's well-being," said Dr. David Balshaw, who directs the program. "To better understand how the totality of environmental exposures, known as the exposome, may affect health and lead to disease, researchers need access to the analytical capabilities necessary to accurately measure, record and analyze environmental exposures."

HHEAR will provide the following resources at no cost to participating researchers:

- A network of exposure analysis laboratories—these labs will provide cutting-edge technologies to evaluate biological and environmental samples such as blood, urine and drinking water.
- Data science tools—the Icahn School of Medicine at Mount Sinai will support data storage, analysis and integration of data generated by the HHEAR labs.
- Administrative support—Westat Corp. will be the primary point of contact between clients and the HHEAR program. The company will coordinate efforts across lab hubs and track projects, materials and analyses.

Find out more about how to apply at <https://hhear-program.org/how-apply>.—**Sheena Scruggs**

NIEHS Sustainability Report Marks Progress in Reducing Waste, Energy Use

ENVIRONMENTALLY
SPEAKING

NIEHS recently released its 2019 Sustainability Report, with details on sustainable operations and goals related to further reducing energy use, improving recycling, cutting greenhouse gas emissions, and more. NIEHS and National Toxicology Program acting director Dr. Rick Woychik highlighted significant findings of the report.

- ✦ Reduced energy intensity by nearly 12 percent over the last 4 years. Energy intensity is a measure of efficiency across sources, accounting for both cost and energy units.
- ✦ Increased solar energy generation.
- ✦ Diverted 80 percent of solid nonhazardous waste from landfills between 2010 and 2018.
- ✦ Decreased volume of wastewater discharge by 32 percent.
- ✦ Decreased carbon dioxide emissions from the vehicle fleet by nearly 30 percent.

"The report demonstrates how our operations align with our mission to protect and enhance human health and the environment," said Paul Johnson, manager of Environmental Protection and Stewardship Programs. NIEHS is the only institute or center at NIH to regularly publish a sustainability report about its operations, he noted. "It's an example of our leadership in sustainability."

"I am especially proud of our Net-Zero Energy (NZE) warehouse and its Leadership in Energy and Environmental Design [LEED] Platinum certification," Woychik said. "It saved the equivalent of 20 metric tons of CO₂ emissions."

Statistics that did not show improvement were influenced by factors beyond the control of NIEHS. Hazardous waste production increased by more than 9,000 pounds between 2017 and 2018, in large part due to a change in waste management practices. "Certain liquids that were once permitted to be disposed to the drain began to be collected and shipped off-site for disposal in 2018, such as aqueous liquids from laboratories and rinsate from imaging processes," said Johnson.

On-site CO₂ emissions remained below the EPA reporting threshold. The downward trend was interrupted in 2018 when emission levels returned to 2008 levels. The data suggest the increase resulted from extreme temperatures that year, leading to higher fuel oil use in winter and electricity demand in summer. Installation of more efficient chillers, which provide cooling, in 2013 and 2018 at the Central Utility Plant kept electricity demand from being even higher.

"NIEHS still faces a major challenge in reducing greenhouse gas emissions," said Woychik. "We must look for every opportunity to limit our energy consumption and shift to renewable power."

He highlighted action items that are key to future gains.

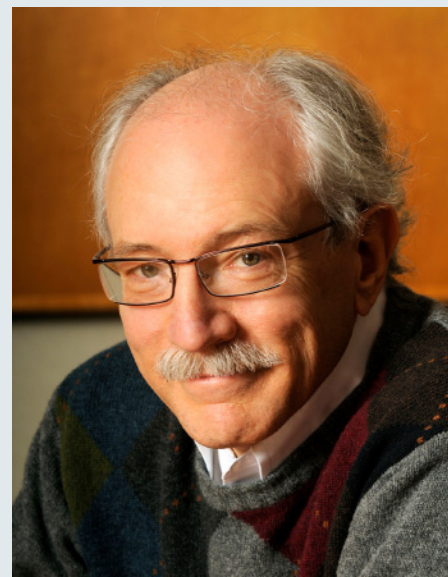
- ✦ Further modernize the data center to lower energy demands.
- ✦ Add electric fleet vehicles to reduce reliance on fossil fuels.
- ✦ Install a condensate capture and reuse system to decrease water demand.

"Biomedical research is resource- and energy-intensive. We understand that we face environmental challenges even as we try to find environmental solutions," Johnson said. "This report says: Here's what we're doing about it."—**John Yewell**



Dr. David Balshaw

PHOTO: STEVE MCCAWE



"It is our duty to promote environmental stewardship here at the institute," said NIEHS/NTP acting director Dr. Rick Woychik.

PHOTO: STEVE MCCAWE



Seated at a media briefing in the VRC are (from l) NIH principal deputy director Dr. Lawrence Tabak, VRC director Dr. John Mascola, Fauci, Trump, HHS Secretary Alex M. Azar II and NIH director Dr. Francis Collins. Also at the conference table were (below) coronavirus vaccine scientist Dr. Kizzmekia Corbett and VRC deputy director Dr. Barney Graham.

PHOTOS: CHIA-CHI CHARLIE CHANG

President

CONTINUED FROM PAGE 1

of a vaccine against COVID-19 is 12-18 months away.

“Well I want to thank you all, this is incredible,” said Trump, addressing a panel that included NIH director Dr. Francis Collins, who had opened the event with an overview of NIH’s role and accomplishments in keeping both the nation and the world healthy.

“I’ve heard about you and I know all of you by name,” said the President, “and now I

get to meet you—unfortunately I get to meet you—because we’re talking about this,” he quipped.

“NIH is the home...of the greatest doctors,” Trump added. “I heard that from my uncle—Dr. John Trump...I think the

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“NIH is the home...of the greatest doctors...I think the world is extremely happy that you’re involved.”

—PRESIDENT DONALD TRUMP

• • •

intramural and extramural roles NIH plays in medical research and the function of peer

world is extremely happy that you’re involved.

“I just want to thank everybody at NIH,” he continued. “I know you are working around the clock.”

Collins

explained both the



review in selecting projects to support. He said, “You could say we do Alzheimer’s to Zika, or A to Z, or some version of that...and we also support infrastructure that makes it possible in a time like this to be able to move rapidly in terms of developing a vaccine.”

Also present at the briefing and subsequent tour of the VRC were HHS Secretary Alex M. Azar II, NIH principal deputy director Dr. Lawrence Tabak, VRC director Dr. John Mascola, VRC deputy director Dr. Barney Graham and research fellow Dr. Kizzmekia Corbett of Graham’s staff, “who is on the front line of making this coronavirus vaccine happen,” said Collins.

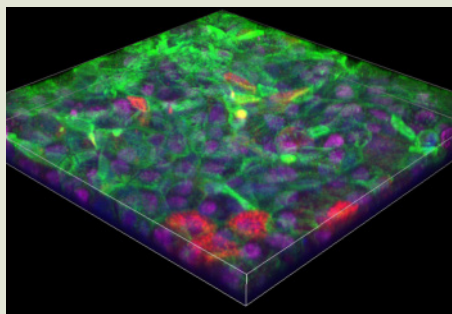
Toward the end of the 20-minute session, Trump took a handful of questions from members of the media who had accompanied him to NIH—several involving travel and border restrictions imposed by COVID-19.

At one point he paused to say, “You’re so nice today, I can’t believe it. It’s NIH—it rubbed off.”

The full event can be seen at <https://videocast.nih.gov/summary.asp?live=36104&bhcp=1>.—Rich McManus



The briefing for the President continues upstairs in the VRC.



Tissue chips are miniature, 3-D models of human tissues designed to mimic functions of the human body and support living human tissues and cells. Above is a gut chip, a 3-D confocal microscopy projection showing cell types in the human jejunal gut microphysiological system.

IMAGE: MASSACHUSETTS INSTITUTE OF TECHNOLOGY

NIH-Funded Tissue Chips Push New Boundaries in Space

With the help of a Falcon 9 rocket, NIH-supported research teams sent tiny, bioengineered models of human organs hurtling toward the International Space Station U.S. National Laboratory (ISS National Lab) at thousands of miles per hour.

The launch, which carried tissue chips modeling heart and gut tissue, took place Mar. 6 from Cape Canaveral, Fla.

Tissue chips are miniature, 3-D models of human tissues such as the lung and liver, designed to mimic functions of the human body and support living human tissues and cells.

By studying heart and gut tissue models on the ISS National Lab, researchers hope to learn more about molecular changes in heart tissues exposed to the extreme environment of microgravity and get new insights into immune responses in the intestine that could help improve human health back on Earth.

The low-gravity environment on the ISS National Lab presents valuable opportunities for research that are not found on Earth. For example, low-gravity environments can cause changes in the human body that are similar to accelerated disease and aging processes.

Because these changes happen relatively quickly, the tissue chips sent to the ISS National Lab allow researchers to model and study—on a much shorter timescale—conditions related to aging and disease that might take years to develop on Earth.

Both projects are funded through the Tissue Chips in Space initiative, which is a collaboration among the ISS National Lab, NCATS and NIBIB.

Irregular Sleep Patterns Double Risk of Cardiovascular Disease in Older Adults

Older adults with irregular sleep patterns—meaning they have no regular bedtime and wakeup schedule, or they get different amounts of sleep each night—are nearly twice as likely to develop cardiovascular disease as those with more regular sleep patterns, according to a new study funded in part by NHLBI.

The 5-year study suggests that an irregular sleep pattern may be a novel and independent risk factor for cardiovascular disease (CVD) and that maintaining regular sleep patterns could help prevent heart disease just as physical activity, a healthy diet and other lifestyle measures do, the researchers said.

Findings from the prospective study—the first believed to link sleep irregularity to the development of CVD—were published online Mar. 2 in the *Journal of the American College of Cardiology*.



Older adults with irregular sleep patterns are nearly twice as likely to develop cardiovascular disease as those with more regular sleep patterns, according to a new study.

IMAGE: RIDOFRAZ/ISTOCK

“We hope that our study will help raise awareness about the potential importance of a regular sleep pattern in improving heart health. It is a new frontier in sleep medicine,” said lead study author Dr. Tianyi Huang, an epidemiologist with the Channing Division of Network Medicine at Brigham and Women’s Hospital in Boston.

“Research has linked irregular sleep schedules to a constellation of disease-causing abnormalities in body function, including changes in blood sugar and inflammation,” added Dr. Michael Twery, director of NHLBI’s National Center on Sleep Disorders Research. “This study is important because it is among the largest of its kind and it specifically associates these irregular sleep patterns with an increased risk for cardiovascular disease.”

Previous studies have linked insufficient amounts of sleep to a higher risk of obesity, diabetes and heart disease, which is why doctors emphasize

the importance of getting 7 to 8 hours of sleep per night. Although researchers have suspected that high day-to-day variability in sleep duration and timing might also have negative effects on heart health, its effect remained unclear.

The association between irregular sleep and CVD appeared stronger among racial/ethnic minority populations, particularly African Americans, than among whites, the researchers said. This finding is consistent with recent studies that show racial minorities tend to have a higher risk of sleep disorders than whites. Although past studies suggest that women are more likely than men to be affected by unhealthy sleep, the current study did not find significant gender differences.

The researchers said they are unclear about the exact biological mechanisms behind the sleep irregularity and CVD link, but they suspect that multiple factors, including harmful disturbances in the body’s circadian rhythm—the 24-hour internal body clock that controls the sleep-wake cycle—may be in play.

HPV Vaccine Safely Evokes Immune Response in Women Who Had Stem Cell Transplant

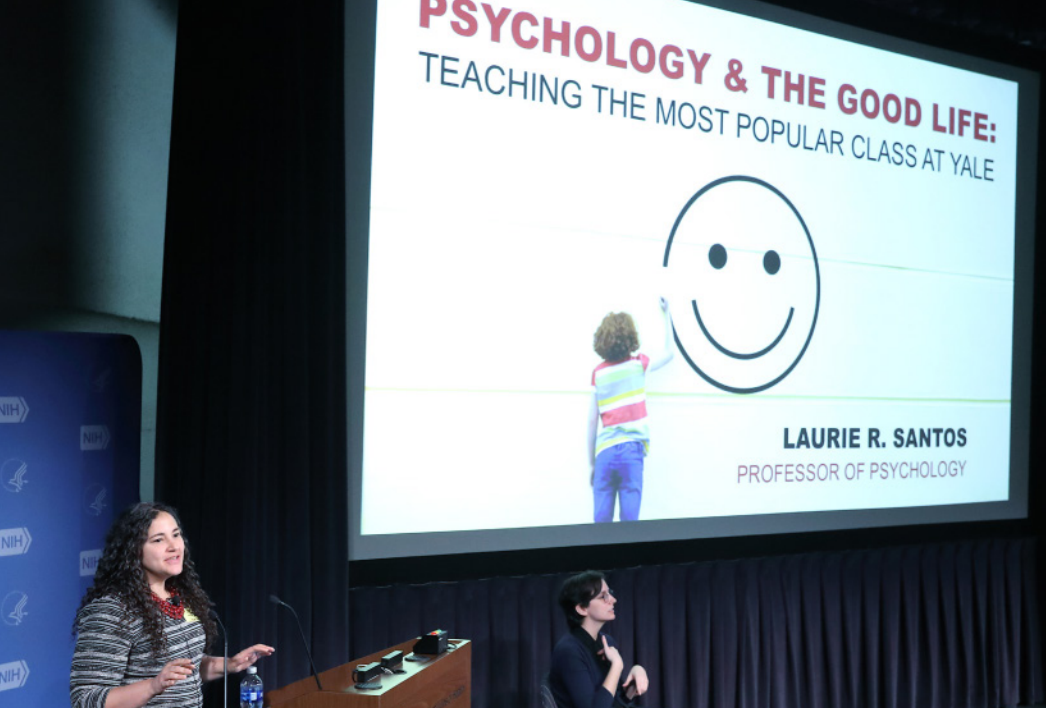
The human papillomavirus (HPV) vaccine provides a safe, robust immune response against HPV in reproductive-aged women who have had a stem cell transplant. This was shown by a small study that enrolled 64 women participating in the Intramural Research Program at NHLBI, NCI and other institutes at the Clinical Center.

The results, published Feb. 27 in the *Journal of the American Medical Association Oncology*, suggest that the vaccine may help prevent against new HPV infections and associated cervical, vulvar and other HPV-related cancers in women with a donor-acquired immune system.

All women received the first-generation FDA-approved quadrivalent HPV vaccine—which protects against two high-risk and two low-risk HPV types—three times on the first day, and at 2 and 6 months.

After measuring the women’s immune responses to vaccination, researchers found that 78 percent of women receiving immunosuppressants, 95 percent of those off immunosuppression and 100 percent of the healthy volunteers developed an antibody response to all four HPV vaccine types.

Five of the 8 participants who had previous treatment with the drug rituximab, which researchers described as being known to hinder responses to vaccines, still mounted an immune response to the HPV vaccine. The side effects from the HPV vaccine were mild and did not differ across all groups of women.



Santos' class at Yale got so large it had to relocate first to the campus chapel, then to a concert hall.

PHOTOS: CHIA-CHI CHARLIE CHANG

Happiness

CONTINUED FROM PAGE 1

ago, Dr. Laurie Santos, who has taught psychology at Yale for 17 years, began teaching a class on happiness—Psychology & the Good Life—that quickly became the university's most popular class ever. She gave NIH'ers a crash course at a Feb. 6 Deputy Director for Management Seminar, speaking to an enthusiastic, packed crowd in Lipsett Amphitheater.

Santos recognized the need for such a class after becoming head of Yale's Silliman College. Living among students, she began observing an alarming trend confirmed in national surveys: a growing number of college students report feeling depressed, anxious, lonely, overwhelmed, even hopeless, much of the time.

"We have a scientific approach to how we can solve this mental health crisis and, in particular, how we can promote well-being in the trenches for these students," said Santos. "These aren't viruses or test tubes...but it is a scientific approach."

The science is based on social experiments in which researchers find very happy people to study.

"You can find them; they're out there, even living in the D.C. metro area," Santos said to laughter. Now, two decades worth of studies help validate the happiness strategies she teaches.

The demand for a happiness class should've come as no surprise to Santos,

though enrollment exceeded all expectations. Nearly 800 students registered for the new class, and that number soon swelled to 1,200. The class got so large, it had to relocate first to the campus chapel, then to the concert hall.

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"The more materialistic you get, the less happy you become."

-DR. LAURIE SANTOS

★ ★ ★

"[Its popularity] shows that students don't like this culture of feeling anxious and overwhelmed," Santos said, "and they really wanted an evidence-based approach to do something about it and take different kinds of actions."

In the class, Santos teaches the science behind the good life with a twist on requirements, what she calls "rewirements"—practices that can rewire our habits such as savoring the moment, expressing gratitude and experiencing social connections. Her happiness-boosting tips are straightforward, though she admits they can also seem intimidating. The benefit comes from consistently putting them into practice, she said, a realization among her students that inspired the Twitter handle #hardestclassatYale.

Misconceptions about happiness

Before we can rewire our habits, said Santos, we need to retrain our brains, which often are lying to us about what really makes us happy.

Most people assume that more money would make them happier. When researchers ask what salary would make them content, regardless of earnings, respondents say they'd need more.

"You never get to the goal but, more insidiously, the goal gets further away as you get more money," said Santos. "The more materialistic you get, the less happy you become."

Another hindrance to happiness is what Santos calls "the *G.I. Joe* fallacy." The 1980s action hero would say at the end of every cartoon episode, "Knowing is half the battle." Knowledge is a start, said Santos, but knowing what we should do doesn't necessarily translate into action.

We all have an opportunity to take charge of our happiness, since less than half of our well-being is inherent.

"A decent chunk of our happiness comes from the stuff we can control," said Santos. We can change our attitudes, behaviors and mindsets but, as with most worthwhile things in life, it will take consistent effort.

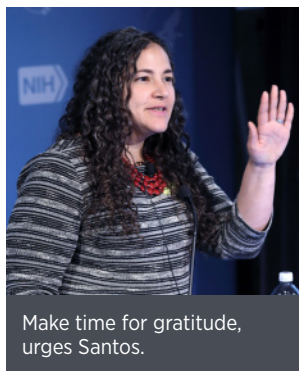
Take action to be happy

Make time for social connections, urged Santos.

"Talking to the barista at the coffee shop, making an effort to connect more in real life with your [colleagues] and prioritizing time with family and friends can promote well-being," she said. "Even introverts get exactly the same magnitude of positive effect when they actually talk to people."

Studies also show that giving is the gift that keeps on giving. Whether the deeds are big or small, helping others—volunteering your time, buying someone a gift or donating to charity—can increase your happiness.

Make time for gratitude, advised Santos, who asks her students to keep a gratitude journal. Jotting down a few things you're grateful for daily can dramatically improve well-being as does expressing it to others. For homework, she assigns the gratitude visit. Write a letter of gratitude and deliver it in person. It's a note the recipient will cherish and the act can boost your own happiness for months.



Make time for gratitude, urges Santos.

It's time for your midterm exam. How does expressing gratitude improve well-being?

"If you tell someone you're thankful for them, first, you have to have

a social connection," said Santos. "Second, you're doing something nice for somebody else...and you're feeling the gratitude inside when you're expressing it."

One insight won't surprise most NIH'ers.

Physically healthy practices such as regular exercise and enough sleep make us happier.

"I think we could solve a lot of the college students' mental health crises on campuses if we just got our students to sleep [more]," said Santos.

Another happiness tip: Be in the present moment. "Notice what it feels like to be you, in your body, right now," she said.

Researchers estimate people self-report mind-wandering about half the time, which means people often aren't paying attention. Savor the moment, Santos said. Relish that treat; notice your emotions. Research shows that a few minutes of daily meditation can change the brain regions involved in mind-wandering.

And, be wealthy, said Santos, not necessarily in money, but in time. Happier people prioritize having a little more time, she said. In fact, when Santos once cancelled her class as an experiment, one student burst into joyful tears, saying it was her first free hour all semester.

If we decided to devote our time to pursuing only one happiness strategy, asked Dr. Alfred Johnson, NIH deputy director for management, which should we try? The one that's best for you, said Santos, is the one you're not already doing.

"Try the one you thought was going to be hardest," she advised. "That's going to be your biggest boost." **B**



VRC deputy director Dr. Barney Graham (l) and Dr. Kizzmekia Corbett, VRC coronavirus vaccine lead, discuss research on the virus with several U.S. legislators representing Maryland. They are (clockwise from top) Sen. Chris Van Hollen, Sen. Benjamin Cardin and Rep. Jamie Raskin. Below, the delegation gets a slideshow presentation on the coronavirus situation.

Congressional Delegation Gets Coronavirus Update

PHOTOS: CHIA-CHI CHARLIE CHANG

Three days after the President visited the Vaccine Research Center for an update on coronavirus research, two senators and one congressman

representing Maryland paid their own call on the VRC for a similar briefing.

On Mar. 6, Sen. Chris Van Hollen, Sen. Benjamin Cardin and Rep. Jamie Raskin, all Democrats, got an hour-long orientation to the VRC hosted by NIH principal deputy director Dr. Lawrence Tabak and VRC director Dr. John Mascola.

Mascola, VRC deputy director Dr. Barney Graham and Dr. Kizzmekia Corbett, VRC coronavirus vaccine lead, provided an overview of the facility and its role in the discovery of new vaccines for

emerging and reemerging diseases, with a focus on the recent vaccine development effort for SARS-CoV-2, which causes COVID-19 disease.

Also participating were Dr. Julie Ledgerwood, deputy director and VRC chief medical officer, and Dr. Kaitlyn Morabito, project manager and science analyst in the Viral Pathogenesis Laboratory.



VOLUNTEERS

Patients with Colorectal Cancer Sought

Do you or someone you know have colorectal cancer? Have previous treatments failed? Researchers at the Clinical Center are testing whether pexastimogene devacirepvec (Pexa-Vec), given in combination with durvalumab, will cause tumors to shrink. Pexa-Vec is a vaccine used to help boost the immune system to attack and destroy the cancer cells in patients. Treatments and research procedures are provided at no cost. Travel may be provided. For more information call 800-411-1222 (TTY 800-877-8339) or email prpl@cc.nih.gov. Refer to study 17-C-0092. Read more at <https://go.usa.gov/xpvP3>.

Women with PCOS Sought

NIDDK seeks women 18-40 with polycystic ovary syndrome (PCOS) to participate in a research study. Researchers are studying a type of body fat called brown fat and the role it plays in how we burn energy. Participation includes taking a medication daily for 4 weeks, 2 overnight inpatient stays for testing and 2 outpatient visits. Compensation is provided. For more information, contact the Clinical Center Office of Patient Recruitment at 866-444-2214 (TTY 800-877-8339) or prpl@cc.nih.gov. Refer to study 17-DK-0054. Read more at <https://go.usa.gov/x5Mmj>.

Menopause & Mood Study

A 7-week outpatient study is accepting post-menopausal women ages 45 to 65 who struggled with irritability, anxiety, sadness or depression during perimenopause and had symptoms that improved with the use of hormones. There is no cost to participate. Compensation is provided. To learn more about the study call (301) 496-9576 (TTY 1-866-411-1010) or visit <https://go.usa.gov/xPkKB>. Refer to study 18-M-0144.

After 40 Years, Kleinerman Retires from NCI

Dr. Ruth Kleinerman, staff scientist and deputy chief in the Radiation Epidemiology Branch (REB) retired from NCI's Division of Cancer Epidemiology and Genetics (DCEG) recently after 40 years of federal service.

She is widely recognized for her work in second cancers following treatment for retinoblastoma, a rare malignant tumor of the eye that occurs in childhood.

Kleinerman collaborated with Memorial Sloan Kettering Cancer Center and the University of Massachusetts Medical Center

to follow a large cohort of adult survivors of retinoblastoma to describe radiosensitivity and risk of second cancers among patients with the hereditary form of the disease.

This work influenced clinical practice to reduce the use of radiation to treat these children and was recognized with an NIH Merit Award and two NCI DCEG awards for outstanding research paper by a staff scientist. In addition to documenting her findings in the scientific literature, Kleinerman created newsletters and a website to communicate results to participants and families. She won two NIH Plain Language Awards for her clear and effective writing.

In addition to her research on retinoblastoma, Kleinerman contributed to many other studies of second cancers. Her early research included investigations on long-term effects of curative radiotherapy for cervical cancer, benign gynecological disease and peptic ulcers.

In addition to reporting dose-response relationships for over a dozen cancer sites, results from these studies demonstrated the potential to investigate second cancer risk from a range of radiation exposures. She also contributed to the first comprehensive mortality study in physicians conducting fluoroscopically guided interventional procedures, which reported an increased risk of leukemia in radiologists who graduated before 1940. She also helped launch a large international study on the risk of second cancers following proton therapy versus photon therapy in pediatric cancer patients.

Kleinerman also collaborated on studies of environmental exposure to ionizing and nonionizing radiation. She was involved in the NCI-Children's Oncology Group case-control study to address public health concerns about electromagnetic



Dr. Ruth Kleinerman

fields generated by power lines, a study that found no association between living near high-voltage power lines and risk of childhood acute lymphoblastic leukemia. She organized a large case-control study of radon and lung cancer in cave dwellers in China that included evaluation of other exposures such as cooking oil mutagenicity. Research on cooking fuels and indoor air pollution continues within the division and has been shown to be a significant risk factor for lung cancer among never-smoking women.

In addition to her research, Kleinerman was central to the administrative functioning of REB, serving as the project officer for research support contracts and interagency agreements. She was also a dedicated mentor who received a DCEG Outstanding Mentor Award.

Kleinerman joined NCI as an epidemiologist in 1979 after receiving her M.P.H. from Boston University. In 2016, she received a doctorate in public health from the University of London, U.K.

In retirement, she will serve as a special volunteer to the division.

NIA'S Barr, Extramural Director, Ends Long Career

Dr. Robin A. Barr, director of NIA's Division of Extramural Activities (DEA), retired from federal service on Jan. 31 after 33 years with the institute.

A native of Scotland, Barr received his undergraduate and doctoral degrees in psychology from the University of Oxford, England. After postdoctoral work at the University of Pennsylvania, he joined the faculty of Ball State University in Indiana in the department of psychological sciences, where his research on attention and aging was supported by NIA.



Dr. Robin A. Barr

"When I first met Robin, I was struck by his presence and gravitas," said Dr. Marie Bernard, deputy director of NIA. "He represented

us so well and was the go-to person for both formal and informal advice. We will truly miss his enormous contributions to NIA."

In 1987, Barr joined NIA as a program administrator in the Behavioral and Social Research Program, overseeing a portfolio on aging and cognition. He helped to develop the institute's human factors initiative and research focused on older drivers. He also helped establish the Roybal Centers of Research on Applied Gerontology and worked to develop the institute's initiative on

cognitive interventions to improve functioning in older adults.

Barr was named deputy head of DEA and NIA training officer in 1994. He oversaw training initiatives, anticipated the need for new kinds of training and worked with NIH peers to steer overall research training policy. He led efforts to substantially expand NIA's career development awards program.

In 2006, Barr was named acting director of DEA, and in 2007, he was appointed DEA director. He focused on shaping NIH's policies toward new and early-stage investigators and managed NIA's National Advisory Council on Aging. In 2014, he became founding editor of the NIA blog for the extramural community. He also served on multiple NIH committees focused on research training and early-career researchers and helped develop the NIH Pathway to Independence Award (K99/R00) and the Early-Stage Investigator designation.

In recent years, as NIA received a substantial infusion of funds for Alzheimer's disease research, Barr led new approaches aimed at expanding the field rapidly, including guiding the creation of an administrative supplement program to stimulate research in this area. To date, NIA has made more than 600 supplemental awards to grants overseen by all other NIH institutes and centers.

In wishing him well on his retirement, NIA director Dr. Richard Hodes said, "Robin was a leader who helped us understand the challenges we face, and most importantly, the solutions to them. We could not have accomplished all we did through these recent years of expansion in both the size and quality of work at NIA without Robin's leadership."

"In all my years here, I have had true pleasure in both learning from and aiding our growing field of aging research," said Barr. "Working with staff in my own division, across the institute and across NIH has allowed achievements that we can all be proud of. If I am remembered here for anything, I hope it is that my actions always served the goal of developing our field for the benefit of our broader community."

Barr's retirement plans include working on a book, serving in local government and grandparenting.

Alexander, Former NICHD Director, Dies

Dr. Duane Alexander, a former director of the National Institute of Child Health and Human Development for more than 20 years, died Feb. 16 from Alzheimer's disease. He was 79 years old.

Alexander was a champion for the health and well-being of women, children and people with intellectual and physical disabilities. He spent most of his career at NIH, with much of this time at NICHD. He was NICHD director from 1986 to 2009, during which time he oversaw multiple achievements, including the demonstration of the safety and efficacy of amniocentesis for prenatal genetic diagnosis; the prevention of acquired intellectual and developmental disability caused

by *Haemophilus influenzae* type b meningitis, phenylketonuria and other conditions; the establishment of effective newborn screening programs; the reduction of sudden infant death syndrome (SIDS) rates in the United States; and the launch of the Back to Sleep campaign (now called Safe to Sleep) to educate families about reducing SIDS risk.



Dr. Duane Alexander (circa 2008) served as NICHD director for more than 20 years.

Alexander presided over efforts that led to the near elimination of maternal-to-child transmission of HIV in the United States, the prevention and correction of neural tube defects such as spina bifida and the identification of the underlying bases for Fragile X and Rett syndromes. His advocacy for people with disabilities also helped to establish the National Center for Medical Rehabilitation Research within NICHD.

Born in Baltimore in 1940, Alexander grew up in Annapolis. After graduating from Pennsylvania State University in 1962, he earned his medical degree from Johns Hopkins University School of Medicine.

Following an internship and residency in pediatrics at Johns Hopkins Hospital, he joined NICHD in 1968 as a commissioned officer in the Public Health Service and a clinical associate in the Children's Diagnostic and Study Branch. He returned to Johns Hopkins as a fellow in pediatrics (developmental disabilities) at the John F. Kennedy Institute for Habilitation of the Mentally and Physically Handicapped Child, known today as the Kennedy Krieger Institute.

Alexander's interests brought him back to NICHD in 1971, when he became assistant to the scientific director and led the NICHD National Amniocentesis Study.

From 1974 to 1978, he served as medical officer in the Office of the Assistant Secretary for Health in what is now the Department of Health and Human Services. During that time, he was also a physician on the staff of the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, whose recommendations form the basis of current HHS regulations that protect human subjects in research. He served as NICHD deputy director starting in 1978 and was acting director for a time before becoming NICHD director in 1986.

For more than a decade, he also served as the United States' observer on the steering committee on bioethics for the Council of Europe.

After leaving NICHD, Alexander went to the Fogarty International Center, where he served as an advisor to the director on global maternal and child health issues.

He received numerous awards for his leadership and work in public health. For his PHS efforts, he received a Commendation Medal, a Meritorious Service Medal, a Special Recognition Award and the Surgeon General's Exemplary Service Medal. He retired from the PHS after 31 years with the rank of assistant surgeon general (rear admiral). Alexander also received the Arnold J. Capute Award from the American Academy of Pediatrics and the Dr. Nathan Davis Award for Outstanding Government Service from the American Medical Association.

A farmer in his spare time, Alexander would often share fruits and vegetables grown on his Ellicott City, Md., farm with NICHD staff. He was also fond of ice cream from the Berkey Creamery at Penn State and would import it to the Bethesda campus for special occasions. He enjoyed music (he was a tuba player), reading, nature and travel and was devoted to his family—wife Marianne, a son and daughter, their spouses and his three grandsons.



Longtime NIH researcher Dr. Ida Stephens Owens was the first African-American woman to earn a doctoral degree from Duke University.

Owens, Longtime NICHD Scientist, Mourned

Longtime NIH investigator Dr. Ida Stephens Owens died Feb. 24 at the age of 80. She was the first African-American woman to earn a doctoral degree from Duke University, in 1967, and was internationally known for her contributions to the understanding of the genetics of drug metabolism.

Born in 1939 in Whiteville, N.C., Owens earned her bachelor of science degree in biology from North Carolina College, now North Carolina Central University, in 1961. She began her Ph.D. studies in biochemistry and physiology a year later. At the time, Duke had just started racially integrating its graduate and professional schools. She was among the first three African-American graduate students to enroll.

After earning her Ph.D., Owens came to NIH in 1968 as a fellow in the Laboratory of Biochemistry and Metabolism in what was then the National Institute

of Arthritis, Metabolic and Digestive Diseases. She then joined NICHD for a second fellowship in the section on developmental pharmacology in the Laboratory of Biomedical Sciences.

In 1975, Owens started her own laboratory at NICHD, the section on drug biotransformation, later renamed the section on genetic disorders of drug metabolism. She retired from NIH in 2017.

In her nearly five decades at NIH, Owens made several major advances in the study of a critical group of enzymes called UDP-glucuronosyltransferases (UGTs), which are responsible for detoxifying numerous drugs, toxic chemicals and other substances.

She designed methods to study genes that code for specific UGTs, allowing her to characterize UGT1A1, the gene for an enzyme that processes the protein bilirubin, a breakdown product of hemoglobin. She also identified 12 previously unknown and independent UGT enzymes.

Owens identified a genetic defect in the gene UGT1A1 that leads to Crigler-Najjar syndrome, a disorder that disrupts normal processing and excretion of bilirubin, leading to jaundice. She also found that UGT enzymes must be activated before they can detoxify foreign chemicals and that, in some cases, suppressing these enzymes could enhance the effects of therapeutic drugs.

She is survived by her husband Herbert Owens, son Jeffrey Owens, daughter Lisa Owens, son-in-law Darryl Settles, and grandchildren Taylor and Preston Settles, as well as her sister Gwendolyn Bradley and brother Benjamin Stephens. **R**

FEEDBACK

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

Feedback: The rumor mill is going and the word is that NIH has COVID-19 patients at the Clinical Center. If it's true, then NIH should notify its employees. If it's false, then say so. I don't mind if we do have COVID-19 patients, but I think NIH needs to be transparent.

Response from the Office of Communications and Public Liaison: The Clinical Center does not have, and has not had, any patients with known COVID-19 infection. The hospital is equipped and prepared to accept patients with COVID-19, if needed, but is not scheduled to receive patients at this time (3-13-20). NIH will inform staff ahead of receiving such patients.



First lady Melania Trump returned on Feb. 14 to the Children's Inn at NIH to celebrate Valentine's Day.

First Lady Spends Third Valentine's Day at Inn

PHOTOS: CHIA-CHI CHARLIE CHANG

First lady Melania Trump celebrated her third Valentine's Day on Feb. 14 with youngsters staying at the Children's Inn at NIH. Over the past year, she has also invited inn families to participate in the White House's annual Easter Egg Roll, Christmas tree-lighting ceremony, Halloween celebration and the 1-year anniversary of her Be Best campaign.

"We are so honored that the first lady has chosen to spend Valentine's Day with the children and families of the Children's Inn once again this year," said Jennie Lucca, inn CEO. "We look forward to her visit every year. Mrs. Trump's visit not only brings a delightful



Trump speaks with Amber Negrete (l), 10, of San Jose, Calif., who is participating in an NIH gene therapy trial for giant axonal neuropathy, a rare genetic disease.

experience for our families but also awareness to the much-needed medical research happening at NIH that's helping the seriously ill children we serve every day."

The first lady joined a group of children participating in activities such as cookie decorating, card- and wreath-making, painting canvas bags, and more. Trump also exchanged Valentine's Day cards with the children and made brief remarks, encouraging the children to stay strong.

"The first lady was very, very, very sweet," said Elly, 7, of Albuquerque, New Mexico, whose brother is participating in an NIH clinical trial. "She asked how my brother was feeling. I taught her how to do the heart craft."



Trump speaks with children including Amana Kadu (second from l), 9, of Mombasa, Kenya, while working on crafts. Amana donated cells to her brother so he could undergo a life-saving stem cell transplant that cured him of sickle cell disease.



Trump receives flowers from Thais Fernandez Carranza, 8, of Lima, Peru. Carranza, who has Proteus syndrome, is participating in a clinical study at NIH.



Trump speaks with Children's Inn resident Oluwadamilola "Princess" Adeniran, 7, of Nigeria, who is participating in an NCI clinical trial. The two decorated cookies together.



Trump poses with (from l) Children's Inn board member Susan Penfield, chief innovation officer and strategic innovation group lead at Booz Allen Hamilton; Children's Inn CEO Jennie Lucca; and NIH principal deputy director Dr. Lawrence Tabak.