

## NCI Biologist Invents Safer Pepper Spray

BY ERIC BOCK

*This story is part of an exclusive, ongoing series on NIH inventors.*

An NCI scientist has invented a safer pepper spray for use by law enforcement and for personal protection.



IMAGE: ALPHASPIRIT.IT / SHUTTERSTOCK

Larry Pearce, a biologist in NCI's Laboratory of Cancer Biology and Genetics and, his co-inventor, retired NCI investigator Dr. Peter M. Blumberg, developed a pepper spray that, when administered, causes a painful stimulation and incapacitates a person for only a brief period.



NCI's Larry Pearce

"We can now offer a product that works to alleviate pain, but only for a brief period of time, for more effective riot control and other self-defense measures

SEE **PEARCE**, PAGE 4

## RECOVER REACHES NEW MILESTONE

### Long Covid Clinical Trials Launch, Enrollment Opens

Although the coronavirus pandemic is largely behind us, there's still a significant number of people dealing with some residual effects of Covid-19—a condition generally referred to as "long Covid."

On July 31, NIH launched phase 2 clinical trials that will evaluate at least four potential treatments for long Covid, with additional clinical trials to test at least seven more treatments expected in the coming months.

"Our goal is to figure out why and how some people experience these long-lasting symptoms and to identify treatments that could help," said Acting NIH Director Dr. Lawrence Tabak, at a briefing about the launch. "Ultimately, we want to prevent,

SEE **RECOVER**, PAGE 10



New zebrafish postage stamp issued.

IMAGE: U.S. POSTAL SERVICE

## 'LIFE MAGNIFIED'

### NIH Zebrafish Research Featured on Postage Stamps

A microscopy image created by NIH researchers is part of the "Life Magnified" stamp panel issued Aug. 10 by the United States Postal Service (USPS).

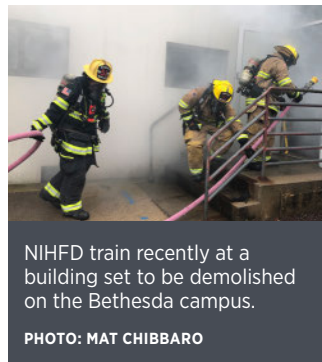
The NIH zebrafish image, which was taken to understand lymphatic vessel

SEE **ZEBRAFISH**, PAGE 8

## Fire Department Celebrates 70th Anniversary

BY MAT CHIBBARO

In 1953, two milestones occurred on the NIH Bethesda campus: the opening of the Clinical Center (CC) and the inception of the NIH Fire Department (NIHFD). The two



NIHFD train recently at a building set to be demolished on the Bethesda campus.

PHOTO: MAT CHIBBARO

events were interrelated, as leadership saw the need for its own protection from fires and medical emergencies. NIHFD has humble beginnings.

Initially the department consisted of two full-time personnel and a single fire engine (equipped with water, a pump and hose lines)

SEE **DFRS**, PAGE 6



Tacy Foundation artists perform for CC patients, staff and visitors. See p. 12.

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### NHLBI Adds New ‘Research Topics’ Page to Website

The National Heart, Lung and Blood Institute (NHLBI) recently added a new page to its website that shares the institute’s research topics in a consolidated location. The new “Research Topics from NHLBI” features the latest research on heart, lung, blood and sleep conditions.

Dive into each topic to learn more about innovative treatments, advances in management strategies and the latest breakthroughs in prevention research from labs at and funded by NHLBI. Learn more about these groundbreaking studies at <https://go.nih.gov/l3xyHQO>.



In 2019, the NIH Dental Clinic prepared a meal for families staying at the Children’s Inn.

PHOTO: CHIA-CHI CHARLIE CHANG

### Inn’s Family Dinner Program Returns

The Family Dinner Program is back at the Children’s Inn at NIH and help is needed.

For the first time since 2019, volunteers are invited to help prepare meals in-house using the inn’s indoor kitchen and outdoor grilling patio.

After three years with reduced capacity, the inn is now once again full of children, teens, young adults and their families who have come to NIH to participate in groundbreaking studies and treatments.

The family dinners have always been a favorite activity, providing comfort and nourishment to individuals facing challenging circumstances. The program also offers a rewarding and uplifting experience for volunteers.

Groups of up to 12 volunteers ages 18 and over are welcome to sign up. All meals must be either prepared at the inn using food supplied by your group or catered.

Inn staff members are happy to speak with potential groups to develop meal ideas. Volunteer-hosted family dinners typically take place nightly, Monday through Thursday, with arrival for volunteers as early as 3 p.m. and cleanup by 7 p.m.

For details, visit: <https://tinyurl.com/32t7un4n>.



Santa, with families from the Children’s Inn, in front of a mural celebrating reading at Rio Lakefront

### Inn Celebrates Christmas in July

Christmas came early for residents of the Children’s Inn at NIH. On July 19, Santa and his elves—members of the NIH and Montgomery County police departments—escorted two shuttle buses full of residents and their families from NIH to Rio Lakefront in Gaithersburg.

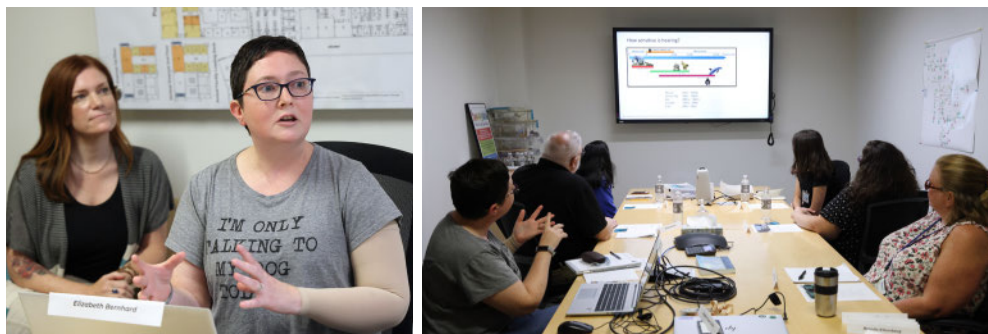
At Rio, the group visited Target to shop for toys and other gifts. Each family was paired with an officer from Montgomery County. Many residents shopped not only for themselves but also for friends, siblings and other family members. Afterward, the families and officers ate dinner at Miss Toya’s Southern Kitchen.



“Holiday” shopping spree (above, from l): Each family was paired with an officer. They were free to roam around the store. The toy and clothing sections proved to be the most popular stops. At center, Avery and her father, Shawn, are interviewed by FOX 5’s Gwen Tolbart about the inn’s Christmas in July event. Officers from the Montgomery County Police Department helped families shop for presents. Below, families ate dinner at Miss Toya’s Southern Kitchen, where co-founders Jeffery and Toya Miskiri hosted the group and provided a buffet meal.

PHOTOS: THE CHILDREN’S INN AT NIH





At left, NIDCD biologist Liz Bernhard (r), with OACU's Heather Smith in the background, presents to a room of attentive listeners.

PHOTOS: CHIA-CHI CHARLIE CHANG

## CURIOUS ABOUT SCIENCE WRITING Students Visit with OACU

BY AMBER SNYDER

NIH's Office of Animal Care and Use (OACU) opened its doors to two high school science writers on July 13. Tara Prakash and Nora Pierce are participants in Curious Science Writers (cSw), a program hosted by Americans for Medical Progress (AMP) that pairs high school students with mentors as the aspiring scribes research and write their own articles.



Above, Dr. Lorna Role (r) emphasizes the importance of communication from a researcher's perspective. Dr. Nina Lichtenberg (l) and Smith (c) look on. Below, cSw participants included (back row, from l) Nora Pierce, Jennifer Huber, Dr. Heather Narver, Ed Czarra and cSw mentor Michael Newman of Johns Hopkins University, (middle row) Lichtenberg, Dr. Brenda Klaunberg, cSw mentor Carrie Gibson of AMP, OD science writer Amber Snyder and Smith, and (bottom row) Bernhard and Tara Prakash.



Students in the program had the opportunity to attend site visits at other locations, but these local Bethesda students were treated to a day of educational lectures culminating in a facility tour. The focus of the day? The whys and wherefores of animal-based research at NIH.

Lecturers from several institutes in the Bldg. 35 Shared Animal Facility spoke to the students about NIH research and the roles animals play in it, and the importance of communicating research to the public. The event also featured presentations from NIH science writers.

"Science isn't finished until it's communicated," emphasized Dr. Nina Lichtenberg, a science writer at the National Institute of Neurological Disorders and Stroke (NINDS).

Students also heard from event organizer and OACU Associate Director Heather Smith; Dr. Heather Narver, NINDS animal program director; Ed Czarra, NINDS animal resources program administrator; Dr. Brenda Klaunberg, NINDS animal imaging program director; NIDCD biologist Liz Bernhard; and Dr. Lorna Role, NINDS senior investigator and former scientific director of the institute.

"It was so cool to see a selection of the different research opportunities at NIH!" Prakash, who attends Sidwell Friends, enthused. "I didn't realize people of so many backgrounds and experiences could work together in the same institute."

The students were also impressed to both learn about and observe the standard of care for research animals at NIH. The presenters "showed a genuine respect and attention

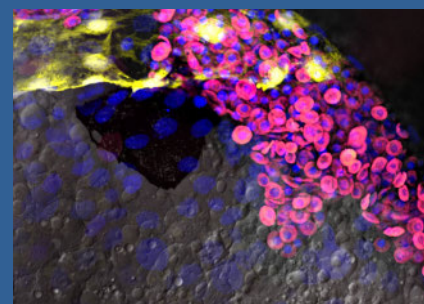
to detail for...the animals in their care," Pierce, who attends Montgomery Blair High School, observed.

Role, a senior investigator in NINDS's circuits, synapses and molecular signaling section, shared how she learned on the fly to engage with the media after news of her lab's research paper on the mechanisms of nicotine addiction went "old-school viral" in 1995.

"Tell [your audience] what you're going to tell them, then [actually] tell them and then tell them what you told them," she advised. "Clarity matters a lot."

Even with the diversity of expertise in the speakers, everyone agreed on the importance of clear, accessible science communication.

"Now it's up to you, cSw," said Role. **R**



ON THE COVER: Zebrafish are an excellent model for studying the development of blood cells and blood vessels. This image shows blood cells (magenta) in blood vessels (yellow) on the yolk of an anesthetized, two-day-old, transgenic zebrafish embryo, which is about the size of a grain of rice. The image was taken using a powerful microscope that uses lasers to illuminate the fish.

IMAGE: DANIEL CASTRANOVA, WEINSTEIN LAB/NICHD

### 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 [nihreford@nih.gov](mailto:nihreford@nih.gov).

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Participants in NCI's Deaf Scientist Training Program (from l) Larry Pearce, Alina Kenina and Megan Majocha communicate via American Sign Language in Dr. Kent Hunter's NCI laboratory. Pearce, an alumnus of the program, was hired as a full-time staffer. Kenina is a DSTP fellow. Majocha, also a program alumna is currently a graduate student at Georgetown University. She continues to work at NIH through the Graduate Partnership Program.

## Pearce

CONTINUED FROM PAGE 1

without resulting in a permanent injury," said Pearce.

Pepper sprays contain capsaicin, a potent chemical irritant. It's the active component of chili peppers, said Pearce. Capsaicin makes peppers taste hot. The compound has also been used in traditional medicine to alleviate joint and muscle pain.

Current pepper sprays on the market have several drawbacks, he explained. They cause pain for excessively long periods of time and might be life threatening for people who have asthma or hypersensitive airways. In extreme cases, the sprays could lead to permanent blindness, asphyxiation and pulmonary edema.

The NIH inventors added a slow-acting antagonist to counteract the noxious effects of capsaicin to pepper spray. They intended to turn their idea into a manuscript and a patent. They wanted to own a patent that would be useful and, potentially, save lives. This problem seemed to be a natural extension of what he was doing, so something Pearce could also do on the side.

"The idea, of course, was to allow enough time for law enforcement officials, for example, to incapacitate or immobilize the recipient/suspect—normally under 4 minutes—before the effect of capsaicin is suppressed by the slow-acting antagonist," he explained.

It took Pearce more than six months to identify a suitable compound following a series of in-depth analyses. It had to be non-toxic, have short-enough half-life and a slow-enough response rate independent of capsaicin dose and be commercially available.

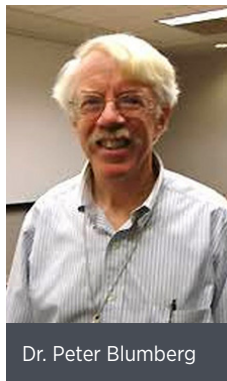
The team first applied for a patent on their invention in March 2010. They were assigned a patent a year later with the publication date on Mar. 8, 2016.

A company in Canada licensed the rights from NIH, which holds the rights for inventions made by its employees. (A chili-pepper birdseed that's squirrel-proof is another invention from that group that has been licensed.)

"Peter and I also thought about doing a species-specific pepper spray," such as dog repellent for postal workers, and deer and rabbit sprays to protect crops, he recounted. "But we never got that far."

Pearce started his career at NIH in 2003 as a postbaccalaureate in Blumberg's lab after he graduated from Gallaudet University

with a biology degree. There, the postbac studied capsaicin and its effects on cancer cells. The researchers demonstrated that therapeutic doses of capsaicin can induce apoptosis, or the process of programmed cell death, in several types of cancer cells, including colon, pancreatic and prostate. Capsaicin appears to have a deleterious effect on dysfunctional mitochondria, but it also seems to play a role in the production of



Dr. Peter Blumberg

new mitochondria, also known as mitochondrial biogenesis.

His more than 50 publications represent cutting-edge contributions to the understanding of the pharmacology of the capsaicin receptor, TRPV1, an area the importance of which was highlighted by the 2021 Nobel Prize to David Julius.

In certain conditions, capsaicin can also induce autophagy to prevent the proliferation and continued survival of senescent cells, which can no longer divide, but continue to function. Autophagy is the

process by which a cell breaks down and destroys old, damaged or abnormal proteins and other substances in its cytoplasm.

Remarkably, only cancerous cells appear to be susceptible to the apoptotic effects of capsaicin. "We still aren't sure why that is," he said.

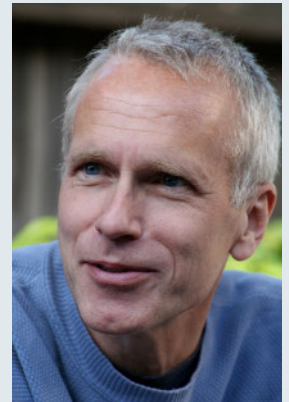
Pearce shifted his focus to cancer metastasis after he moved to Dr. Kent Hunter's lab following Blumberg's retirement in 2018. While he no longer studies it, "I still find research on capsaicin to be fascinating. I look forward to learning about new discoveries and advances in the field!" **R**

Sept. 11

## NIDCR Marks 25 Years of FD/MAS Research

NIDCR will host a symposium on Monday, Sept. 11, to celebrate the institute's 25 years of progress to understand and treat fibrous dysplasia/McCune-Albright syndrome (FD/MAS), a rare disorder that affects the skeleton, skin and endocrine system.

Among the speakers will be Dr. Brian Kobilka, who received the 2012 Nobel Prize in Chemistry for his work on G-protein-coupled receptors.



Dr. Brian Kobilka

PHOTO: CHARLES PARNOT

The symposium will take place from 9 a.m. to

12:30 p.m. in Lipsett Amphitheater, Bldg. 10 and will be followed immediately by a reception and historical poster session on the FAES terrace, Bldg. 10, from 12:30 p.m. to 3 p.m.

Leading scientists and clinicians in the field will trace the progress of NIH FD/MAS research from the 1990s to the present and will offer updates on ongoing basic, translational and clinical studies. Attendees will also hear from patients and patient advocates.

This symposium is part of NIDCR's year-long slate of anniversary-related events. For more information, including a detailed agenda and a videocast link, visit the event webpage at: <https://tinyurl.com/yc44ckjn>.

For a full list of anniversary activities, visit <https://www.nidcr.nih.gov/about-us/75years>.



NIDCR officially launched a year-long celebration of its 75th anniversary on June 27 with a symposium, “NIDCR at 75: Celebrating the Past, Charting the Future.” Shown at the event are (from l) Tim Leeth, Dr. Natalia Chalmers, Dr. Laurie McCauley, Dr. Jennifer Webster-Cyriaque, Dr. Francis Collins, Casey Hannan, Dr. Rena D’Souza, Dr. Karen West, Robert Burns and Dr. George Shepley.

PHOTOS: NIDCR

## NIDCR Symposium Celebrates 75 Years of Research

BY MICHAEL SOMES

During World War II, rampant tooth decay in the U.S. disqualified nearly 20% of eligible recruits from military service. To address this issue, President Harry Truman signed legislation on June 24, 1948 to create what would eventually become the National Institute of Dental and Craniofacial Research (NIDCR).

Over the past 75 years, NIDCR has propelled cutting-edge science on the oral

microbiome, pain, health disparities, oral cancer, tissue regeneration, craniofacial development and genetics, and the biology of saliva and the salivary gland.

NIDCR officially launched a year-long celebration of its 75<sup>th</sup> anniversary on June 27 with a symposium titled “NIDCR at 75: Celebrating the Past, Charting the Future.” The event featured talks by Acting NIH Director Dr. Lawrence Tabak and former NIH Director Dr. Francis Collins as well as NIDCR Director Dr. Rena D’Souza.

University of Michigan Provost Dr. Laurie McCauley presented the keynote address.

The symposium covered the institute’s vital contributions to the biomedical research enterprise, highlighted the state of the science and featured federal partners and professional society representatives describing the critical role of collaboration for achieving oral health for all.

NIDCR Deputy Director Dr. Jennifer Webster-Cyriaque moderated a session that featured the National

Chief Dental Officer, Rear Admiral Michael Windsor Johnson, and representatives from the Centers for Disease Control and Prevention, Centers for Medicare and Medicaid Services and the Food and Drug Administration.

NIDCR first announced its anniversary celebration in March with a symposium at an annual conference for the American Association for Dental, Oral and Craniofacial Research in Portland, Ore.


The event, “Scientific Strides of the NIDCR: 75 Years and Beyond,” featured remarks from three former NIDCR directors—Dr. Hal Slavkin, Tabak and Dr. Martha Somerman—along with current director D’Souza.

A panel discussion followed, featuring NIDCR intramural researchers Dr. Marian Young, Dr. Pamela Robey, Dr. John Chiorini, Dr. Ashok Kulkarni, Dr. Niki Moutsopoulos and Dr. Janice Lee, who described advances in the intramural program over the past decades.



Enjoying NIDCR’s anniversary symposium are (from l) Rear Admiral Michael Windsor Johnson, Chalmers and Webster-Cyriaque.

Concluding the conference symposium, D’Souza described a vision for NIDCR’s next 25 years that included making salivary testing and diagnosis a regular part of medicine and oral health, contributing to a 50% reduction in the prevalence of dental caries, identifying the connections between periodontal disease and systemic conditions, and improving our ability to prevent head and neck cancers.

A recording of the Charting the Future symposium is archived online at <https://videocast.nih.gov/watch=49374>. For information about all of the activities during NIDCR’s year-long anniversary celebration, visit <https://www.nidcr.nih.gov/about-us/75years>. 



University of Michigan’s Dr. Laurie McCauley presents the keynote.



At left, NIHFD staff with one of its first engines; at right, NIHFD tower ladder operating at a house fire in Potomac, Md. on June 15, 2023

## DFRS

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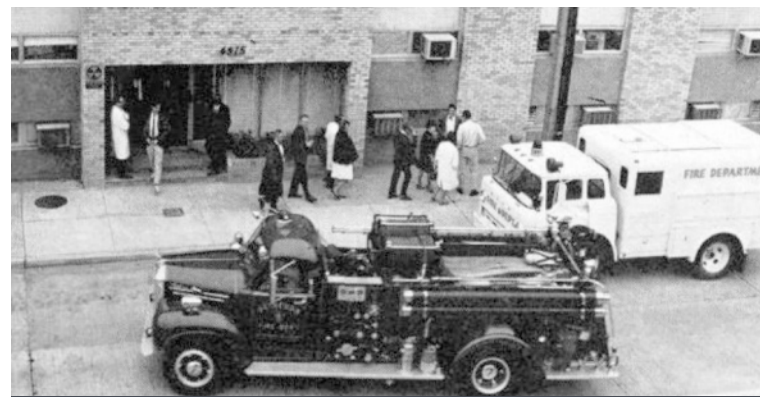
housed in the south campus maintenance area. This was augmented by a system of collateral-duty personnel from maintenance shops. These people volunteered for the additional duties and would be alerted by a bell system to report directly to an emergency while the engine responded from the fire station. This arrangement covered only the weekday working hours. At other times, the Bethesda Fire Department served NIH.

Within two years, the NIHFD staff increased to nine people working shifts and providing 24-hour coverage. In 1955, the first fire chief was named.

Over the years, NIHFD expanded its operations and is now a multi-service modern fire department equivalent to its municipal counterparts in surrounding cities and counties. Organizationally, NIHFD is located in the Division of Fire & Rescue Services within the Office of Research Services in NIH's Office of the Director.

During its early years, in addition to providing emergency response, NIHFD handled fire prevention services. As buildings became more complicated and emergency needs increased, fire prevention duties were separated and are now handled by the NIH Division of the Fire Marshal with a full staff of engineers and inspectors. Fire reporting has been modernized to an automatic electronic system, which reports to NIH's own 911 operations center under the NIH Division of Emergency Management.

NIHFD ambulance service provides basic emergency medical care. With generous financial assistance from the Clinical Center,



Early days for NIHFD. A safety training exercise documented in the *NIH Record*, Nov. 14, 1967

the department's ambulance is now designed and equipped to conduct special transports of patients with highly infectious diseases. NIHFD's uniquely outfitted vehicle was deployed in 2015 to transport an Ebola patient from a nearby airport to the CC for successful treatment.

Given NIH's research facilities, NIHFD has become one of the area's leading

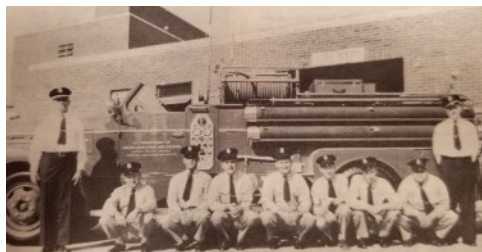
providers of hazardous materials (HAZMAT) emergency response. The department operates a fully equipped HAZMAT vehicle

### Notable Emergencies on NIH's Bethesda Campus

- Bldg. 6 attic fire
- Collapse of garage under construction
- Bldg. 10 fall resulting in a cardiac arrest
- Bldg. 10 lab fires prior to sprinkler installation
- Children's Inn roof collapse
- Bldgs. 29A and 30 transformer fires
- Christmas Eve 2021: seven floods in Bldg. 10
- Bldg. 37 generator fire
- White powder attack on NIAID director



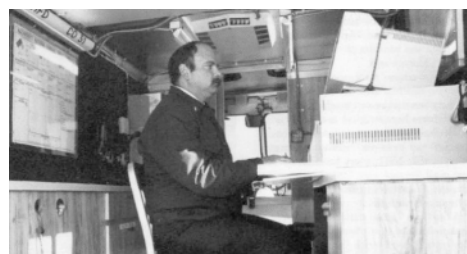
NIHFD's current station (Bldg. 51), HAZMAT unit and tower ladder



**NIHFD in 1955.** Before the opening of the Clinical Center, the Fire Protection Unit consisted of two men, an emergency truck, driven by guards, and firefighting equipment located in all buildings, according to the *NIH Record* July 11, 1955. In November 1953, a 1000-gallon pumper fire engine was acquired, and the Fire Department was expanded and reorganized.

with certified technicians who mitigate such emergencies, which can range from simple spills to large-scale chemical incidents as well as unusual calls like when an unknown substance arrives in a mail package.

In addition to serving NIH's Bethesda buildings and grounds, NIHFD responds to many off-campus calls, supporting the



Above, in 1990, Assistant Fire Chief Gary Hess checks for chemical data through the computer located in a command mobile van designed by the firefighters and used in responding to all emergency calls. Below, members of NIHFD's hazardous material response unit, in 2011



surrounding Montgomery County communities. The mutual aid agreement helps the county with resources and in turn makes county fire & rescue resources available to NIH for incidents requiring more manpower and equipment.

NIHFD also provides a staff member at its Rocky Mountain Lab campus in Montana. This specialist provides emergency medical care and initial HAZMAT capability augmented by the local fire department. He was recently awarded for saving the life of a person experiencing a cardiac emergency.

Today the NIHFD has a staff of 37, many of whom work in rotating 48-hour shifts. Last year, responses totaled 2,456—approaching seven calls per day.

Constantly modernizing, the department is now equipped and trained to provide tactical medical care in the event of a hostile incident, skilled to work alongside the NIH Police Department—tremendous progress since the first days of two firefighters and an engine.

**FRIENDS IN NEED**

**NIHFD Supports County in Mutual Aid Incidents**

Over the years, the NIH Fire Department and the Montgomery County Fire & Rescue Squad have joined forces to respond to several emergencies:

- Rescue of triplets trapped in a Glen Echo house fire
- Rescue of two children in a Kensington fire
- Rescue and revival of a woman trapped in a Potomac house fire
- Bethesda trench rescue involving an electrocution
- Rescue at Silver Spring apartment building explosion
- Fatal fire in illegal tunnel under Bethesda house

**NIMH Kicks Off 75th Anniversary Celebration**

Starting in September 2023, NIMH will celebrate 75 years of transforming the understanding and treatment of mental illnesses. The celebration launches with “The Evolution of Mental Health Research” symposium, which will highlight key advances in mental health research over the past 75 years.

This symposium offers a unique opportunity to gain insights from distinguished thought leaders



NIMH Director Dr. Joshua A. Gordon

and learn how developments in neuroscience, genetics, and behavioral research are leading to exciting discoveries shaping the future of mental health research.

This event will take place on Wednesday, Sept. 13 from 8:30 a.m. to 5:30 p.m. on NIH's main campus. If you cannot attend in person, you can join

the celebration virtually. The event will be recorded and archived.

Register at <https://go.nih.gov/BcMj1Bi>. Registration is required for both in-person and virtual participation.

Event highlights include:

- Opening remarks from NIH leaders, including NIMH Director Dr. Joshua A. Gordon
- Presentations from scientific experts highlighting exciting breakthroughs and discoveries in genetics, imaging, systems, neuroscience, services and interventions
- Discussions with thought leaders in mental health research
- A poster session featuring research conducted by NIMH's Division of Intramural Research Programs

This symposium is the first of several NIMH anniversary events. For more information about the celebration, visit [nimh.nih.gov/75years](http://nimh.nih.gov/75years).



## Zebrafish

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development in the brain, merges 350 individual images to reveal a juvenile zebrafish with a fluorescently tagged skull, scales and lymphatic system.

“Zebrafish are used as a model for typical and atypical human development. It is surprising how much we have in common with zebrafish,” said Dr. Diana Bianchi, director of the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), which generated the image. “NIH research affects our lives every



Bakary Samasa is a former trainee in the Weinstein Lab.

day. My hope is that this postage stamp will help spur conversations and appreciation for the importance of basic science research.”

The image was taken by NICHD’s Daniel Castranova, an aquatic research specialist, with assistance from

former trainee Bakary Samasa. The research was conducted in the section on vertebrate organogenesis, led by principal investigator Dr. Brant Weinstein. The lab is devoted to understanding mechanisms guiding the formation of blood and lymphatic vessels. The

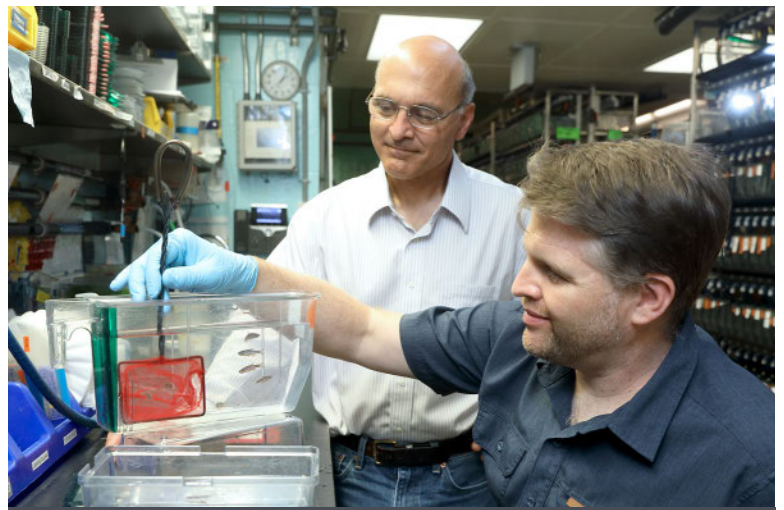
image also received top honors in the 46th annual Nikon Small World Photomicrography Competition in 2020.

Findings from the microscopy image were published in *Circulation Research* and featured on the journal’s cover.

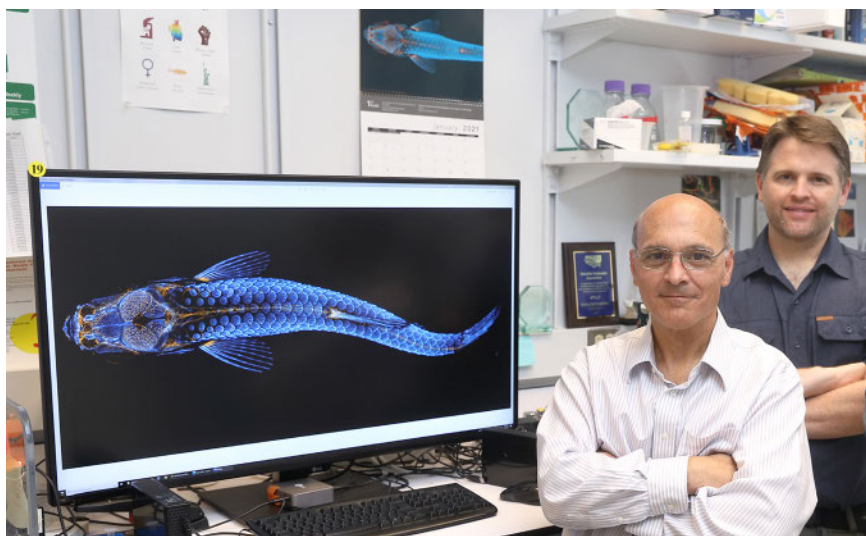
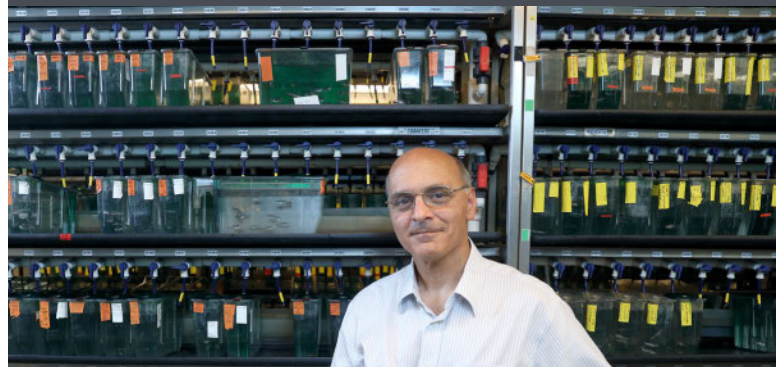
The work led to a groundbreaking discovery that zebrafish have lymphatic vessels inside their skull. These vessels were previously thought to occur only in mammals, and their discovery in fish could expedite and revolutionize research related to treatments for diseases that occur in the human brain, including cancer and Alzheimer’s.

Life Magnified, a set of 20 Forever stamps, also includes work from other researchers relevant to the broader NIH community. Two creators lead microscopy core facilities often used by NIH-funded investigators at their universities. Dr. Tagide deCarvalho,

director of the Keith R. Porter Imaging Facility at the University of Maryland, Baltimore County, created “Moss Leaves” and “Mold Spores.” Jason M. Kirk is director of the Optical Imaging & Vital Microscopy Core at Baylor College of Medicine. He created “Oak Leaf Surface” and “Mouse Brain Neurons.”



Above, Daniel Castranova (r), an aquatic research specialist, scoops up zebrafish for study as Dr. Brant Weinstein looks on. Below, Weinstein leads the section on vertebrate organogenesis in NICHD’s Division of Intramural Research.



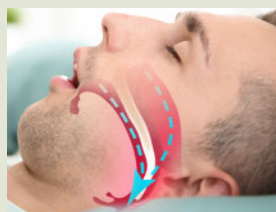
At left, Weinstein (l) and Castranova with their award-winning zebrafish image. At right, Life Magnified, a set of 20 Forever stamps, features the zebrafish and includes work from other researchers relevant to the broader NIH community.





## Study Explains Link to Increased Cardiovascular Risks for People with Obstructive Sleep Apnea

Researchers have found that people with obstructive sleep apnea have an increased cardiovascular risk due to reduced blood oxygen levels, largely explained by interrupted breathing. Obstructive sleep apnea has long been associated with increased risk of cardiovascular issues, including heart attack, stroke and death, but the findings



Airway during obstructive sleep apnea

PIXEL SHOT/SHUTTERSTOCK

from this study, partially supported by NIH and published in the *American Journal of Respiratory and Critical Care Medicine*, show the mechanism mostly responsible for the link.

“These findings will help better characterize high-risk versions of obstructive sleep apnea,” said Dr. Ali Azarbarzin, a study author and director of the Sleep Apnea Health Outcomes Research Group at Brigham and Women’s Hospital and Harvard Medical School. “We think that including a higher-risk version of obstructive sleep apnea in a randomized clinical trial would hopefully show that treating sleep apnea could help prevent future cardiovascular outcomes.”

Researchers reviewed data from more than 4,500 middle-age and older adults who participated in the Osteoporotic Fractures in Men Study and the Multi-Ethnic Study of Atherosclerosis. Investigators sought to identify features of obstructive sleep apnea that could explain why some people were more likely than others to develop cardiovascular disease or related death.

Physiological features of obstructive sleep apnea assessed included hypoxic burden, which is a reduction in blood oxygen levels during sleep; ventilatory burden or interruptions in breathing due to airway obstruction; and nighttime arousals, which are when a person suddenly wakes up from sleep due to interrupted breathing and that can cause their blood pressure or heart rate to rise.

While sleep apnea severity is defined as how many times the airways become blocked during an hour of sleep, this study sought to better characterize underlying mechanisms of obstructive sleep apnea and identify those that strongly predict increased cardiovascular risks.

“Understanding these mechanisms could change the way that sleep apnea clinical trials are designed and what is measured in clinical practice,” said Dr. Marishka Brown, director of the National Center for Sleep Disorders Research at NHLBI.

This study was partially supported by NHLBI, NCATS, NIA and NIAMS.

## Daily Statin Reduces Heart Disease Risk Among Adults with HIV

An NIH-supported study found that statins, a class of cholesterol-lowering medications, may offset the high risk of cardiovascular disease in people living with HIV by more than a third, potentially preventing one in five major cardiovascular events or premature deaths in this population. People living with HIV can have a 50-100% increased risk for cardiovascular disease. The findings are published in the *New England Journal of Medicine*.

“This research suggests that statins may provide an accessible, cost-effective measure to improve the cardiovascular health and quality of life for people living with HIV,” said Dr. Gary Gibbons, director of NHLBI, a study funder. “Additional research can further expand on this effect, while providing a roadmap to rapidly translate research findings into clinical practice.”

For the double-blinded phase 3 trial, known as Randomized Trial to Prevent Vascular Events in HIV (REPRIEVE) study, researchers randomized participants into either a treatment group, where they received a daily statin—in this case pitavastatin calcium—or a control group, where they received a placebo pill that contained no medication. The researchers followed participants for about five years, but ended the trial early when they discovered the treatment benefits outweighed potential risks.

To understand the benefits, the researchers compared how often participants in each group experienced major cardiovascular events, including heart attacks, strokes or surgery to open a blocked artery. They found participants who took daily pitavastatin had 35% fewer major cardiovascular events than those who took a placebo.

“Lowering LDL cholesterol levels reduces risks for cardiovascular events, like having a heart attack and stroke, but these findings suggest there may be additional effects of statin therapy that explain these reduced risks among people living with HIV,” said study chair Dr. Steven Grinspoon, professor of medicine at Harvard University and chief of the metabolism unit at Massachusetts General Hospital. “Ongoing research about how statin therapy may affect inflammation and increased



Statin tablets may offset cardiovascular risk in people living with HIV.

ROGER ASHFORD/SHUTTERSTOCK

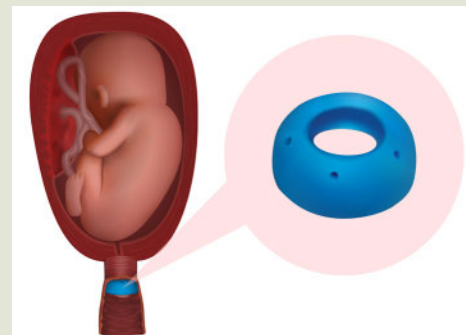
immune activation among people with HIV may help us better understand the additional benefits we’re seeing with this treatment approach.”

## Cervical Pessary No More Effective Than Usual Care in Preventing Preterm Birth Risk

A device known as a pessary, thought promising for reducing preterm birth risk due to a short cervix, appears no more effective than usual medical care, according to a study funded by NIH. A pessary is a rounded silicone device that fits around a cervix that has shortened, to keep it from opening and leading to miscarriage or preterm birth. The device is typically removed before the 37th week of pregnancy.

This multicenter randomized trial was conducted by Dr. Matthew K. Hoffman of the ChristianaCare, Newark, Delaware, and colleagues in the NICHD Maternal-Fetal Medicine Units Network. Findings appear in the *Journal of the American Medical Association*.

Researchers enrolled 544 participants (64% of a planned sample of 850 expectant people from 16 through 24 weeks of pregnancy at risk for preterm delivery because they had a cervical length less than 20 millimeters as measured by ultrasound. At enrollment, attending physicians could perform cervical cerclage (stitching) or administer the steroid progesterone at their discretion.



Study finds cervical pessary no more effective than standard care in preventing preterm birth.

MANIKI\_RUS/SHUTTERSTOCK

Participants were assigned at random to undergo or forego pessary placement or usual care. The researchers designed the study to determine if use of a pessary could reduce the risk of a single primary outcome: delivery or fetal death before 37 weeks.

Study recruitment was stopped early when the researchers could see no real difference between the groups in terms of the overall primary outcome, but the risk of fetal or newborn death appeared unacceptably high in the pessary group.

Authors noted that the usual care group was more likely to receive cerclage, which could have influenced the results.

## RECOVER

CONTINUED FROM PAGE 1

predict and treat long Covid.”

People living with long Covid can experience wide-ranging and debilitating symptoms, he explained. They can have trouble working, sleeping, taking care of their families and doing even basic physical activity among other issues.

“Covid is preventing many from living their normal life and solutions can’t come quickly enough,” he said. “NIH is committed to a highly coordinated and scientifically rigorous approach to find treatments that will provide relief for the millions of people living with long Covid.”

Part of NIH’s Researching Covid to Enhance Recovery (RECOVER) Initiative, the trials were informed by findings from other RECOVER research over the past two years and focus on several of the persistent symptoms described as most burdensome. With its complementary research efforts, RECOVER has positioned NIH to design and conduct trials that have the potential to provide long Covid patients who experience varying symptoms with relief sooner than any individual study can alone.

Treatments in the trials will include drugs, biologics, medical devices and other therapies. The new clinical studies are designed to evaluate multiple treatments simultaneously to identify more swiftly those that are effective.

RECOVER is a large, nationwide research program designed to understand, treat and prevent long Covid, which is marked by long-term symptoms



Dr. Lawrence Tabak (l), Dr. Walter Koroshetz (c) and Dr. Kanecia Zimmerman

helped shape development of the phase 2 clinical trials, which test the safety and effectiveness of treatments typically in groups of 100-300 participants.

following infection by SARS-CoV-2, the virus that causes Covid-19.

The initial stage of the initiative involved launching large, observational, multi-site studies examining and following people through their experience with Covid-19 to learn why some people develop long-term symptoms while others recover completely. These studies are ongoing and have recruited more than 24,000 participants to date.

Researchers also are analyzing 60 million electronic health records and conducting more than 40 pathobiology studies on how Covid-19 affects different body tissues and organs. Data gleaned from these efforts

“The goal is to understand, treat and prevent these post-acute long-term effects,” said Dr. Walter Koroshetz, director of the National Institute of Neurological Disorders and Stroke and RECOVER co-lead. “It’s affected over 100 million Americans. It affects all organs in the body.”

The trials (see sidebar) that launched July 31 will focus on viral persistence and cognitive dysfunction using “platform protocols,” a term used to describe the trials’ adaptive design.

All trials are designed to accelerate identification of safe and effective treatments for some of long Covid’s worst symptoms. Study interventions were reviewed by teams of scientists and patient representatives and approved by NIH leadership based on ideas submitted through a May 2022 request for applications.

RECOVER is committed to enrolling a study population that is inclusive and representative of the communities most affected by long Covid. Study sites will partner with local communities to raise awareness about long Covid and offer opportunities to participate in the trials.

“Our patient and community representatives have provided critical input to help us ensure that the results of these trials are applicable to people across the country and become available as soon as possible,” said Dr. Kanecia Zimmerman, principal investigator of the RECOVER Clinical Trials Data Coordinating Center at Duke Clinical Research Institute.

Trials will continue to launch and enroll participants on a rolling basis. Enrollment will take place at clinical research sites located throughout the United States. A track record for enrolling diverse participants was a key criterion for site selection.

To learn more details, visit <https://trials.recovercovid.org/> 

### Long Covid Clinical Trials Announced July 31

**RECOVER-VITAL** will initially focus on a treatment targeting SARS-CoV-2 persistence, which could occur if the virus stays in the body and causes the immune system to not function properly or organ damage. The first intervention will test a longer dose regimen of the antiviral PAXLOVID (nirmatrelvir and ritonavir) than is used for treating acute Covid to see if it improves the symptoms of patients with long Covid. The first trial sites have been activated and are enrolling.

**RECOVER-NEURO** will examine accessible interventions for cognitive dysfunction related to long Covid, including brain fog, memory problems and difficulty with attention, thinking clearly and problem-solving. Interventions under this protocol will include a web-based brain training program called BrainHQ that has been used to improve cognitive function; PASC-Cognitive Recovery, a web-based goal management training program that has been used to improve executive function; and a device used for home-based transcranial direct current stimulation that has been demonstrated to help brain activity and blood flow.

**RECOVER-SLEEP** will test interventions for changes in sleep patterns or ability to sleep after having Covid-19. A trial for hypersomnia, or excessive daytime sleepiness, will test two wakefulness-promoting drugs compared to a placebo control. A second trial for sleep disturbances, such as problems falling or staying asleep, will test other interventions designed to improve sleep quality to learn if these interventions may help regulate sleep patterns in adults with long Covid.

**RECOVER-AUTONOMIC** will examine interventions to help treat symptoms associated with problems in the autonomic nervous system, which controls a range of bodily functions including heart rate, breathing and digestive system activity. The initial trial will focus on postural orthostatic tachycardia syndrome, a disorder with a number of symptoms including irregular heartbeat, dizziness and fatigue, and will have multiple study arms.

A fifth platform protocol, focusing on **exercise intolerance and fatigue**, is under development with input from the patient community and scientific experts.

## NINDS's Asuzu Awarded Neurosurgeon-Scientist Training Grant

The Society of Neurological Surgeons (SNS) recently awarded a Neurosurgeon-Scientist Training Program grant to Dr. David Asuzu, a neurosurgery resident in the NIH Neurological Surgery Residency Training Program.

The program was launched earlier this year to expand the pool of neurosurgery residents conducting research and to support them in becoming independent neurosurgeon-scientists.

"I am really honored to be included in the inaugural group of this new award program," Asuzu said.

"The selection committee spoke very highly of NIH as a center of excellence both in terms of available research facilities and of faculty mentoring and collaboration among research groups."

Asuzu earned his bachelor of science degree in mechanical engineering from Iowa State University and his master of public health degree from Harvard School of Public Health.

In 2011, he earned his Ph.D. in physiology and biomedical engineering at the Mayo Clinic, and in 2017, his M.D. at Yale School of Medicine. He first came to NIH in 2016 as a visiting medical student and was accepted to the NIH Neurosurgery Residency Program in 2018.

## Feds Feed Families Campaign Underway

Feds Feed Families, the annual federal government summer food drive, is underway. The 2023 virtual campaign is underway through Sept. 30. The NIH community has always contributed generously to this effort to support those in need. Not sure where to donate? There are several organizations local to the District of Columbia, Maryland and Virginia to consider, including the Children's Inn at NIH, the Safra Family Lodge, the Capital Area Food Bank and Manna Food Center. Visit [go.nih.gov/KIXxhjQ](https://go.nih.gov/KIXxhjQ) to learn ways you can donate online to fight hunger. If you have any questions about the campaign, email [FedsFeedFamiliesNIH@nih.gov](mailto:FedsFeedFamiliesNIH@nih.gov).

Asuzu is part of Dr. Prashant Chittiboina's research team in NINDS's neurosurgery unit for pituitary and inheritable diseases. The group focuses on understanding the root cause of Cushing's disease, which is caused when a small tumor in the pituitary gland makes excess ACTH hormone.



Dr. David Asuzu

"Our research uses new molecular biology techniques to probe the genetics and epigenetics of tumor cells causing Cushing's disease, with the hope of discovering new treatments for the disease," Asuzu said.

The NSTP grant will allow Asuzu to supervise an independent research project while still working with Chittiboina. The award also includes formal mentoring from established investigators.

"As a young investigator, this is a tremendous oppor-

tunity. It will provide hands-on leadership training which will be invaluable when I run my own research group in the future," Asuzu said. "In addition, the grant will help me finish ongoing projects and generate preliminary data for future early-stage research grant applications."

SNS is the oldest neurosurgical professional society in the world. The primary goal of the residency training program is to improve human health by providing participants with the skills, mentorship, education and experience needed to successfully compete for individual research funding.—

Shannon E. Garnett 

## EBV Vaccine Trial Needs Volunteers

NIAID researchers are enrolling healthy volunteers ages 18-29 living in the D.C., Maryland and Virginia areas in an investigational Epstein-Barr virus (EBV) vaccine clinical trial. If you are eligible, consider joining to help research to stop the spread of EBV—the most common cause of infectious mononucleosis (mono) and associated with some cancers. Compensation will be provided, up to \$2220 over the course of the trial. For more information, contact the Office of Patient Recruitment at (866) 444-2214 (TTY users dial 711) or [ccopr@nih.gov](mailto:ccopr@nih.gov). Refer to study #21-I-0005. Online: <https://go.usa.gov/xsYK5>.

## Study Seeks Pregnant Women

An NHLBI research study seeks pregnant women between ages 18 and 45 with sickle cell disease who are at risk of having an infant with sickle cell disease to donate their baby's cord blood. Procedures provided at no cost. Contact the Office of Patient Recruitment at (866) 444-2214 (TTY users dial 711) or [ccopr@nih.gov](mailto:ccopr@nih.gov). Refer to study #01-H-0122. Online: <https://go.usa.gov/xSQqW>.

## Cytopenia Study Recruits Participants

The road to recovery after a bone marrow transplant can be complicated by cytopenia(s) (when one or more of your blood cell types is lower than normal). Sometimes this is "immune-mediated," meaning your red cells or platelets are being targeted and destroyed by the body's immune system. NHLBI researchers are testing the drug fostamatinib in adults with immune-mediated cytopenia(s) to see whether it will help. The study enrolls adults who are ≥ 60 days post-transplant, experiencing hard-to-treat cytopenia(s) and are transfusion dependent. If interested, contact the Office of Patient Recruitment at (866) 444-2214 (TTY users dial 711), [ccopr@nih.gov](mailto:ccopr@nih.gov). Ask for study #000758-H. Online: <https://go.nih.gov/ASCoxKs>.



At the farmer's market on campus recently, the Feds Feed Families drive held an info event.

PHOTO: ERIC BOCK



Sujit Hegde on piano performs Barcarolle in F Sharp Major op. 60 by Frederic Chopin



Joanne Fan on flute and Angela Shen on clarinet team up for works by Mozart—Duo no. 2, K. 424, and Andante and Menuetto.



Above, pianist Adishree Strobe performs Nocturne in E-flat Major by Chopin; Below, Khoi Phuong, also on piano, offers Chopin's Nocturne Op. 48 No. 1 and Prelude Op. 28 No. 15



Above, pianist Caroline Su performs Hungarian Rhapsody 6 by Liszt and Sonata No. 26 by Beethoven; at right, cellist Kenji Stokes plays Concerto in A Minor, No. 1, First Movement by Camille Saint-Saens.

## Young Artists of Tacy Foundation Perform at CC

PHOTOS: JANICE DURAN

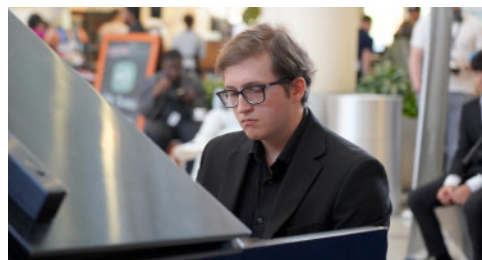
If you were in the atrium of the Clinical Research Center at lunchtime on July 25, you were treated to a Young Artists Noon Concert by musicians of the Tacy Foundation.

According to its website, the nonprofit foundation “empowers children and teens to share hope and joy with hospital patients, military veterans, senior citizens and disadvantaged youth through performances, music recording projects and music mentoring programs.”

Since 2011, when Tacy musicians rendered their first live concert in what the foundation called NIH’s “Hall of Hope,” young people have given performances for patients, staff and visitors at the Clinical Center.

As the event program notes, “The Tacy Foundation dedicates this music to all people who are experiencing challenges in healing from physical and/or emotional illness or injury and who are struggling to heal from the wounds of conflict and loss.”

To read more about Tacy, visit <https://www.tacyfoundation.org/>.



Above, pianist Maximilian Belyantsev gives Cantata BWV 147: Jesu, Joy of Man’s Desiring by J.S. Bach and Rondo in C minor, Wq. 59/4 by C.P.E. Bach; below, trumpeter Issac Won plays Peskin Trumpet Concerto No. 1 Second Movement and Gershwin’s Someone to Watch Over Me.

