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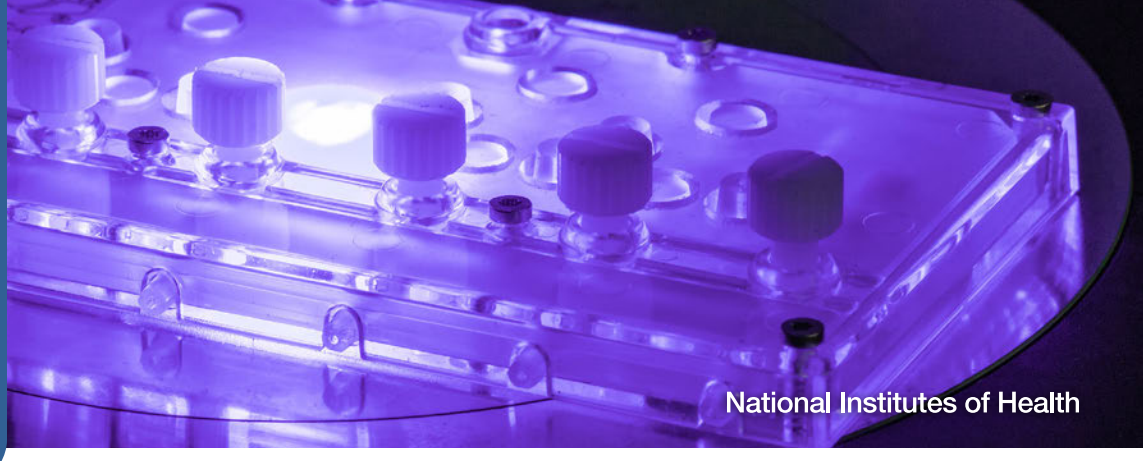


SIXTH INTRAMURAL LAUREATE

NIH's Alter Wins Nobel Prize

BY RICH MCMANUS

When the phone rang at 4:15 a.m. on Oct. 5 at Dr. Harvey Alter's house, he ignored it.

"It got me out of a deep sleep, and woke my wife, too, but we decided not to answer it," he said.

Five minutes later, it rang again, and the Alters once again blew it off.

"It rang a third time, and I got out of bed rather angrily, figuring it was either a political solicitation or an offer to extend the warranty on my car," he said. "But it was a man from Stockholm. It left me dead in my tracks."

Alter learned he had won the 2020 Nobel Prize in Physiology or Medicine for his contributions to the discovery of the hepatitis C virus. He shares the award with longtime NIH grantee Dr. Charles M. Rice of Rockefeller University and Dr. Michael Houghton of the University of Alberta.

Dr. Harvey Alter, senior scholar at the Clinical Center, won the 2020 Nobel Prize in Physiology or Medicine.

"I'm really humbled by this whole event," said Alter at a 10 a.m. conference call with reporters, during which he reviewed a half-century of work that he called "a tribute to non-directed research...You don't know where you're going, but you just keep going."

"This is a source of great joy and pride," said NIH director Dr. Francis Collins, who opened the telebriefing. "In a career of more than 50 years at the Clinical Center, Dr. Alter has done work that is not just beneficial, but now curative...He is the perfect person for this honor—persistent, dedicated, creative. He cares deeply about saving lives. We are just thrilled."

"This is a great day for the NIH Clinical Center," said hospital CEO Dr. James Gilman, "and a great day for science...

SEE **NOBEL**, PAGE 4

'Little by Little' Supports Habit Formation, Says Kim

BY ERIC BOCK

Michael Kim

Most of us have heard the "pernicious and insidious" myth that it takes just 21 days to form a new habit or change a behavior, said Michael Kim, founder & CEO of Habit Design, the first habit coaching company to be awarded an NIH Small Business Innovation Research Fast Track grant.

"Based on the latest clinically validated

SEE **KIM**, PAGE 8

NIDDK Celebrates 70 Years of Improving Public Health

BY LISA YUAN

For 70 years, the National Institute of Diabetes and Digestive and Kidney Diseases has been charged with tackling some of the country's most serious health problems. And for 70 years, NIDDK staff and grantees have risen to the challenge, bringing talent and dedication to improve prevention, treatment and management of the conditions in the institute's broad mission.

"The diseases we study cut across the full spectrum of medicine," said NIDDK director Dr. Griffin Rodgers. "Since its inception in 1950, NIDDK has conducted and supported innovative research that has helped save lives, enhance quality of life and pave the way for future discoveries—discoveries that will continue to improve our nation's health."

For example, research advances in diabetes have led to easier and more precise

SEE **ANNIVERSARY**, PAGE 6

NIH'ers share photos of nature; see back page.

ALSO THIS ISSUE

NAPA Honors CIT's Norris

Andrea Norris, director of the Center for Information Technology and NIH's chief information officer, was among 45 new members elected to the National Academy of Public Administration (NAPA). Induction of the new fellows will occur during the academy's annual fall meeting, which will take place virtually Nov. 5-10.

Selection of new fellows follows a rigorous review of the individual's contributions to the field of public administration and policy.

Andrea Norris

The 2020 class joins more than 940 academy fellows, including former cabinet officers, members of Congress, governors, mayors and state legislators, as well as prominent scholars, business executives, nonprofit leaders and public administrators.

Chartered by Congress to provide non-partisan expert advice, NAPA is an independent, non-profit and non-partisan organization established in 1967 to assist government leaders in building more effective, efficient, accountable and transparent organizations.

NIH Labs Win 2020 International Freezer Challenge Award

The International Institute for Sustainable Laboratories (I2SL) hosts an annual freezer challenge (www.freezerchallenge.org) in which thousands of labs from private companies, universities and government organizations compete to see who can reduce the most energy consumed by the freezers in their labs.

Four NIH labs competed in the 2020 I2SL Freezer Challenge. Through their combined efforts, NIH won the challenge in the government organization category. Also, the NCI Laboratory of Cell Biology, led by NIH deputy director for intramural research Dr. Michael Gottesman, won the challenge in the individual government laboratory category.

The NCI Laboratory of Cell Biology, led by Dr. Michael Gottesman (c), won a prize in the freezer challenge.

A ULT freezer

The other three labs that participated are: NCI Laboratory of Human Carcinogenesis, NHGRI reproductive cancer genetics section and NIDDK genetics and metabolism section, within the Liver Disease Branch.

A few of the notable initiatives they completed include: discarded 18,356 1.5-ml samples; retired 12 freezers; and changed the temperature setting from (-80°C) to (-70°C) on 21 ultra-low temperature (ULT) freezers. Their combined efforts will save NIH an estimated 134,681 kWh/year, $14,815/year and 56.6 $MTCO_2e$ greenhouse gas emissions/year.

More information is detailed in the 2020 Freezer Challenge results page at https://nems.nih.gov/programs/Pages/2020-Freezer-Challenge-Results.aspx.

To sign up for the 2021 freezer challenge, visit https://orfweb.od.nih.gov/sites/dep/freezer-challenge/lists/Freezer_Challenge_Sign_Up/NewForm.aspx.

Youle Receives 2021 Breakthrough Prize in Life Sciences

Dr. Richard Youle, a senior investigator at the National Institute of Neurological Disorders and Stroke, is one of four recipients of the 2021 Breakthrough Prize in Life Sciences.

The Breakthrough Prizes were started in 2012 to "honor important, primarily recent, achievements in the categories of fundamental physics, life sciences and mathematics." Youle will receive a $3 million award "for elucidating a quality control pathway that clears damaged mitochondria and thereby protects against Parkinson's disease." Previously, laureates were also honored with a televised, Oscar-style award show. Due to the Covid-19 pandemic, this year's ceremony has been postponed until March 2021.

Youle leads a team of researchers that studies how genetic mutations may cause Parkinson's disease. About 500,000 Americans are currently diagnosed with Parkinson's disease. The Breakthrough Prize honors discoveries made by the Youle lab that show how certain disease-causing mutations in genes called PINK1 and Parkin may harm the brain. Their results suggest that the mutations may be linked to a breakdown in the way brain cells dispose of damaged powerplants, called mitochondria. The results have helped researchers not only understand the role the genes play in the healthy and diseased brain but also explore new treatment ideas for Parkinson's disease and other disorders that are linked to damaged mitochondria.

Dr. Richard Youle

Youle has served NIH since 1978. Over the years, he has studied a wide range of subjects including the immunology of bone marrow transplantation, therapies for brain tumors and programmed cell death.

Before arriving at NIH, he received an A.B. from Albion College and a Ph.D. from the University of South Carolina. He has trained dozens of scientists, published more than 180 peer-reviewed research articles and has been awarded 16 patents. He also received several awards, including three NIH Director's Awards.

Dr. Nora Volkow

Volkow on List of '10 Hispanic Pioneers in Medicine'

In celebration of National Hispanic Heritage Month, the Association of American Medical Colleges honored NIDA director Dr. Nora Volkow as one of the top 10 Hispanic pioneers in medicine.

A prolific researcher—she has published more than 780 peer-reviewed papers—Volkow has led the National Institute on Drug Abuse since 2003.

Her work on addiction is personal. A beloved uncle was ostracized because of his alcoholism and her grandfather had been an alcoholic and died by suicide. "Drug addiction is a disease," she says.

To learn about the company she joins, visit www.aamc.org/news-insights/celebrating-10-hispanic-pioneers-medicine.

NIEHS History Comes Alive with Postcards

BY JOHN YEWELL

NIEHS and the Durham, N.C., community recently were treated to an online tour of their common past. John Schelp, special assistant for community engagement and outreach in the institute's Office of Science Education and Diversity (OSED), narrated "Postcards from Durham," a 3-part history series.

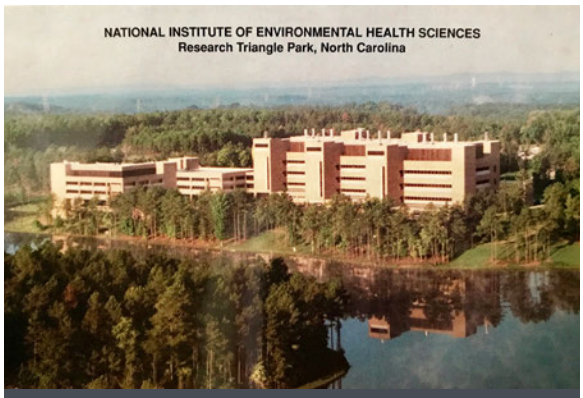
He covered the beginnings of Research Triangle Park (RTP) and the effects of NIEHS coming to the Tar Heel State, among other topics. Schelp used postcards from his private collection to enhance the learning experience. Preservation Durham and the Museum of Durham History sponsored his presentations.

John Schelp

PHOTO: STEVE MCCAW

The story begins with an April 1960 meeting between Robert Kennedy, brother of the future president, and Terry Sanford, then a former state senator running for governor, at the College Inn in Raleigh. At the Democratic convention 3 months later, Sanford endorsed John F. Kennedy, who carried North Carolina and won the election.

"We don't know what was discussed in that April meeting, but whatever goodwill the endorsement earned Sanford bore fruit 4½ years later," said Schelp.



"This postcard doesn't indicate a date, but it is most likely pre-1992," said Schelp.

In January 1965, a federal committee recommended that NIH build its new environmental health sciences center in RTP. On Gov. Sanford's last day in office, he and the U.S. surgeon general shared the news publicly.

Schelp shared a postcard of the College Inn, where Sanford met Kennedy.

"NIEHS was the first major organization to announce they were coming to RTP," said Schelp. "IBM announced 6 weeks later and started building first. That one-two punch transformed the area into an economic engine of North Carolina. Others were here, but they were smaller at the time."

This early 20th century postcard draws attention to educational institutions open then in Durham.

A 509-acre parcel was designated as the future home of what is now NIEHS. Construction began in 1977, and the new campus welcomed its first scientists in 1983.

Schelp's passion for Durham history began when he moved to town and purchased a Sears and Roebuck home that had been used as a parsonage for the West Durham Church of God. "From there, my interest expanded to my former mill village neighborhood and then to the rest of the city," he said.

The year 2020 marks Schelp's 30th year at NIEHS. "I started as an intern in 1991 and never left," he said. He is well known in Durham for being what he calls a street historian. "I like the term. I don't want to pretend that I'm a Ph.D."

"When John and I began working together, he knew that I was new to the area, and he was quick to offer me a 'windshield tour' of Durham," said OSED director Dr. Ericka Reid. "It was my first introduction to the city's history and how it connects to NIEHS. I always refer to him as 'Mr. Durham' and the institute's resident historian. Our visitors enjoy him very much. He is our absolute go-to for tours and information sessions."

In addition to conducting some 60 NIEHS campus tours each year and showing institute visitors the local area, Schelp gives regular neighborhood walking tours.

"The city has changed so much," he said. "The Duke family used to control 90 percent of the world's cigarettes. Now, it's illegal to smoke on a Durham sidewalk."

Watch his presentation at https://www.youtube.com/watch?v=R1GTFdRh3Ug. R

ON THE COVER: *Kidney on a chip.*

IMAGE: UNIVERSITY OF WASHINGTON, NIH SUPPORT FROM NCATS

The NIH Record

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NIH National Institutes of Health
Turning Discovery Into Health

Nobel

CONTINUED FROM PAGE 1

[Alter] is somebody that everybody at the Clinical Center has not only respect, but also affection, for. He's one of the really good guys, with a sense of humor, approachability and accessibility. I couldn't be prouder of the Clinical Center or the department of transfusion medicine. We are very grateful for having had the chance to get to know him."

"What a treat!" enthused Dr. John Gallin, who directed the CC for much of Alter's career and is now NIH associate director for clinical research. "He is the consummate clinical investigator, a wonderful physician who cares passionately about his patients...I believe that his work could not have been done easily anywhere else in the world."

Alter had planned on a career in clinical medicine when he arrived at the NIH blood bank in 1969. But while working with Nobel laureate Dr. Baruch Blumberg, he found an interesting antigen. "It was the surface coating of the hepatitis B virus," he said, and it proved to be the basis for a test to keep donated blood safe.

The excitement of the discovery changed his career path. He and his blood bank colleagues began following patients after they had undergone open-heart surgery at NIH, because about a third of such patients later developed liver abnormalities resembling hepatitis. The scientists were keen to discover the cause.

For 6 months, they checked on these patients weekly and stored their blood samples.

On hand for a media telebriefing Oct. 5 in Bldg. 1 were (from l) NIH director Dr. Francis Collins, Alter, NIH associate director for clinical research Dr. John Gallin and Clinical Center CEO Dr. James Gilman.

The Royal Swedish Academy of Sciences said, "Prior to their work, the discovery of the Hepatitis A and B viruses had been critical steps forward, but the majority of blood-borne hepatitis cases remained unexplained. The discovery of Hepatitis C virus revealed the cause of the remaining cases of chronic hepatitis and made possible blood tests and new medicines that have saved millions of lives."

PHOTOS: CHIA-CHI CHARLIE CHANG

"We were astounded to find that 30 percent later got hepatitis," said Alter.

Further investigation revealed that, if the patients had received blood from paid donors, they had a 51 percent chance of acquiring hepatitis, versus only a 7 percent chance if the donors were volunteers. So in 1970, the NIH blood bank adopted a policy of all-volunteer donations if patients were to be later transfused. That year, the first test for hepatitis B debuted, causing "a precipitous drop [in post-surgical cases of hepatitis], to 10 percent," said Alter.

But it didn't go to zero. What else was going on?

"In the ensuing years, we didn't know where we were going," he said, but the scientists kept up their search for all causes of post-transfusion hepatitis. In the mid-1970s at NIH, researchers discovered the hepatitis A virus. That enabled Alter and his team to take advantage of the "enormous value of stored samples" to tease out hepatitis cases unrelated to either the A or B forms—and there were a lot of those. They dubbed the culprit "non-A, non-B hepatitis."

"Fifteen years later, we still didn't know what the agent was," he related. But they knew something about it. Animal studies and filtration experiments suggested the agent was a small virus, likely an RNA virus.

"We were still stuck through the 1980s, without having really identified the agent," said Alter. "But then, the field of molecular biology began to emerge...We were upstaged by [co-laureate] Houghton, working at Chiron, when they cloned the non-A, non-B agent," later known as hepatitis C.

The Chiron team developed an antibody assay that Alter put to the test by pitting it against a coded panel of stored blood samples. It found every single case. The test later became even more sensitive, so that by 1997, rates of post-transfusion hepatitis dropped virtually to zero, with no cases since, Alter said.

Co-laureate Rice provided the ultimate proof that this virus was responsible for hepatitis C by recreating its genome in the lab and showing that it could transmit the disease to animals. Years later, investigators at Gilead developed a game-changing drug whose effectiveness is now at almost 100 percent, said Alter. "We can cure almost all carriers. It may be possible even to eradicate this disease in the next decade, even in the absence of a vaccine. A vaccine is still the goal, though."

During a Q&A session with reporters, Alter, 85, acknowledged, "I'm sort of on the downslope of my career" as he finishes work on his longtime cohort of patients. "All of them are cured," he said. "It's so dramatic. It was the greatest thrill, to be involved with the cure of the first patient, then all subsequent patients. I could never have imagined this—not in my lifetime."

He thinks a vaccine will be tough to develop, because the hepatitis C virus "is constantly mutating. You could kill the dominant strain, but another will come up and keep the infection going. It's like HIV in that respect...It's a tough fight. I'm not sure we'll get to a vaccine. But we don't need it to cure patients."

Alter said Blumberg taught him an important early lesson: "If you find something unexpected, keep looking, keep persisting...We were allowed to do research at NIH, to look for something where you didn't know where you were going. It

Co-Nobelists Dr. Michael Houghton (l) and Alter (r) have a long history of sharing research acclaim. Shown here in 2000, they receive the Lasker Award.

couldn't happen anywhere else. You don't apply for a grant and say, 'I want to discover a new virus.' NIH offers the freedom to pursue things without having an immediate effect. Nowadays, it's hard to get funding without an immediate [payoff]. We need to change that dynamic."

Going forward, Alter said, the issues surrounding hepatitis C "aren't really about science. We don't need better drugs, or tests. We need the political will to eradicate it. We need to make drugs affordable. We need the will to do it, and it will take a global effort."

Hepatitis C is still with us, still spreading, especially in the developing world, he warned. "It's mostly shared needle use that keeps it going. We need to help the drug addict population. They should use disposable equipment, if they are still using drugs.

"In the third world," he continued, "we need to teach health care workers not to use needles or vials over again; for them it is an economic issue. Test and treat is the key."

The third 2020 co-Nobelist, Dr. Charles Rice, a longtime NIH grantee, gives the Khoury Lecture at NIH in 2016.

PHOTO: BILL BRANSON

A native of New York City, Alter earned his medical degree at the University of Rochester Medical School and trained in internal medicine at Strong Memorial Hospital and at the University Hospitals of Seattle. In 1961, he came to NIH as a clinical associate. He then spent several years with Georgetown University before returning to NIH in 1969 to be a senior investigator in what became the Clinical Center's department of transfusion medicine. He later became chief of DTM clinical studies and associate director of research in the department. His current title there is senior scholar.

In 2000, Alter was awarded the Clinical Medical Lasker Award. In 2002, he became the first Clinical Center scientist elected to the National Academy of Sciences. That same year, he was elected to the Institute of Medicine. In 2013, Alter was honored with the Canada Gairdner International Award for his critical contribution to the discovery and isolation of the hepatitis C virus.

Alter is the sixth NIH intramural scientist to win the Nobel Prize, which had not gone to a campus investigator since Dr. Martin Rodbell won in 1994. The other intramural laureates are Dr. D. Carleton Gajdusek (1976), Dr. Christian B. Anfinsen (1972), Dr. Julius Axelrod (1970) and Dr. Marshall W. Nirenberg (1968).

Alter's co-laureate Rice has received continuous NIH funding since 1987, totaling more than $67 million, primarily from the National Institute of Allergy and Infectious Diseases.

For more on the prize, visit https://www.nobelprize.org/prizes/medicine/2020/press-release/.

Grantee Shares Nobel Prize in Chemistry

Dr. Jennifer Doudna, a biochemist with the University of California, Berkeley, and a genome editing pioneer, has received the 2020 Nobel Prize in Chemistry "for the development of a method for genome editing." She has had continuous NIH funding since 1997 from NIGMS, NIAID and NHGRI.

She shares the honor with Dr. Emmanuelle Charpentier, a French microbiologist and a fellow genome editing pioneer with the Max Planck Unit for the Science of Pathogens, Berlin, Germany.

According to the Royal Swedish Academy of Sciences, Doudna and Charpentier "have discovered one of gene technology's sharpest tools: the CRISPR/Cas9 genetic scissors. Using these, researchers can change the DNA of animals, plants and microorganisms with extremely high precision. This technology has had a revolutionary impact on the life sciences, is contributing to new cancer therapies and may make the dream of curing inherited diseases come true."

Dr. Jennifer Doudna of the University of California, Berkeley, is shown here giving the annual NIH Director's Margaret Pittman Lecture on Mar. 11, 2015.

PHOTO: BILL BRANSON

"There is enormous power in this genetic tool, which affects us all," said Claes Gustafsson, chair of the Nobel committee for chemistry. "It has not only revolutionized basic science, but also resulted in innovative crops and will lead to ground-breaking new medical treatments."

Doudna joined Collins for a live ½-hour Q&A session on social media the day following the Nobel announcement. Topics ranged from covid applications for CRISPR to its ethical uses.

The academy continued, "Since Charpentier and Doudna discovered the CRISPR/Cas9 genetic scissors in 2012, their use has exploded. This tool has contributed to many important discoveries in basic research, and plant researchers have been able to develop crops that withstand mould, pests and drought. In medicine, clinical trials of new cancer therapies are underway, and the dream of being able to cure inherited diseases is about to come true. These genetic scissors have taken the life sciences into a new epoch and, in many ways, are bringing the greatest benefit to humankind."

Dozens of NIH-supported scientists from around the world have received Nobel prizes for their groundbreaking achievements in physiology or medicine; chemistry; physics; and economic sciences. To date, 163 NIH-supported researchers have been sole or shared recipients of 96 Nobel prizes.

Anniversary

CONTINUED FROM PAGE 1

ways for monitoring blood glucose (blood sugar), a critical—but often burdensome—component of disease management.

In 1999, NIDDK-supported research led to the first FDA-approved continuous glucose monitor (CGM), enabling people to track glucose levels in real-time without the need for finger pricks.

Today, scientists have taken the CGM a step further with the development of artificial pancreas systems that integrate automated blood glucose management and insulin delivery using an insulin pump. These artificial pancreas devices, the result of incremental discoveries made from years of research supported by NIDDK, could revolutionize both treatment options and health outcomes for people with type 1 diabetes. Hybrid closed loop systems are now commercially available for individuals with diabetes.

NIDDK's multi-site study, the Diabetes Prevention Program (DPP), has also directly led to type 2 diabetes prevention on a nationwide scale. The study's results in 2002 showed that moderate weight loss through dietary changes and physical activity, or the drug metformin, can prevent or delay type 2 diabetes in those at high risk for the disease.

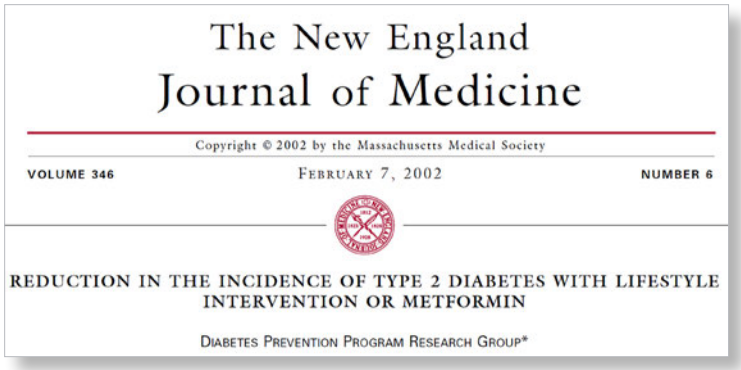
Along with grantees, major DPP contributions came from scientists at NIDDK's Phoenix Epidemiology and Clinical Research Branch in Arizona, who worked with American Indians to ensure they were among the study's diverse participant pool.

APOLLO study Community Advisory Council

PHOTO: LAURIE RUSSELL, WAKE FOREST UNIVERSITY

In fact, nearly half of the study participants were from racial and ethnic minority groups, because these groups are at higher risk for type 2 diabetes than the non-Hispanic white population.

"The DPP and its ongoing follow-up in the DPP Outcomes Study have given us an incredible wealth of information by following a diverse group of people early in the course of development of type 2 diabetes," said Dr. Judith Fradkin, former director of NIDDK's Division of Diabetes, Endocrinology and Metabolic Diseases, who retired in 2018 after nearly 40 years at NIDDK.



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REDUCTION IN THE INCIDENCE OF TYPE 2 DIABETES WITH LIFESTYLE INTERVENTION OR METFORMIN

DIABETES PREVENTION PROGRAM RESEARCH GROUP*

Rodgers concurred. "Many minority and underrepresented groups are disproportionately affected by diabetes and other conditions in NIDDK's mission," he said. "As the DPP showed, studies must reflect that diversity for results to be truly applicable and we remain committed to being inclusive in our research efforts."

Above, current and past NIDDK directors (from l) Drs. Griffin Rodgers, Phillip Gorden and Allen Spiegel; below, Diabetes Prevention Program results published in *NEJM* in 2002

PHOTO: NIDDK

Reflecting this commitment, NIDDK's work in kidney disease has long aimed to better understand the disproportionate burden of kidney disease among black Americans and how to improve health outcomes.

In 2008, research from NIDDK scientists and grantees led to the groundbreaking discovery that variants in a gene called APOL1 are associated with a higher risk of kidney disease and that these variants are found almost exclusively in people of African descent.

Today, the NIDDK-supported APOLLO study, or APOL1 Long-term Kidney Transplantation Outcomes Network, is exploring how these gene variants affect kidney transplantation, with the goal of improving transplant outcomes in both kidney donors and recipients. The study enlisted an advisory committee of black Americans with kidney disease to ensure that the people most affected by the findings have a key role in the research process.

The APOLLO study exemplifies a core tenet of NIDDK's philosophy: putting the people it serves at the center of its research.

"The key is to realize that it's not about you, it's about everybody else that you're serving," said Dr. Allen Spiegel, NIDDK director (1999-2006), in a 2019 oral history. "If you keep that in mind, you can be successful."

Some of NIDDK's most notable successes have been in liver research, including the

The Control-IQ artificial pancreas system was derived from research done at the Center for Diabetes Technology at the University of Virginia.

IMAGE: TANDEM DIABETES CARE

Nobel Prize-winning discovery of the hepatitis B virus by an NIDDK scientist, and the first successful human liver transplantation, performed by an NIDDK grantee.

Research advances led to a vaccine for hepatitis B, available since 1982, which has greatly reduced the disease's prevalence.

Scientists at NIDDK also tested the first effective therapy for chronic hepatitis C in the 1980s, and more recently, NIDDK-funded research has helped identify several direct-acting viral drugs being used to treat—and cure—hepatitis C. NIDDK scientists are now working to develop a hepatitis C vaccine, which, if successful, could help dramatically reduce the virus' spread.

These and countless other achievements across the institute reflect the dedication of scientists—both intramural and extramural—and of NIDDK staff, who all share the vision of improving public health.

"At NIDDK, one of the enormous resources is the quality of people, not only the scientists, but all the people who work on grants, who help maintain this whole community that we've developed through thick and thin," said Dr. Phillip Gorden, NIDDK director (1986-1999) and current senior investigator, in his oral history.

This spirit of collaboration and service across NIDDK has helped shape the institute over the past 70 years and will continue to fuel its progress in the years to come. R

DUE IN 2021

NIAMS Prepares to Welcome New Director Criswell

BY ALISA ZAPP MACHALEK

After more than a year and a half without an appointed director, NIAMS staff learned recently that Dr. Lindsey Criswell had been tapped to fill the position. She is currently at the University of California, San Francisco (UCSF). She serves as the university's vice chancellor of research as well as professor of rheumatology and a professor of orofacial sciences. She plans to start her NIAMS duties in early 2021.

In announcing his decision, NIH director Dr. Francis Collins said: "Dr. Criswell has rich experience as a clinician, researcher and administrator. Her ability to oversee the research program of one of the country's top research-intensive medical schools and her expertise in autoimmune diseases, including rheumatoid arthritis and lupus, make her well-positioned to direct NIAMS. I look forward to having her join the NIH leadership team early next year.

Dr. Lindsey Criswell

"I also want to thank Dr. Robert H. Carter for his exemplary work as the acting director of NIAMS since December 2018," Collins continued.

Shortly after the announcement, Carter gathered NIAMS staff for a virtual Town Hall. "The goal of this meeting," he said, "is to inform you all about working through the transition, the start of a new era for us."

Few, if any, at the institute have ever experienced a directorship change at NIAMS. The institute was established in 1986, and has only had two directors. The last director—the beloved Dr. Stephen Katz, who passed away suddenly in December 2018—served for 23 years.

"Lindsey passes the 'Katz' test," Carter said, channeling the former director's description of an ideal scientific leader. "She's a good scientist, a good administrator and someone you'd like to have over for dinner. I'm terrifically excited to have her named as director and I'm completely committed to supporting her and making the transition as smooth as possible.

"I believe Lindsey will bring new energy, new vision, a new sense of purpose to NIAMS," added Carter. "Having her at the helm will be a real blessing."

Once Criswell is on board, Carter will return to his role as deputy director. "The staff who work here are what make this a pleasure," he said. "I'm sure Lindsey will enjoy working with you all. Keep up the great work."

Criswell has been a principal investigator on multiple NIH grants since 1994 and has published more than 200 peer-reviewed journal papers. Her research focuses on the genetics and epidemiology of human autoimmune disease, particularly rheumatoid arthritis and systemic lupus erythematosus. Using genome-wide association and other genetic studies, her research team contributed to the identification of more than 30 genes linked to these disorders.

Criswell's many honors include the Kenneth H. Fye, M.D., endowed chair in rheumatology and the Jean S. Engleman distinguished professorship in rheumatology at UCSF, and the Henry Kunkel Young Investigator Award from the American College of Rheumatology. She also was named UCSF's 2014 Resident Clinical and Translational Research Mentor of the Year. During her career, she has mentored some four dozen students (high school through medical/graduate school), medical residents, postdoctoral fellows and junior faculty.

She earned a bachelor's degree in genetics and a master's degree in public health from the University of California, Berkeley. She went overseas for a D.Sc. in genetic epidemiology from the Netherlands Institute for Health Sciences, Rotterdam, then returned to the U.S. to earn an M.D. from UCSF. In addition to completing a residency in internal medicine and a fellowship in rheumatology, she is certified as a first responder in wilderness medicine.

Kim

CONTINUED FROM PAGE 1

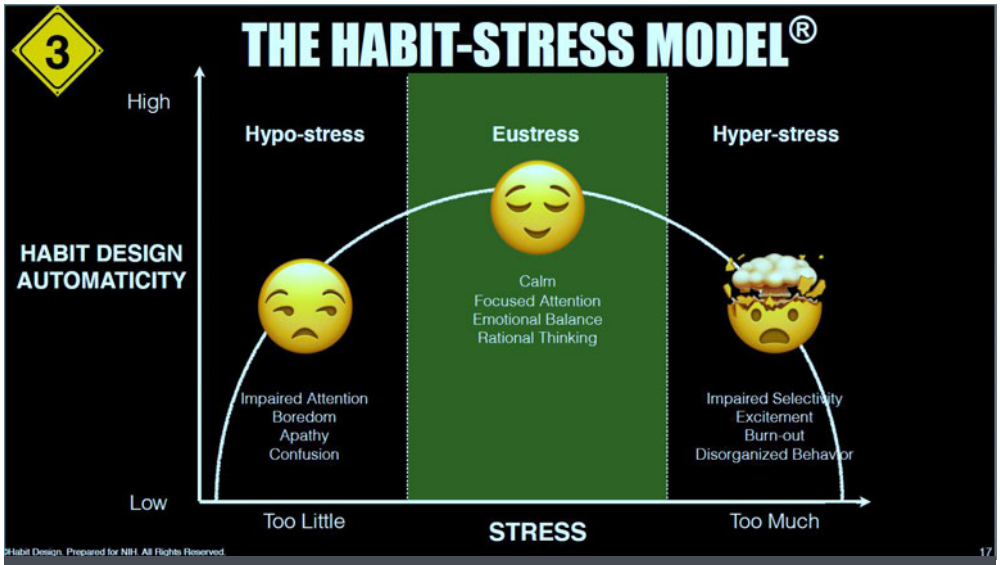
scientific research, we now know it actually takes much, much longer than that to form healthy habits that matter—it's more like 66 days or longer," said Kim during a Sept. 15 webinar presented by the NIH Strategic Change Community of Practice.

Grit and determination alone will not help people reach this threshold, he explained. Inevitably, they become stressed, burn out and, eventually, stop trying. He noted that people must realize "the only way to act upon our intentions without expending precious willpower is through habits."

Every behavior lives within a sequence of preceding and subsequent behaviors, he explained. If, for instance, a person wants to learn how to high jump, he or she would work with a coach to learn the actions that come before and after the take-off.

"You're learning how to apply various key steps into your daily routine to execute towards the new habit," Kim said. "This is what's called shaping, a conditioning method that applies positive reinforcement to progressive steps towards a goal."

To accelerate habit formation, he advised identifying three behaviors that must follow one another. This chain of behaviors is what Kim calls a habit design. Each part of the sequence must happen immediately after the other.



One of Kim's slides illustrates what he calls the "Habit-Stress Model."

IMAGE: HABIT DESIGN

First, people should think about what he calls the "minimum viable incremental dosage" of a habit. For example, if a person wants to start a new walking routine, he or she should begin by walking one block. Then, slowly increase the distance by another block. Even though it sounds simple, it's not easy.

"Many people start by doing way too much, which might feel good when they are rested, ready and motivated," he said. "We tell people, 'Little by little, a little becomes a lot.'"

Next, a person must identify an existing habit that he or she already performs without much conscious effort in the same physical location every day. This is called an anchor step. A person might, for example, put shoes on every day to go outside to retrieve the mail. From there, it's easier to walk one block because that person is already out of the house.

The final part of the sequence is to insert a step between the first and last one that makes it easier to do the habit. This is called a trigger step. It locks a person into following through. For instance, after a person retrieves the mail from the mailbox, he or she might leash the dog.

"My dog makes it virtually impossible for me not to walk with him once I put on the leash," Kim said.

Our brains are wired to respond negatively to new challenges, even if those challenges are beneficial, he explained. When a person is pushed beyond what he or she can handle, habit formation will "suffer from the impact of what clinicians call 'hyper-stress.'" In this state, little things can trigger a strong emotional response. On the other hand, it's also possible to have too little stress to be effective in forming a habit successfully.

There is a happy medium called "eustress," which is "positive stress that arises from increased physical activity, enthusiasm and creativity." Eustress arises when motivation and inspiration are needed. A concert musician might, for example, experience butterflies before a show. This is where habits thrive. As habits become more automatic, the greater the likelihood of creating eustress.

"What the latest clinical research tells us is that it's not reducing hyper-stress that makes performing habits possible," Kim said. Rather, it's the reverse: making habits more automatic reduces hyper-stress.

Changing behavior and creating lasting habits often fail in large organizations because employees are frequently resistant to being changed by an organization, even if they themselves agree with the proposed changes. Kim said employees engage better if they first learn together how to change behaviors of their own choosing for their own benefit before addressing

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-MICHAEL KIM

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any evangelized behaviors from their organization.

From analyzing the long-term effects of training more than 100,000 employees, Kim and his clinical team observed that, after a year, trainees found an additional 5 minutes of productivity per hour, per day on average. Those extra minutes of productivity can add up to an extra day of productivity per week or, from another point of view, 8 weeks of vacation per year, saving one prominent Silicon Valley law firm almost $3 million each year. McKinsey & Co., a partner, published independently conducted research showing a 180 percent return on investment from applying habit training to address obesity in the U.K.

"Five minutes an hour might not sound like a lot, but within the context of a year and for an organization where time is literally money, 5 minutes is tremendous," Kim concluded. "But little by little, a little becomes a lot."

This year's Combined Federal Campaign kickoff was held virtually, due to the Covid-19 pandemic.

Virtually Engineered 2020 Combined Federal Campaign Kicks Off

The CFC will have a new but not unexpected wrinkle this year—it is all virtual. As NIH director Dr. Francis Collins alludes to in his 2020 CFC message, we won't be embarrassing him and the IC directors with shooting hoops or attempting 40 push-ups this year. However, undaunted, the NIH CFC coordinators, along with this year's lead IC, the National Institute of Biomedical Imaging and Bioengineering, are vigorously "engineering" a CFC campaign that will come to you through your computer screen.

You can watch the inspirational kickoff message from the NIH director at https://cfc.nih.gov/, where Collins stresses that the hardships Covid-19 has placed on individuals and families make our support of charities more important than ever. CFC co-chair NIBIB director Dr. Bruce Tromberg adds that this year's campaign theme "Show Some Love—Be the Face of Change" "reflects a climate of change and the many facets of adapting to a virtual world."

Another change for this year's CFC is that, acknowledging the effects of Covid-19 on NIH'ers and their families, the NIH CFC goal has been set at $1 million, reduced from the $2 million goal of previous years.

The video of the Oct. 8 CFC kickoff featuring Collins, Tromberg and NIBIB Executive Officer Jason Ford can be viewed at https://videocast.nih.gov/watch=38793.

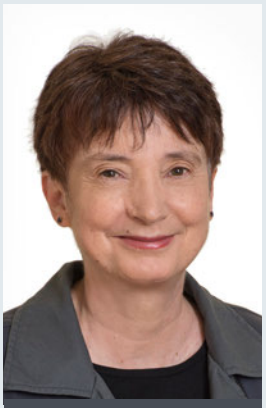
The first event of the 2020 season is a Halloween Charity Fair and Mask Contest, which will be held Oct. 29, from 11 a.m. to 12:30 p.m. It is your opportunity to have fun designing an original mask that is creative, inspirational, funny or scary—with extra points for including a CFC message. Additional information about the virtual event and how to enter will be arriving in your inbox soon.

Stay tuned for more CFC announcements and check your NIH email for Tromberg's Sept. 24 kickoff message, which concludes, "Although many of us are apart, we can come together virtually and learn about joining the CFC community and get inspired to 'Be the Face of Change.'"

'MIND THE GAP'

Palmer Tapped for Next ODS Seminar on Risk Prediction Models

The Office of Disease Prevention will hold a Methods: Mind the Gap webinar with Dr. Julie R. Palmer on risk prediction models for breast cancer in black women. It will take place on Tuesday, Oct. 20 at 11 a.m.



Dr. Julie R. Palmer

The webinar will address the relatively low performance of risk prediction models for breast cancer in black women versus performance in other populations, and possible reasons for the observed disparity. Methodological approaches, including the consideration of differential risk factors for specific molecular subtypes of breast cancer, will be discussed.

Palmer is the Karin Grunebaum professor in cancer research at Boston University School of Medicine, director of the Slone Epidemiology Center and a Komen scholar. Her research program focuses on the etiology of breast cancer, with an emphasis on African-American women. She has been a leader of the Black Women's Health Study since its inception in 1995.

Registration is required at https://prevention.nih.gov/education-training/methods-mind-gap/risk-prediction-models-breast-cancer-black-women-importance-considering-molecular-subtypes. The webinar will be recorded and available on the ODP website within about a week.

About 14 percent of all cases of cerebral palsy may be linked to genes that control how brain circuits become wired during early development.

Some Cerebral Palsy Cases May Be Tied to Brain-Wiring Genes

In an article published in *Nature Genetics*, researchers confirm that about 14 percent of all cases of cerebral palsy, a disabling brain disorder for which there are no cures, may be linked to a patient's genes and suggest that many of those genes control how brain circuits become wired during early development. This conclusion is based on the largest genetic study of cerebral palsy ever conducted. The results led to recommended changes in the treatment of at least three patients, highlighting the importance of understanding the role genes play in the disorder. The work was largely funded by NINDS.

"Our results provide the strongest evidence to date that a significant portion of cerebral palsy cases can be linked to rare genetic mutations, and in doing so identified several key genetic pathways involved," said Dr. Michael Kruer, a neurogeneticist at Phoenix Children's Hospital and the University of Arizona College of Medicine, Phoenix, and a senior author of the article. "We hope this will give patients living with cerebral palsy and their loved ones a better understanding of the disorder and doctors a clearer roadmap for diagnosing and treating them."

Cerebral palsy affects about one in 323 children in the United States. Signs of the disorder appear early in childhood, resulting in a wide range of permanently disabling problems with movement and posture including spasticity, muscle weakness and abnormal gait. Nearly 40 percent of patients need some assistance with walking. In addition, many patients may also suffer epileptic seizures, blindness, hearing and speech problems, scoliosis and intellectual disabilities.

Since cerebral palsy's first official description in 1862, scientists have hotly debated whether it is caused by problems at birth. For instance, it is known that babies born prematurely or who experience a lack of blood flow or oxygen during birth have a greater chance of suffering from the disorder. Later though, researchers concluded that a majority (85-90 percent) of all cases are congenital, or born with the disease, and some studies had suggested that cerebral palsy could be inherited. Despite this, the causes of many children's cases had remained elusive.

Then in 2004, scientists discovered the first genetic mutation known to cause cerebral palsy. Since then several more mutations have been identified and, depending on how an experiment was performed, scientists have estimated that anywhere from 2 to 30 percent of all cases may be linked to a misspelling in a patient's DNA.

In this study, the researchers provided support for a previous estimate and highlighted which genes may play a critical role in the disorder.

"Treatments for cerebral palsy patients have not changed for decades," said Kruer. "In the future, we plan to explore how these results can be used to change that."

A phase 1 trial of a vaccine to prevent SARS-CoV-2 has shown that the vaccine is well-tolerated and generates a strong immune response in older adults.

Investigational Covid-19 vaccine Well-Tolerated and Generates Immune Response in Older Adults

A phase 1 trial of an investigational mRNA vaccine to prevent SARS-CoV-2 infection has shown that the vaccine is well-tolerated and generates a strong immune response in older adults. A report published Sept. 29 in the *New England Journal of Medicine* describes the findings from the study, which was supported by NIAID.

The experimental vaccine, mRNA-1273, was co-developed by researchers at NIAID and Moderna, Inc. The phase 1 trial began on Mar. 16 and was expanded to enroll older adults about 1 month later. Older adults are more vulnerable to complications of Covid-19 and are an important population for vaccination. Understanding how the vaccine affects older adults is a critical part of measuring its safety and efficacy.

Overall, the researchers found that the investigational vaccine was well-tolerated in the older age group. Although some volunteers experienced some transient adverse effects, including fever and fatigue after vaccination, the researchers found that they also exhibited a good immune response to the vaccine: the blood of vaccinated volunteers contained robust binding and neutralizing antibodies against SARS-CoV-2. Importantly, the immune response to the vaccine seen in older volunteers was comparable to that seen in younger age groups.

The study will continue to follow the older volunteers for about a year after second vaccination to monitor the long-term effects of the vaccine. According to the researchers, these phase 1 trial results further support testing of the investigational vaccine in older adults in an ongoing large phase 3 trial.

NPWT does not lower risk of infection for obese women after cesarean delivery.

Negative Pressure Wound Therapy Doesn't Cut Infection Risk in Obese Women after Cesarean

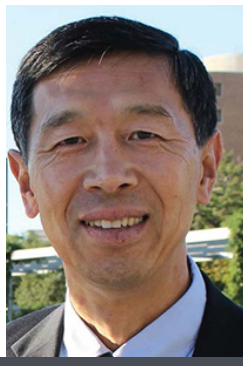
Negative pressure wound therapy (NPWT) does not appear to lower the risk of infection for obese women after cesarean delivery, suggests a study funded by NIH. The treatment involves placing a low-pressure pump over a closed surgical wound to create negative air pressure. Earlier studies had suggested that NPWT might reduce infection risk and promote healing after surgery. The study of more than 1,600 obese women found no significant difference in infection between women treated with NPWT and those receiving standard wound dressing.

The study, funded by NICHD, was published in the *Journal of the American Medical Association.*

Obese women are more likely to have cesarean delivery and more likely to develop an infection at the surgical site. In the current study, half of the women were assigned at random to receive NPWT; the other half received standard wound dressing. In the negative pressure group, 29 women developed infection at the surgical site, compared to 27 in the standard dressing group, a difference that was not statistically significant. Rates of major adverse events, such as death, blood infection (sepsis) and need for hysterectomy after surgery, also did not differ significantly. However, women in the negative pressure group were more likely to have skin irritations, such as blistering, bleeding and redness.

The study authors concluded that their findings do not support the routine use of NPWT for obese women who deliver by cesarean.

HHS Honors Two from NIH



HHS honorees Dr. Sheue-yann Cheng of the National Cancer Institute and Dr. Paul Liu of the National Human Genome Research Institute

The Federal Asian Pacific American Council recently announced the recipients of the 2020 Dr. Howard K. Koh Award for Excellence in Leadership at HHS and the 2020 Dr. Francisco S. Sy Award for Excellence in Mentorship at HHS.

The Koh award recognizes an employee from the Asian American/Native Hawaiian/Pacific Islander (AANHPI) community who exemplifies outstanding leadership, service integrity and excellence, and has significantly contributed to the HHS mission.

The Sy award recognizes an employee from the AANHPI community who has provided exceptional mentorship to others and fostered their professional growth and career development.

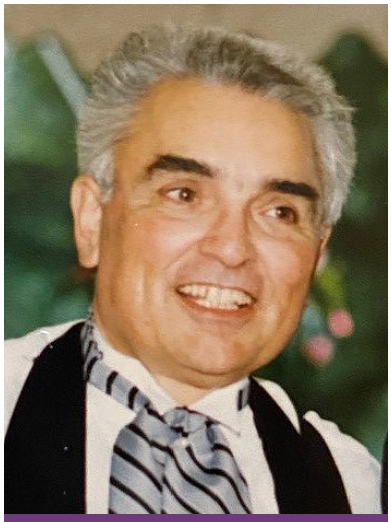
Dr. Paul Liu, deputy scientific director and a senior investigator at the National Human Genome Research Institute, shared the Koh award with Dr. Robin M. Ikeda, associate director for policy and strategy at the Centers for Disease Control and Prevention. Dr. Sheue-yann Cheng, a senior investigator and chief of the gene regulation section at the National Cancer Institute, received the Sy Award.

Scotto, Former DCEG Biostatistician, Mourned

Joseph Scotto, retired biostatistician and epidemiologist at the National Cancer Institute, passed away on Aug. 5 at the age of 81. In 1962, following graduation from Columbia University School of Public Health, he joined NCI's Biostatistics Branch as a commissioned officer in the Public Health Service. He retired in 1992 after 30 years of service.

During his NCI career, Scotto applied his expertise in statistics toward the development of population-based studies of skin cancer.

Prior to the 1970s, the descriptive statistics on non-melanoma skin cancer incidence were grossly underestimated due to the reliance on hospital diagnoses, which did not capture most of these cases.



Joseph Scotto, retired biostatistician and epidemiologist at NCI

Scotto took the lead in designing and conducting periodic surveys of skin cancer in parts of the country involved in studies of cancer incidence and mortality. He joined forces with other agencies to measure ground-level ultraviolet radiation (UV)-B exposure in those areas, clarifying the relationship between exposure to UV and risk of skin cancer. These data provided evidence needed to address mounting public health concerns about the thinning of the ozone layer in the atmosphere, a result of certain human-made environmental pollutants.

Together with Dr. Thomas Fears of the Biostatistics Branch, Scotto utilized the trends in skin cancer and UV-B exposure along with satellite data to develop innovative mathematical models to project trends of skin cancer expected from further reduction in the protective ozone layer. The results of these studies are summarized in separate chapters on UV radiation and non-melanoma skin cancer published in the first three editions of the textbook *Cancer Epidemiology and Prevention*, edited by David Schottenfeld and Joseph F. Fraumeni, Jr.

"Joe's portfolio of research in non-melanoma skin cancer filled major gaps in our understanding of these extremely common tumors," said Fraumeni. "His leadership in skin cancer epidemiology, his outgoing personality and his collaborative approach to working with scientists at other agencies, including EPA, NOAA and NASA, have provided a model for evaluating and mitigating threats to public health that may be posed by climate change."

Study Needs Healthy Children

NIAID researchers seek healthy children, 2 and older with no history of food allergy, asthma or eczema to participate in a study. Researchers are comparing information from children with and without food allergies to better understand how food allergies affect development and health. Compensation is provided. For more information, contact the Clinical Center Office of Patient Recruitment, 1-866-444-2214 or prpl@cc.nih.gov. Read more online at https://go.usa.gov/xGyJx. Refer to study 15-I-0162.

People with Psoriasis Needed for Study

Do you or someone you know have mild to moderate psoriasis? Researchers at the Clinical Center are testing a form of vitamin B3 dietary supplement to help improve the immune system function in the blood and skin of people with mild to moderate psoriasis. Treatments and research procedures are provided at no cost. Refer to study 20-H-0044. Read more at https://go.usa.gov/xdH2Y. For more information, call the Clinical Center Office of Patient Recruitment at 866-444-2214, or email PRPL@cc.nih.gov. For callers who are deaf, hard-of-hearing, deafblind or speech impaired, the Federal Relay Service (www.federalrelay.us/) provides free telecommunications relay services.

People with RUNX1 Mutations Sought

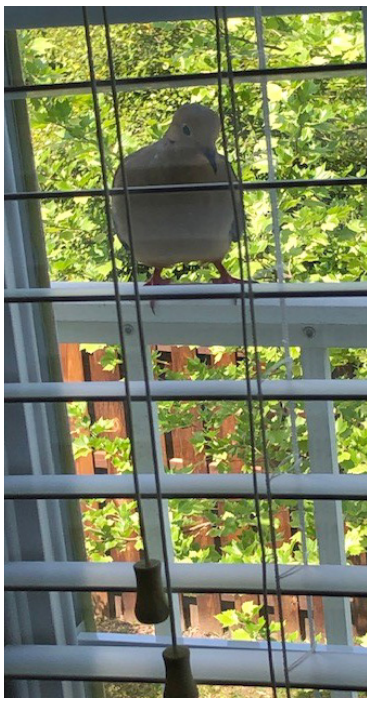
Do you or someone you know have germline RUNX1 mutations? Researchers at the National Human Genome Research Institute are conducting a study to better understand the disease progression and underlying mechanisms, which will lead to better clinical management and development of new therapies. Participation in the study will be at no cost to you. Travel may be provided. Contact us at 866-444-2214, PRPL@cc.nih.gov. Refer to study 19-H-0059. Read more online at https://go.usa.gov/xvqEr. For those callers who are deaf, hard-of-hearing, deafblind or speech-impaired, the Federal Relay Service (www.federalrelay.us/) provides free telecommunications relay services. View your preferred relay service at www.federalrelay.us/federal-relay-services.

The foggy picture is from Baker Park in Frederick, Md., and the picture with the flowers is from the C&O Canal, downstream from Point of Rocks, said Dr. David Cassatt, a program officer with NIAID.

Dr. Daphne W. Bell, a senior investigator in the reproductive cancer genetics section of NCI's Cancer Genetics and Comparative Genomics Branch, sent a "photograph that I took of a baby fawn, hidden by its mother behind an iris patch in my garden this past spring. It stayed there for 10 days; by day 8 it was exploring the garden, with 'Mum' watching from a distance. Apparently deer 'hide' their young and graze at a safe distance so that predators do not find the fawn; they feed the fawn at dawn and dusk."

Answering the Call of Nature

Following an unusual season in which the majority of us spent lots of time observing various phases of lockdown, quarantine and/or isolation, the *Record* asked its readers: What have you seen outside that might have escaped your notice before? As usual, NIH'ers came through with outstanding answers. Here are some of the images we've received so far. There's still time, if you want to share. Send (high-resolution color digital) image(s) with a brief caption to rm26q@nih.gov or cg9s@nih.gov.



Helen Hunter Cox, a senior grants management specialist at NIDDK, shares two images: **Morning Visitor** (l). "A curious visitor outside my kitchen seemed to be wondering why the humans are still at home each day!" **August 2020 Rainbow** (above) "Somewhere over I-95...a beautiful, vivid rainbow after an August storm."