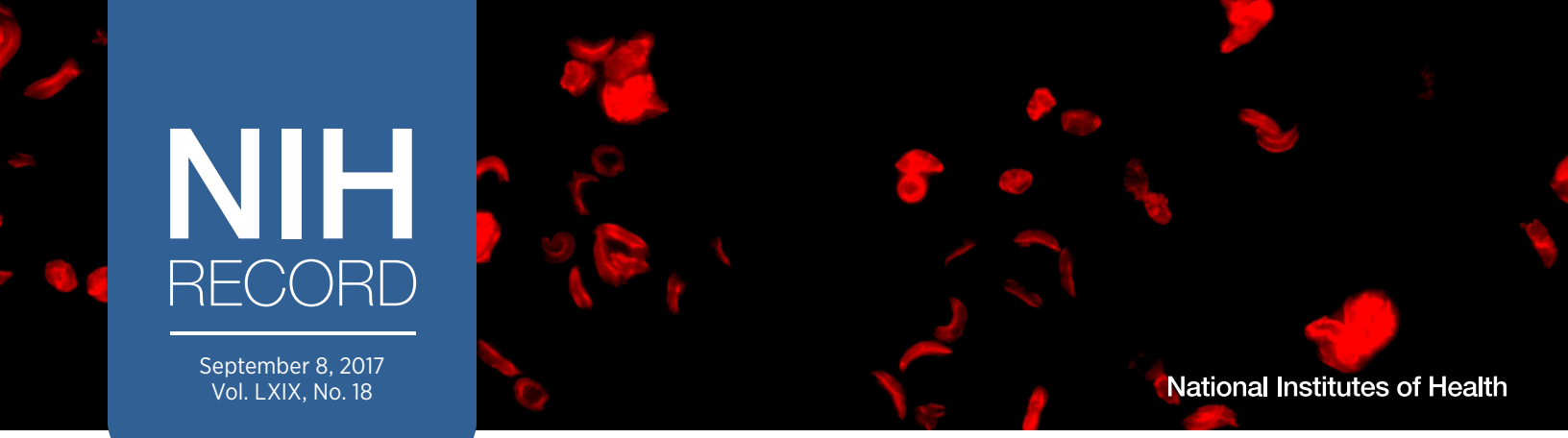
NIH RECORD

September 8, 2017
Vol. LXIX, No. 18



'IT'S A PARTY OUT HERE'

Solar Eclipse Prompts Outdoor Gatherings

Even though NIH got only a tad more than 80 percent "obscuration" from the nationwide solar eclipse on Aug. 21, it still became an occasion for outdoor conviviality in all quadrants of campus.

As the moon's shadow invaded the face of the sun at 1:17 p.m.—it cut diagonally across the star's disk from roughly the 2 o'clock to the 8 o'clock position—one could stroll up Center Dr. past Bldgs. 1, 50 and Natcher and see almost no one gazing upward.

At a little past 1:30, a man with a homemade cardboard viewing apparatus appeared in front of Bldg. 38A.

"I didn't know my modeling career wasn't over yet," joked Mike Krzywanos of the National Library of Medicine's Office of Computer and Communications Systems. He had made the box earlier that day, and was testing it out with colleague Nick Napoli.

Like many NIH'ers, Napoli tried to capture the eclipse on his cell phone, with mixed results.

The real action at NLM was on top of the parking deck on the west side of 38A. There, Dr. Laks Iyer, a staff scientist in the National Center for Biotechnology Information, had set up his 6-inch Dobsonian mount reflector telescope. More than two dozen people, mostly from NCBI, gathered for a peek. A Mylar filter made it easier to see images captured at 48X magnification.

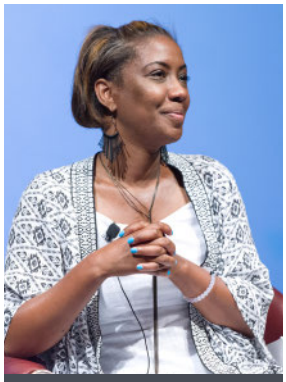
Clearly visible through the telescope were sunspots. "They look like the floaters I see [in my own eyes]," said one woman. Others thought the spots were just dust on the lens.

SEE **ECLIPSE**, PAGE 6

NCBI's Dr. Laks Iyer (l) helps a woman use the telescope he brought to view the eclipse.

NIH, Family of Henrietta Lacks Work to Advance Science, Protect Privacy

BY ERIC BOCK



Jeri Lacks-Whye

Henrietta Lacks is survived not only by descendants, but also by another legacy: millions of lives saved by research using cancer cells taken from her body without her knowledge.

Two of Lacks' grandchildren, Jeri Lacks-Whye and David Lacks Jr., joined NIH director Dr. Francis Collins on the Masur Auditorium stage for a conversation recently about the unique collaboration

SEE **LACKS**, PAGE 4

A school representative explains the different programs of study available to potential advanced degree candidates.

Grad School Fair Encourages Students to Embrace Community, Diversity

BY KATHERINE LEE

Recently, more than 800 students at NIH sought mentorship and advice from school officials representing 136 advanced degree programs across the United States. The 10th annual NIH Graduate and Professional School Fair, hosted by the Office of

SEE **GRAD FAIR**, PAGE 8

HHS Secretary returns for VRC tour. See p. 2.

ALSO THIS ISSUE

Briefs 2
Clinical Center Seeks Continuous Improvement, Plans Renovations 3
Harlem Youngster Gets VIP Tour 5
Digest 9
Milestones 10
Volunteers 11
Seen 12

Happ To Give NINR Director's Lecture

Dr. Mary Beth Happ will give the third 2017 NINR Director's Lecture on Wednesday, Sept. 20 from 1 to 2 p.m. in Lipsett Amphitheater, Bldg. 10. In her presentation, "Giving Voice to the Voiceless: Improving Communication with Critically Ill Patients," Happ will describe her program of research that addresses family bedside presence during critical illness, end-of-life care and treatment decision-making in the ICU and patient and family outcomes in acute-critical illness.

Dr. Mary Beth Happ

Happ is a nursing distinguished professor of critical care research and associate dean of research and innovation at Ohio State University College of Nursing. She is an NIH-funded researcher in the areas of critical care and aging. For more than 20 years, Happ's research has focused on improving care and communication with impaired patients and their families and clinicians during hospitalization and at the end of life. She developed the SPEACS-2 online training program and toolkit for use with ICU patients. She is a fellow in the Gerontological Society of America and the American Academy of Nursing. Happ has authored more than 120 journal articles, editorials and book chapters.

The NINR Director's Lecture series is designed to bring the nation's top nurse scientists to campus to share their work and interests with a transdisciplinary audience. The event is free and open to the public. For more information and to register, visit www.ninr.nih.gov/directorslecture.

Institute Challenge Relay, Sept. 28

The 34th NIH Institute Challenge Relay will be held Thursday, Sept. 28, starting at 11:30 a.m.

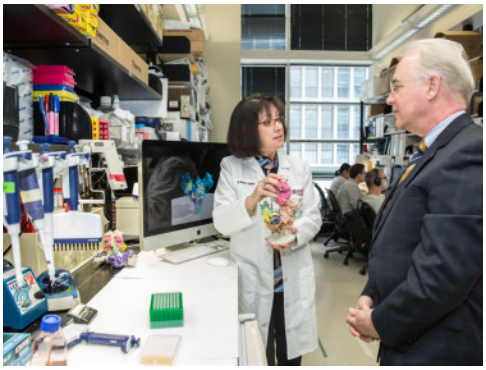
The relay consists of teams of 5 runners, each of whom runs a half-mile course. All institutes, centers, divisions and contractors are invited to enter as many teams as they wish. Each team must have men and women runners, with at least two runners of the same sex.

The registration fee is $15 per team. To sign up for the race and to find out where it is being held—the traditional site in front of Bldg. 1 may not be available due to construction in that vicinity—visit http://govemployee.com/nih/2017/06/28/time-to-start-training-the-institute-relay-is-september-28th/. To be a race volunteer or for more information, contact the R&W office at (301) 496-6061.

HHS Secretary Price Tours Vaccine Research Center

HHS Secretary Tom Price spent a couple of hours at NIH on Aug. 10 touring NIAID's Vaccine Research Center. After a meeting (above) with top NIH leaders including NIH director Dr. Francis Collins, NIH principal deputy director Dr. Lawrence Tabak and acting chief of staff Dr. Carrie Wolinetz, the secretary and several of his top staffers heard science briefings on NIH's Approach to Emerging Infections by NIAID director Dr. Anthony Fauci (below, l) and a VRC overview with updates about the Zika vaccine program by VRC director Dr. John Mascola. Next on the agenda were three laboratory demonstrations: on the flu vaccine program and other respiratory viruses by VRC deputy director Dr. Barney Graham along with Dr. Michelle Crank, head of the translational sciences core in the Viral Pathogenesis Laboratory and head of the flu program under Graham, and Dr. Jeffrey Boyington, a structural biologist in Mascola's Laboratory of Virology; on cytofluorometric analysis by Dr. Mario Roederer, acting director of the VRC Translational Research Program and chief of the immunotechnology section; and on the Ebola program by Dr. Nancy Sullivan (below, r), chief of the VRC biodefense research section. This was Secretary Price's second visit to campus; a February visit focused on the Clinical Center.

PHOTOS: CHIA-CHI CHARLIE CHANG



2017 NIH Research Festival Set for Sept. 13-15

The 2017 NIH Research Festival: A Celebration of Intramural Science will be held Sept. 13-15. This is the annual showcase of intramural research, highlighting the diversity of scientific disciplines at NIH. There will be three plenary sessions, one each morning, on: The BRAIN Initiative; Inflammatory Diseases; and The Cancer Moonshot. The concurrent symposia sessions, which will take place in the afternoons, will focus on cell-based therapies; developmental biology; genotyping and phenotyping; neuroscience and compulsive behaviors; single-cell genomics; microbiome; and RNA biology and therapeutics.

This year's festival will be held in Bldg. 10 and will include—in addition to the plenary sessions and concurrent symposia sessions—poster sessions with more than 350 posters. On Wednesday afternoon, Sept. 13, there will be a special session featuring posters by institute directors and scientific directors; a cooking contest; and posters from the Future Research Leaders Conference attendees, sponsored by the chief officer for scientific workforce diversity.

Other highlights include the NIH Green Labs Fair and exhibits; the FARE awards ceremony; R&W Taste of Bethesda lunch; animal tribute ceremony; the Technical Sales Association Vendor Tent Show; and virtual reality demonstrations at the NIH Library.

Visit http://researchfestival.nih.gov for the full schedule, including downloading options.

Clinical Center Seeks Continuous Improvement

BY DONOVAN KUEHN

For more than 60 years, the Clinical Center has been a world leader in clinical research. This status comes with a great responsibility for patient safety and clinical quality. Over the past year and a half, the CC has bolstered its efforts to achieve the highest standards in patient care and safety while carrying out cutting-edge research protocols.

In a recent statement, NIH director Dr. Francis Collins noted, "Clinical and research staff have embraced the pursuit of high reliability and are focused on early recognition of potential problems and providing solutions for continuous improvement."

Initiatives at the hospital have focused on changes in five areas:

• Improving patient safety and quality of care to achieve world-class standards

• Engaging CC staff to instill a culture of high reliability

• Ensuring reporting and compliance meets the highest standards

• Improving infrastructure and facilities to support pioneering research, and

• Restructuring hospital leadership to ensure clear lines of responsibility and accountability.

These changes represent the hospital's commitment to improve and have been implemented in specific ways.

Since late 2016, hospital leaders have come together for a daily patient safety huddle to look back at the previous day and plan for the current one. The huddles were established to share any potential or existing safety, quality or service issues across all departments. As information is shared, any concerns that require immediate follow-up or longer discussion are addressed immediately.

Staff from CC departments and NIH institutes convene daily at 8:40 a.m. in the medical board room to report on concerns from the previous 24 hours and to look ahead to any potential safety or quality issues expected over the next day.

The Clinical Center also implemented the Safety Tracking and Reporting System, also called STARS.

• • •

"The stakes are too high to do anything but the best for our patients."

–DR. JAMES GILMAN

• • •

It focuses on tracking service quality concerns such as delays, errors and unsafe environmental conditions, as well as instances of exceptional customer service. The data entered into STARS forms the backbone for how the hospital tracks issues and plans permanent solutions. All NIH investigators and research staff have been trained to ensure full awareness and compliance with event reporting requirements.

Since CC patients and their families are partners in research, the hospital plans to expand STARS access to include their input. In the meantime, they can share safety and quality concerns by contacting the CC patient representative at (301) 496-2626 or through the anonymous patient safety hotline, which was created last year, by calling 1-866-444-8811.

Benchmarking progress toward continuous improvement is important and should be transparent to all who use the hospital. Toward that effort, all patient and employee safety and quality metrics are posted at https://clinicalcenter.nih.gov/.

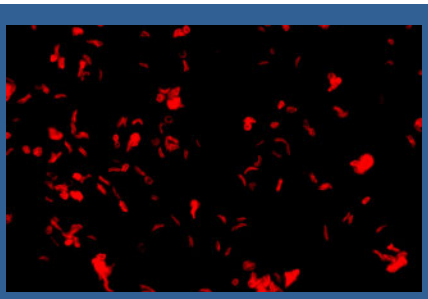
NIH has invested more than $50 million toward improving quality assurance and patient safety, a significant portion of which has supported infrastructure improvements at the CC. More renovations and improvements are planned over the next few years. The hospital's pharmacy department has hired 44 people and instituted a new organizational structure to promote increased oversight and quality assurance.

"Our job is to focus on achieving the highest standards for patient safety and clinical quality, and that can only be achieved through continuous improvement efforts," said Clinical Center CEO Dr. James Gilman. "The stakes are too high to do anything but the best for our patients."

These initiatives are ongoing to ensure that the CC is known not just as a hub of medical discovery and house of hope for patients looking to science for better treatments and cures, but also as a world class provider of clinical care and patient safety.

Highlights of the improvements at the hospital are available at https://www.cc.nih.gov/about/safety/2016_2017.html.

Clinical Center CEO Dr. James Gilman addresses hospital staff at a Clinical Center Town Hall meeting in May. Regular Town Hall meetings are one of the communications strategies adopted by the hospital's leadership to ensure two-way communication with staff.



ON THE COVER: *Mixture of normal and sickle-shaped red blood cells taken from the blood sample of a person with sickle cell anemia, as viewed through a fluorescent microscope. September is Sickle Cell Awareness Month.*

IMAGE: LAUREL MENDELSOHN & EMILIA BARBU, NHLBI

The NIH Record

Since 1949, the *NIH Record* has been published biweekly by the Editorial Operations Branch, Office of Communications and Public Liaison, National Institutes of Health, Department of Health and Human Services. For editorial policies, email editor or phone (301) 496-2125.

Editor: Rich McManus
Rich.McManus@nih.gov

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

Staff Writers:
Eric Bock • *Eric.Bock@nih.gov*
Dana Talesnik • *Dana.Talesnik@nih.gov*

Subscribe via email: **listserv@list.nih.gov**
Follow: **http://nihrecord.nih.gov/**

The NIH Record is recyclable as mixed paper.

NIH National Institutes of Health
Turning Discovery Into Health

Lacks

CONTINUED FROM PAGE 1

between the Lacks family and NIH.

In February 1951, Lacks, an African-American woman, was diagnosed with an aggressive form of cervical cancer at Johns Hopkins Hospital. Doctors took cells from a biopsy of her tumor and—without her knowledge or consent—cultured them. She passed away later that year at age 31.

Hers were the first human cells to live and grow outside the body in culture. That cell line was denoted "HeLa"—"He" for Henrietta and "La" for Lacks. Her cells have contributed to some of the most important medical advances of the past half-century, including development of the polio vaccine.

Most people weren't aware of the origin of HeLa cells until 2010, when author Rebecca Skloot published *The Immortal Life of Henrietta Lacks*, a bestselling book. Family members became identifiable. The story was later adapted into a television film starring Oprah Winfrey.

"HeLa cells were derived decades before there were federal regulations to require consent for participation in research," Collins said.

In 2013, a German research team published the first HeLa whole genomic sequence and uploaded the findings to a public database. When they found out, the Lacks family raised concerns about whether this might reveal aspects of their own potential medical risks and asked the group to take the information down.

Collins and Dr. Kathy Hudson, former NIH deputy director for science, outreach and policy, made three trips to Baltimore to meet with the Lacks family and hear about their experiences, address their concerns and "see if there was a way forward." Skloot and two Johns Hopkins University professors also participated in the meetings.

NIH reached an agreement with the Lacks family about data sharing later that year. Lacks-Whye said it was a "great honor" that Collins visited Baltimore to "listen to our concerns and questions."

Dr. Dina Paltoo, director of the Office of Science Policy's Division of Scientific Data Sharing, said investigators who want to sequence HeLa cells must ask the HeLa genome data access working group for permission. The group includes two members of the Lacks family. It reports its findings to the advisory committee to the NIH director, which makes recommendations to the director.

The group requires investigators to use the genome only for health, medical or biomedical research objectives; to not initiate contact with the family; to reveal their commercial plans; to acknowledge the family's contributions to science; and to deposit their findings in a controlled-access data repository.

"So far, the working group has evaluated 67 requests, 59 of which have been approved by the NIH director," Paltoo said.

For David Lacks Jr., sitting on the working group is a "rewarding and gratifying" experience. At first, he relied on the committee to answer his questions about genomics. He began studying the field and "dove into the books." Soon enough, he picked up the terminology and, now, when he reads proposals, he thinks, "Wow, they want to do this? I can't wait to see the outcome."

Before the agreement, both grandchildren said the family always learned about developments regarding HeLa cells after

★ ★ ★

"I think it's fair to say the Lacks family probably ranks at the top of the list in all of history as medical philanthropists."

–DR. FRANCIS COLLINS

★ ★ ★

NIH director Dr. Francis Collins discusses the legacy of Henrietta Lacks with her grandchildren Lacks-Whye and David Lacks Jr., who is also shown above at left.

PHOTOS: ANDREW PROPP

Lacks-Whye greets audience members following the discussion in Masur.

the fact. Now they have representation on the working group and are the first to know what's happening to the cell line.

"That makes a big difference. It's a matter of improving communications," Lacks Jr. said. "You don't want to deny science, you just want to know what's happening. Some folks may not think it's important. But for us it is. We want to be involved and engaged."

Collins said the family's experience is a reminder that scientists have an obligation to respect people who are involved in research.

When asked what they thought of the film adaptation of Skloot's book that was recently shown on HBO, both grandchildren thought the movie could have been a mini-series instead of a single show. Overall, though, they enjoyed it.

"It got Henrietta Lacks' name out there," Lacks-Whye said.

Getting to know the Lacks family has been a remarkable experience for Collins and his colleagues. He credited the Lacks' experience over the past 4 years as a reason for the elevated consciousness of issues about balancing respect for people in research and the benefits of open data access.

"I think it's fair to say the Lacks family probably ranks at the top of the list in all of history as medical philanthropists," Collins concluded.

A video of the conversation can be found at https://videocast.nih.gov/summary.asp?Live=24809&bhcp=1.

LASTING IMPACT

NIH Employees Mentor Hopeful Scientist

BY REBECCA NEWTON

Summer enrichment creates the potential for students to improve their academic performance. According to the Administration for Children and Families, children lose knowledge over the summer months when they don't apply what they have learned during the school year.

As an elementary school math teacher, Sindia Vasquez of East Harlem knows all too well how the absence of effective summer learning opportunities can lead to gaps in achievement. Her 8-year-old son, Jesse Lucy, is interested in cancer research.

Jesse's charter school, Success Academy, serves children who reside in communities with poverty rates above 70 percent. Last year, the school was in the top 10 percent of schools in the state of New York for academic performance in English, math and science.

Jesse, a straight-A student with plenty of personality, wants to become a scientist and has a theory about curing cancer. "I want to help a lot of people who are suffering," he says.

So Vasquez contacted Lisa Evans, a scientific workforce diversity officer in the Office of Extramural Programs at NIH. With the help of Dr. DeLoris Hunter of the National Institute on Minority Health and Health Disparities, Evans approached Tara Mowery, chief of visitor operations at the National Library of Medicine. Mowery quickly got to work, setting up an unforgettable day for Jesse and his family.

Jesse, his mother and his 13-year-old sister Brianna—who expressed a desire to become an attorney—embarked on a 4-hour tour where they met some employees with close ties to their home in Harlem.

Jesse Lucy (l) is joined by (from l) NCI's Dr. Brid Ryan, his mom Sindia and sister Brianna.

Troy Wise, a desktop security analyst at NLM and a native of Harlem, interacted with Jesse and offered him plenty of encouragement on his journey. When Wise asked Jesse what he loved about science, the reply was, "Everything."

Jesse also met with Dr. Terry Yoo, a computer scientist at NLM, who provided Jesse a hands-on demonstration of 3-D models and explained how NIH is helping people with cancer. Next, Jesse was guided to the virtual/augmented reality desk, where he donned a virtual reality headset and experienced an interactive display of the human heart. Jesse, who likes to be called "Professor Lucy," found this very "cool."

Jesse visited biologist Kevin Bishop, also from Harlem, in the zebrafish core facility of the National Human Genome Research Institute. There he saw firsthand how researchers perform experiments, illuminate disease mechanisms and learn how much humans and fish are alike.

Before leaving, Jesse and his family had lunch with Herman Chenwi, a post-baccalaureate fellow in the Division of Intramural Research of the National Institute of Child Health and Human Development, to discuss—what else?—science. The group then met with Stadtman investigator Dr. Brid Ryan of the National Cancer Institute, who showed Jesse what cancer cells look like under a microscope and discussed interventions and treatments.

After the tour, the family collected plenty of goodies and NIH swag. Jesse is sure to benefit from what he learned this summer at NIH. He will deliver a presentation about his visit when he returns to school in the fall, while Brianna, at Bishop's urging, now considers science a potential career option.

NIMHD's Hunter thinks Jesse will be an inspiration to many young students of color who want to pursue a career in biomedical science.



"Oh wow, these really work!" said Samira Rashid (l) of NLM as she gazed at the eclipse near Bldg. 38A. Center, Dr. James C. Yang, a senior investigator in NCI's Surgery Branch, captured this photo in Newberry, S.C., which was along the path of totality stretching from Oregon to South Carolina. At right, Mike Krzywanos of NLM tries out his homemade cardboard eclipse viewer, which he crafted earlier in the day.

Eclipse

CONTINUED FROM PAGE 1

"NCBI filters are clean!" quipped Dr. David Landsman, an NCBI senior investigator, with a laugh.

Only moments before maximum eclipse at 2:42, a large gray cloud obscured the sun, prompting disappointed lowing from the crowd. But within 4 minutes, the sun re-emerged to cheers.

Before the eclipse ended at 4:01, there had been a downpour—a sun shower, actually—that soaked at least part of campus. Nature was keen on showing its versatility.—**Rich McManus**

Things Were Looking Up

Cell phones, cereal boxes, tin foil and cardboard contraptions as well as specially filtered telescopes, binoculars and cameras. For one afternoon at NIH, a majority of things seemed focused on the skies as the first total solar eclipse since 1979 began to unfold across the U.S.

Setting up a picnic station beneath the flag pole at Paul Rogers Plaza in front of Bldg. 1, a group from the Worm Lab swapped several models of eclipse-viewing glasses, comparing views of the sun. "We're taking a lab break," explained one group member. "Yeah, a lab break," agreed another, smiling broadly.

A few yards away on either side, groups tried more low-tech ideas, guided in one case by YouTube do-it-yourself videos.

"Wonder what the degree of luminosity is, with 80 percent coverage?" a curious employee wanted to know. At a science place like NIH, the answer [0.843 magnitude] should have come swiftly and confidently, right? Nope.

"You have to angle it just right," suggested an NCCIH employee, adjusting a cereal box viewer for a clueless reporter in front of Bldg. 2. "There. Can you see it now?"

"Can you see it now" was also the refrain echoing among a group diligently configuring a poster-size cardboard gadget involving duct tape, a tripod and binoculars. With endless patience, good-natured ribbing and lots of humor, the DIY folks attempted to assemble a makeshift eclipse projector. Results were... mixed. Fortunately, most in the group had protective spectacles as backup.

"Everybody got glasses? Okay, have fun and be careful." It sounded like Everymom's cautionary sendoff, but the words actually were launched at about a dozen coworkers spilling out of Bldg. 2, shortly after 2 p.m.

From "Wow!" to "Impressive" to "Spectacular!" NIH'ers' reactions to witnessing a bit of history in the heavens were at once individual and uniform: On eclipse day, everybody loves science.—**Carla Garnett**

'Once in a Lifetime'

At the Children's Inn at NIH, staff and guests donned glasses and watched the eclipse from the inn's parking lot. A little before 2:42 p.m., someone shouted "Here it comes!" At the last minute, clouds obscured the sun, but they parted often enough for everyone to catch a glimpse.

Inn resident Farrah Mackenzie, 11, of Los Angeles, said viewing the eclipse "could be a once in a lifetime opportunity. Although I didn't get to see it completely because of the clouds, it's still a really cool opportunity."

And take it from Farrah—she knows cool opportunities. She stars in the movie *Logan Lucky* alongside Channing Tatum, Adam Driver and Riley Keough.

Another resident, Sophia Hogas, 9, of New Jersey, said it was her "first-time ever" seeing an eclipse. Her parents saw one in Romania



At left, the NIH Office of Intramural Training and Education and other OD staff enjoy a spontaneous eclipse watching party outside of Bldg. 2. At center, who needs high-tech? Staff of NCCIH and NIAID view through cereal boxes. At right, Children's Inn resident Farrah Mackenzie did not want to miss a "once in a lifetime opportunity." **PHOTOS: MARLEEN VAN DEN NESTE, RICH MCMANUS, CARLA GARNETT, DANA TALESNIK, CHILDREN'S INN**

Brad Davidson (l), a fellow in NHGRI's Medical Genetics Branch, views the solar eclipse at its peak using a welding mask. The center image, showing sunspots, was taken through NCBI's Dr. Laks Iyer's telescope by Dr. Gurmeet Kaur, a postdoctoral fellow in NCBI's Computational Biology Branch. At right, Iyer (l) offers views of the eclipse through a telescope he brought to campus. Joining him are (from l) Kaur, Daniel Schaffer, Dr. Aravind Iyer, Taisei, Dr. David Landsman, Dr. Vivek Anantharam and Dr. Arunkumar Krishnan.

once. She also described the experience as "pretty cool."

When it was over, residents went inside for a solar eclipse party, where they decorated cookies, participated in a cakewalk and created art projects.—**Eric Bock**

Camaraderie Shines Bright

Hundreds of NIH'ers gathered on the quad flanked by the Porter Neuroscience Research Center, Vaccine Research Center and NCI's Bldg. 37 on Aug. 21 to watch the solar eclipse, using a variety of gadgets to help protect their eyes.

As momentum was building, so was the crowd, which happily shared disposable solar glasses and other eclipse viewers. Some scientists and fellows used sheets of double-exposed black X-ray film.

Brad Davidson, an NHGRI fellow, brought in a welding mask he borrowed from his father. The view would be cloudy through the mask, he said, but using polarized sunglasses under the mask helped clear up the image.

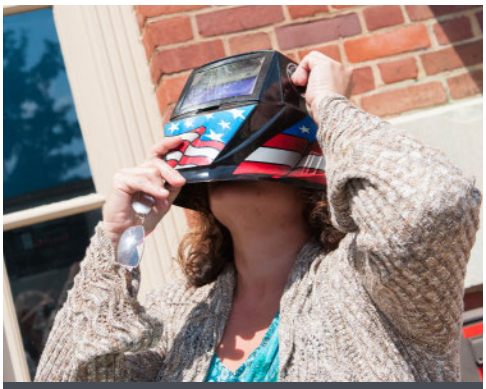
Others viewed the eclipse in a more indirect way. Some put pinholes in a cardboard box and looked at the bright crescent-shaped sun reflected inside the box. One scientist with box in hand excitedly said he had viewed the 2009 eclipse in China the same way. Others stood with no gadgets, their backs to the sun, looking at shadows on the ground behind a tree.

"It was like seeing the phases of the moon go by quickly," said NCI postbac staff scientist Binwu Tang.

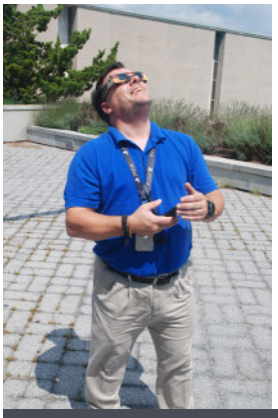
If this was a total eclipse, why didn't the entire sky get dark? "We'd need 95 percent cover for the sky to get dark but here we had 80 percent cover," said NCI senior investigator Dr. Suresh Ambudkar, who viewed the eclipse with his colleagues through solar glasses.

There were collective gasps and shouts at 2:33 when the sun slipped behind the clouds, but it soon emerged brightly to cheers before the 2:42 eclipse peak. "The most fun was the crowd reacting to the rain cloud when it blocked the eclipse [for a short time]," said NCI fellow Hal Baker.

An administrative officer from the VRC, enjoying the experience with her colleagues, exclaimed, "It's a party out here!"—**Dana Talesnik**



The stars and stripes viewer above was almost as cool as "The Deluxe IRTAviewer 3000" modeled below.



At left, NLM's Nick Napoli takes in the eclipse, which he tried to capture on his smartphone. At center, the Worm Lab gathers on the Paul Rogers Plaza for the historic sun show. At right, a do-it-yourself, video-assisted projector is positioned with varying degrees of success.

From left, Aaron Saguil from the F. Edward Hebert School of Medicine at the Uniformed Services University of the Health Sciences, Chenits Pettigrew from the University of Pittsburgh, Judith Ned from Stanford University School of Medicine and Melanie Prusakowski from Virginia Tech's Carilion School of Medicine share advice with students interested in applying to M.D. programs. At right, attendees at the Graduate and Professional School Fair line up to ask speakers questions about graduate school admissions.

PHOTOS: DANIEL SOÑÉ

Grad Fair

CONTINUED FROM PAGE 1

Intramural Training and Education (OITE) at Natcher Conference Center, provided a full day of speakers offering career planning advice as well as information sessions and exhibits on Ph.D. and M.D. programs.

"I felt students needed access to mentors from beyond the NIH," said Dr. Sharon Milgram, director of OITE, who first started the program in 2008. "I wanted to give them access to all of my colleagues across the United States who were happy to give advice and wanted to recruit students."

What's Your 6-Word Memoir?

Dr. Sharon Milgram, director of the Office of Intramural Training and Education, shared some of the sample 6-word memoirs offered by attendees at the recent grad school fair:

Antibiotic resistance, let's not die yet

Ask questions, solve problems, save lives

Becoming a blessing by giving myself

Black girls excel in science too

Daughter of immigrants, seeking health justice

Good science can end health disparities

Lifelong service of medically underserved communities

NMR spectrometry is the best spectrometry

Nothing can contain me, even word counts

Providing culturally sensitive mental health services

Science as service, learning as love

Staying determined no matter the storm

These loans aren't gonna pay themselves

Passionate about science, engineering and food

Despite the draining process of graduate school admissions, post-baccalaureate fellow Bailey Mallon said she found Milgram's plenary talk that morning especially inspiring. Her favorite part? When students were tasked to describe themselves in 6 words, composing a "6-word memoir."

NIH fellows speak with an admissions officer about their interests and receive advice and guidance for considering graduate school options.

Milgram said she had gotten the idea from *Smith* magazine, an online publication dedicated to storytelling. The activity gives people a chance to think about what they value and want for themselves. Milgram's own 6-word memoir was "Great job, can still wear jeans."

About 100 participants in the audience then provided their own 6-word memoirs (see sidebar), sharing a diverse range of answers including "Queer Chicana, here to excel professionally," "Global citizen, work for underserved communities," and "Live now, learn always, be helpful."

"The staff and I all felt touched by the 6-word memoirs," Milgram said. "We need to constantly be saying that this is a big community, but it's also a community that sees everybody's differences and what everybody is proud of. To make science more diverse and more inclusive and welcoming, we need to constantly stress our shared identities as problem solvers, as scientists and as global citizens, while stressing that we each bring really unique experiences."

Joshua Hunt, a post-baccalaureate fellow at the National Institute on Aging, was one of a handful of students who made a special trip to Bethesda from their usual posts in Baltimore.

"It's hard to be aware of all the opportunities. I came here to try to get a better handle on what other opportunities there are out there that I'm not looking into," Hunt said. Now in the second year of his post-bac fellowship, he has already begun searching for graduate school opportunities. Hunt said hearing other students' questions in the sessions helped his understanding of the admissions process.

Ixodes scapularis tick, adult and nymphal forms

PHOTO: NIAID

Scientists Develop Infection Model for Tick-Borne Flaviviruses

NIH scientists have filled a research gap by developing a laboratory model to study ticks that transmit flaviviruses, such as Powassan virus. Powassan virus was implicated in the death of a New York man earlier this year. The unusual model involves culturing organs taken from *Ixodes scapularis* ticks and then infecting those organ cultures with flaviviruses, according to researchers at Rocky Mountain Laboratories, part of NIAID. The researchers say the culture model, described in *mBio*, will greatly increase knowledge about how flaviviruses infect ticks and could become a tool to evaluate medical countermeasures against tick-borne viruses.

Flaviviruses are the cause of diseases spread by mosquitoes (e.g., dengue fever and West Nile fever) and by ticks (e.g., Powassan virus disease and tick-borne encephalitis). Powassan virus and the closely related deer tick virus are the only flaviviruses known to be spread by ticks in North America.

The NIAID scientists developed their model by dissecting three tick organs—the midgut, salivary glands and nervous tissue—and then culturing flaviviruses in those organs, evaluating their viability over several days. They found that Powassan virus and the related Langat virus could infect and spread in salivary glands and midgut. Langat virus is found typically in Southeast Asia and is an ideal model virus for study because it causes only rare, mild infections in people.

Female Mouse Embryos Remove Male Reproductive Systems

A protein called COUP-TFII determines whether a mouse embryo develops a male reproductive tract, according to researchers at NIH and their colleagues at Baylor College of Medicine. The discovery, which appeared online Aug. 18 in the journal *Science*, changes the long-standing belief that an embryo will automatically become female unless androgens, or male hormones, in the embryo make it male.

Dr. Humphrey Hung-Chang Yao, head of the NIEHS reproductive developmental biology group, studies how male and female mouse embryos acquire their sex-specific reproductive systems. He said all early-stage mammalian embryos, regardless of their sex, contain structures for both male and female reproductive tracts. For a mouse or human to end up with the reproductive tract of one sex after birth, the other tract has to disintegrate.

"I learned in graduate school that androgens are needed to maintain the male reproductive tract, but our work finds that maintenance of the male reproductive tract can be achieved without androgen," Yao said.

Since the 1950s, scientists have believed that androgens produced by embryonic testes, promote the survival of the male reproductive tract. The scientific consensus favored a female by default scenario, in which the absence of androgens in female embryos resulted in the breakdown of the male reproductive tract. However, Yao's work demonstrated that female embryos actively promote the elimination of the male tract through the action of COUP-TFII, challenging the female-by-default theory.

Specialized Mouse Neurons Play a Unique Role in Pain

Researchers from NIH have identified a class of sensory neurons (nerve cells that electrically send and receive messages between the body and brain) that can be activated by stimuli as precise as the pulling of a single hair. Understanding basic mechanisms underlying these different types of responses will be an important step toward the rational design of new approaches to pain therapy. The findings were published in *Neuron*.

"Scientists know that distinct types of neurons detect different types of sensations, such as touch, heat, cold, pain, pressure and vibration," said Dr. Alexander Chesler, lead author of the study and principal investigator with NCCIH. "But they know more about neurons involved with temperature and touch than those underlying mechanical pain, like anatomical pain related to specific postures or activities."

In this study, Chesler and his colleagues used a novel strategy that combined functional imaging (which measures neuronal activity), recordings of electrical activity in the brain and genetics to see how neurons respond to various stimuli. The scientists focused on a class of sensory neurons that express a gene called Calca, as these neurons have a long history in pain research.

The scientists applied various stimuli to the hairy skin of mice cheeks, including gentle mechanical stimuli (air puff, stroking and brushing), "high-threshold" mechanical stimuli (hair pulling and skin pinching) and temperature stimulation. They found that the target neurons belong to two broad categories, both of which were insensitive to gentle stimulation. The first was a well-known type of pain fiber—a polymodal nociceptor—that responds to a host of high-intensity stimuli such as heat and pinching. The second was a unique and previously unknown type of neuron that responded robustly to hair pulling. They called this previously undescribed class of high-threshold mechanoreceptors (HTMRs) "circ-HTMRs," due to the unusual nerve terminals these neurons made in skin. They observed that the endings of the fibers made lasso-like structures around the base of each hair follicle.

"These findings add insight into how the somatosensory system encodes pain," said NCCIH director Dr. Josephine Briggs. "Learning more about the distinctive features of circ-HTMRs could contribute to rapid, accurate localization of brain regions activated in mechanical pain, and ultimately to the rational design of new approaches to pain therapy."

Mice Study May Lead to Discovery Of Broad-Spectrum Antiviral

After herpesviruses infect a cell, their genomes are assembled into specialized protein structures called nucleosomes. Many cellular enzyme complexes can modulate these structures to either promote or inhibit the progression of infection. Scientists studying how one of these complexes (EZH2/1) regulated herpes simplex virus (HSV) infection unexpectedly found that inhibiting EZH2/1 suppressed viral infection. The research group, from NIAID, then demonstrated that EZH2/1 inhibitors also enhanced the cellular antiviral response in cultured cells and in mice. The work was reported in *mBio*.

Once a person has been infected with a herpesvirus, the virus persists in a latent form, sometimes reactivating to cause recurrent disease. Two-thirds of the global population are infected with HSV-1, and at least 500 million are infected with HSV-2, according to the World Health Organization. These viruses cause a range of diseases and conditions from oral cold sores to genital lesions to serious eye infections that can lead to blindness.

People infected with HSV also have an enhanced risk of acquiring or transmitting human immunodeficiency virus (HIV). Treatment usually involves antiviral drugs that interfere with viral replication, but new approaches to combat these infections are needed.

The NIAID group demonstrated that EZH2/1 inhibitors not only suppressed HSV infection, spread and reactivation in mice, but also suppressed human cytomegalovirus, adenovirus and Zika virus infections in cell culture using human primary fibroblast cell lines. The authors suggest that EZH2/1 inhibitors have considerable potential as broad-spectrum antivirals.

Dr. Catherine D. Lewis

NIGMS Mourns Longtime Division Director Lewis

BY CHRIS PALMER

Dr. Catherine D. Lewis, former director of the NIGMS Division of Cell Biology and Biophysics (CBB), died on July 12.

Throughout her 34 years at NIH, she was widely recognized for her scientific foresight and leadership, including the early recognition of important emerging research opportunities in molecular biology, biophysics and microscopy.

Lewis earned a B.S. in psychology from Columbia University, then an M.S. and Ph.D. in biochemistry from Princeton University. She joined NIH in 1983 as a staff fellow at NIDDK in the lab of Dr. Gary Felsenfeld, where she studied chromatin structure and the regulation of beta-globin gene expression during development.

In 1989, Lewis moved to NIGMS as a program director in the Genetics Program Branch (which later became the Division of Genetics and Developmental Biology), where she managed grants on cell nuclear structure and function and was instrumental in the development of programs focused on epigenetic regulation.

Eight years later, Lewis became Biophysics Branch chief in CBB. In that role, she managed up to 400 grants, some of which led to breakthroughs such as the structure of the ribosome. She also reorganized the portfolios of the branch to focus on biological problems rather than on the specific methods for studying those problems. In addition, she initiated NIGMS programs focused on new single-molecule methods and nanotechnology.

Lewis received NIH Director's Awards for her work on the NIH Bioengineering Consortium, the NIH nanoscience working group and for participation in the Science Alliance Program, which seeks to improve the quality of science education in elementary schools.

In 2006, Lewis became acting, then permanent director of CBB, a position she held until her retirement in January. During this period, she oversaw changes in the direction of the NIGMS Protein Structure Initiative, promoted advances in high-resolution optical microscopy and cellular imaging and led efforts to support atomic resolution cryo-electron microscopy, including a new Common Fund initiative.

"Cathy was very well liked by her colleagues. Why? She was self-effacing, encouraging, supportive, even-handed, tolerant and always available and willing to join in," says acting CBB division director Dr. Peter Preusch.

Over the years, Lewis was active in training other NIH extramural staff members and had served on numerous personnel search and process planning committees.

"Cathy was not only a wonderful colleague, but first and foremost a truly dedicated mentor. She was generous with her time and her abilities; a rare blend of compassion and forthright honesty," said NIGMS Biomedical Technology, Bioinformatics and Computational Biology division director Dr. Susan Gregurick. "I think her impact will continue to have vibrations in many peoples' careers."

Lewis's door was always open to all and her advice was constantly sought by colleagues, not only in her own division, but widely across NIGMS and NIH. "Cathy regarded and treated everyone as a colleague, a reflection of her respect and appreciation for individuals and their contributions," said Cell Biology Branch chief Dr. Jim Deatherage.

Lewis is survived by daughter Christine and son Jonathan Selzer and her partner Vince Cannistraro.

Environmental Researcher Needleman Mourned

Dr. Herbert Needleman, a physician-scientist who published groundbreaking research on lead toxicity in children, died July 18. The Philadelphia native was 89 years old and died of Alzheimer's disease.

Dr. Herbert Needleman

NIEHS and National Toxicology Program director Dr. Linda Birnbaum said Needleman, a long-time NIEHS grantee, was a giant in the scientific community and started his research at a time when many people were not paying attention to how substances in their surroundings could affect their lives. "Needleman and other researchers like him were on the forefront of modern environmental health research," she said.

Needleman, a professor at the University of Pittsburgh, had the ingenious idea to measure lead in children's baby teeth after they had fallen out, as an alternative to performing bone biopsies, which was out of the question. He and his collaborators found that inner-city children had 5 times as much lead in their teeth as their suburban counterparts. Further work determined that children with higher lead levels had lower IQ scores, as well as behavioral issues.

"Herb gave us a validated working model to reliably connect environmental exposure to a disease or health outcome," said Dr. William Suk, director of the NIEHS Superfund Research Program. "After he published his lead toxicity work, the National Academy of Sciences emerged with what is, in essence, the model he developed."

Needleman served on the science committee of the Children's Environmental Health Network, a national organization committed to protecting children from environmental health hazards. CEHN is a partner organization of the NIEHS Partnerships for Environmental Public Health.

His findings, in part, led the U.S. government to ban lead from gasoline, a law that is credited with drastically reducing blood lead levels in American children.—**Wendy Anson**

NINDS Mourns Scientist Emeritus Kopin

BY SHANNON E. GARNETT

Dr. Irwin J. "Irv" Kopin, scientist emeritus and retired scientific director, NINDS, died on Aug. 1 at age 88.

Kopin was a giant in catecholamine research. His groundbreaking work on the characteristics and metabolism of catecholamines—a class of chemicals that includes adrenaline, norepinephrine and dopamine—provided the backbone for major advances in neurological and psychiatric disorders.

Born in 1929, Kopin graduated from the Bronx High School of Science in New York in 1946. He attended the City College of New York for 2 years and then transferred to McGill University in Canada, where he earned his bachelor of science in biochemistry in 1951 and his medical degree in 1955.

During his second year of medical residency at Boston City Hospital, he joined the Public Health Service and was assigned as a statistician on a tuberculosis research team.

Kopin began his NIH career as a research assistant in the Laboratory of Clinical Science (LCS) at NIMH

Dr. Irwin J. "Irv" Kopin

in 1957, under the direction of Dr. Seymour Kety. Kopin left NIH briefly in 1960 to finish a 1-year medical residency at Columbia-Presbyterian Medical Center. Upon completion, he immediately returned to LCS as a clinician-scientist. In 1969, he became LCS chief, a position he held until 1983. He led the lab during the early days of neuropsychopharmacology, side by side with renowned scientists such as Nobel laureate Dr. Julius Axelrod and Kety.

With Axelrod and others, Kopin published numerous research articles dealing largely with the disposition and metabolism of catecholamines.

Kopin proposed the notion of false neurotransmitters, referring to a chemical compound that mimics the action of a neurotransmitter. He also showed that the chemical 1-methyl-4-phenyl-1,2,5,6-tetrahydropyridine rapidly produces a "time-telescoped" form of Parkinson's disease. This finding was not only pivotal for Parkinson's research but also provided a key link to neurology for Kopin.

In 1983, then-NINDS director Dr. Murray Goldstein appointed Kopin scientific director of NINDS, a position he held for 11 years, until 1994. During this time, he also served as chief of the Clinical Neuroscience Branch until 1999.

With his broad knowledge of neuroscience and medicine, Kopin strengthened both the basic and clinical neuroscience programs at NINDS. He was collaborative in his managerial duties as well, and he developed a novel and effective NINDS administrative triad with Dr. Mark Hallett, who was the clinical neuroscience director, and Dr. Ernst Freese, who was the basic neuroscience director and chief of the Laboratory of Molecular Biology, and later, Dr. Harold Gainer, who became basic neuroscience director after Freese.

"Irv was very bright, allowing him to have a good and broad understanding of all the activities in the institute," said Hallett. "This allowed him to judge what research should get supported. He was always fair and transparent. He used to say that he needed to be honest all the time because his memory wasn't good—not true of course—so that he wouldn't ever contradict himself. His intelligence came out in interesting ways. For example, he was in charge of controlled substances in NINDS, which were kept in a safe. When he went on vacation, I was his deputy, so I had to know how to open the safe. The code was the first part of the Fibonacci sequence." [The Fibonacci sequence is a series of numbers in which each number after the second number is the sum of the two preceding numbers.]

Kopin officially retired in 1999 and became a scientist emeritus and active participant in NINDS's clinical neurocardiology section until just before his death.

Throughout his career, Kopin demonstrated an unflagging commitment to the NIH mission and more generally to advancing medical scientific knowledge. He served on numerous committees, participated on many scientific advisory boards and served as a co-editor or editorial board member for more than 20 scientific journals. His awards included the PHS Distinguished Service Medal in 1980 and 1990, an honorary membership in the Royal Society of Medicine in 1993 and the Paul Hoch Award for Distinguished Service in 2004.

He authored or co-authored more than 730 articles, reviews and book chapters. He continued to publish papers vigorously during his retirement, with the last appearing this past May.

Kopin was a mentor and role model for scores of postdoctoral researchers, many of whom now occupy key positions in academic medicine or the pharmaceutical industry. His collaborations with leaders in the field provided the foundation for much of what is known today about catecholamine systems, both inside and outside the brain.

Dr. David S. Goldstein, chief of the NINDS clinical neurocardiology section, was one such person touched by Kopin: "I had the privilege of knowing and working with him for over 35 years. Our typical style of communication was debate, in the best Talmudic tradition of the 'chevrusah,' or learning partner. Together we argued about interpretations of the data, experiments that should be done, conceptual models, getting the historical facts straight and, most recently, about how to link genetics and molecular biology with integrative physiology. In the dedication to a book I wrote recently, I referred to Irv as 'an example of intellectual rigor, productivity, perspective and integrity, an inspiration throughout my career at the NIH.' I look at his empty desk in the lab and, while of course saddened, I also feel thankful and honored that he was my medical scientific chevrusah for so many years."

Kopin is survived by his wife Rita, his son Alan, daughters Gail and Judye, and 8 grandchildren. The family asks that memorial contributions may be made to Congregation Beth El, the Dana-Farber Cancer Institute or to MAZON—A Jewish Response to Hunger.

People with Anxiety Needed

NIMH is studying people with anxiety and how they respond to stressful events. Researchers are seeking those with general anxiety, panic and/or social anxiety disorder. Study requires one to two outpatient visits to the Clinical Center. Compensation will be provided. For more information, email anxiety@mail.nih.gov or call 1-866-444-2214 (TTY 1-866-411-1010) and refer to study 03-M-0093.

NIMH Needs Healthy Volunteers

NIMH is studying how an experimental drug (vasopressin) affects the brain and body when healthy volunteers feel anxious. Researchers are seeking healthy volunteers without mental health disorders. Four outpatient visits to the Clinical Center are required. Compensation will be provided. For more information, call (301) 402-4961 or email nimhhealthyvolunteer@mail.nih.gov and refer to study 17-M-0046.

Stress Study Seeks Volunteers

NIMH is studying how the brain and body respond to stressful events. Researchers are seeking healthy volunteers without mental health disorders. Study requires 1-4 outpatient visits to the Clinical Center. Compensation will be provided. For more information, call (301) 402-4961 or email nimhhealthyvolunteer@mail.nih.gov and refer to study 01-M-0185.

Healthy Females Needed

NIDDK seeks healthy Caucasian females, 18-35 years old, with a BMI (body mass index) of 18.5-25 (calculate your BMI at http://go.usa.gov/xNd56) to participate in a research study. Doctors want to learn how the body burns energy at different temperatures. You will have an 8- to 11-day inpatient stay at the Clinical Center. Compensation is provided. Call the Office of Patient Recruitment at 1-866-444-2214 (TTY 1-866-411-1010). Read about the study at https://go.usa.gov/xNdks. Refer to study 12-DK-0097 (cohort 4).

NIAID Seeks Healthy Adults

Healthy adults 18 to 50 years old are needed to participate in the study of an investigational RSV (respiratory syncytial virus) vaccine. RSV is the most common cause of respiratory and lung infection in infants and older adults and there is no vaccine to prevent it. The study will evaluate the safety of the vaccine and its ability to generate an immune response. Financial compensation will be provided. To volunteer, call 1-866-833-LIFE (toll-free) or TTY 1-866-411-1010 or email vaccines@nih.gov. Refer to study 17-I-0058.

Students from across the U.S. recently visited NIH as part of NCI's Undergraduate Research Conference. The interns were supported by the Undergraduate Summer Research Program, now in its 10th year.

NCI Hosts Summer Undergrad Research Interns

The National Cancer Institute's Division of Cancer Biology hosted 19 students from across the country for an Undergraduate Research Conference recently.

The students were completing cancer research internships at grantee institutions who are members of the division's Cancer Systems Biology Consortium and Physical Sciences in Oncology Network.

The interns were supported by the Undergraduate Summer Research Program, which provides a stipend to conduct research in the interdisciplinary fields of cancer systems biology or physical oncology.

While the students spent most of the summer in a lab conducting research on topics such as tumor heterogeneity, tumor-immune interactions, evolution of phenotypes in late-stage cancer and cell migration's role in cancer invasion and metastasis, the in-person meeting on campus gave the students the opportunity to meet and teach one another about the diverse set of projects and disciplines that are studied by investigators.

The conference also included a collaborative activity based on the Sage Bionetworks-DREAM Breast Cancer Prognosis Challenge, a tour of the Clinical Center and the opportunity to meet and learn from the Georgetown Breast Cancer Advocates, a group of breast cancer survivors whose lives are a testament to the importance of cancer research.

The students also had a chance to meet scientists and present their work via a poster session to fellow interns, researchers and NCI staff.

Now in its 10th year, the Summer Undergraduate Research Program has supported more than 110 undergraduate students to explore experimental and computational research in interdisciplinary fields. The program serves as a nationwide resource for the benefit of the entire cancer biology research community by encouraging future researchers to pursue collaborative, multi-disciplinary approaches to complex problems.

Addiction Science Awardees Present at NIDA

The 2017 winners of NIDA's Addiction Science Awards, part of the Intel International Science and Engineering Fair (ISEF), presented their projects to NIDA scientists recently. They also toured the NIH campus as well as the NIDA IRP Bayview facility in Baltimore.

This is the 10th year of the Addiction Science Awards, which are coordinated by NIDA as well as Friends of NIDA, a private group dedicated to furthering NIDA's mission. ISEF is the world's largest science competition for high school students.

To mark the occasion, Carol Krause, chief of NIDA's Public Information Liaison Branch, gave a special "Where Are They Now?" presentation. It included excerpts from previous award winners describing how the award has inspired them. In attendance was NIDA's first winner, Kapil Ramachandran, who is now a Ph.D. candidate in neuroscience at Johns Hopkins University.

KSFY-TV (ABC affiliate in South Dakota) covered the event and interviewed third-place winner Kashfia Rahman as well as Dr. Jack Stein, director of the Office of Science Policy and Communications. This was Rahman's third time winning the award.

For information on current and previous award winners, visit https://www.drugabuse.gov/news-events/public-education-projects/nida-science-fair-award-addiction-science.

On hand at the award ceremony are (front, from l) NIDA's Dr. Jack Stein, 2017 Intel Science Fair winners Nkima Stephenson, Kashfia Rahman and Anusha Zaman and NIDA's Carol Krause. At rear are (from l) 2008 Intel Science Fair winner Kapil Ramachandran and Friends of NIDA's Drs. Bill Dewey and Charles O'Keeffe.