# NIH RECORD

September 29, 2023 Vol. LXXV, No. 20

# Valenzuela Creates Test that **Could Detect Exposure of Disease-Causing Insects** BY ERIC BOCK

Diagnostic tests might one day show whether a person was bitten by a sand fly or a tick, and help determine increased risk of the disease



transmitted by these vectors. said Dr. Jesus Valenzuela. "The test uses recombinant salivary

PHOTO: ANGELLODECO/SHUTTERSTOCK

protein of insects to measure insect exposure," said Valenzuela, a senior

# 'ZOOM FATIGUE'

# **Psychologist Discusses Ways** to Recover from Virtual Exhaustion

BY DANA TALESNIK

"Can you see me?" "You're muted." "My internet cut out. Would you repeat that?" The annoyances and flubs that commonly



Dr. Allison Gabriel

meetings seemed less frustrating during the pandemic when virtual platforms such as Zoom were a lifeline to the outside world. Now, in this hybrid world, our tolerance appears to be waning. Why are

occur during virtual

virtual meetings so exhausting? A psychologist recently offered some reasons for the SEE GABRIEL, PAGE 6

investigator in the vector molecular biology section of the National Institute of Allergy and Infectious Diseases (NIAID).

When an insect bites a person, proteins in its saliva interact

with the host's initial

immune response

to help pathogens

evade the host's

These salivary

disease defenses.

proteins also induce

an antibody response

and therefore can be

used for biomarkers.

"We know we



Dr. Jesus Valenzuela

mount antibodies against insect bites or to the components that insects inject when they bite us," he explained. "We just need to identify what salivary proteins we have antibodies to." Valenzuela came up with the idea more than SEE VALENZUELA, PAGE 4

# **GENETICIST IN-TRAINING Cultural Roots Inspire Intern's** Interest in Genetics BY MYRANDA TARR

This summer, college student Hanna Muhammed was challenged to combine



her interests in public health and genetics by joining NIH's Immersive Summer Program for Research in Genomics (iSPRinG). A first-generation rising college junior at the University of Maryland, Muhammed

spent the summer working under seasoned researchers at the National Human Genome Research Institute (NHGRI).

SEE INTERN, PAGE 10

# National Institutes of Health

# WHAT CAME FIRST? **Biochemist Lane Talks Theory** on Origin of Life

BY AMBER SNYDER

According to biochemist, writer and University College London Professor Dr. Nick Lane, "Life is a guide to its own origin."

The idea seems "circular," he admitted, but he proposed that researchers can use



Dr. Nick Lane

qualities that are common to all life on Earth (energy, metabolism and genetic information) to elucidate where it all started.

Lane spoke to a hybrid NIH audience recently in a lecture titled "On the Origin

SEE ORIGIN, PAGE 8



NCATS staffers cook and serve dinner for Children's Inn families. See p. 12.

#### ALSO THIS ISSUE

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#### **Podcast To Highlight Contracting**

On Sept. 15, the Small Business Program Office (SBPO) aired the first episode of a new podcast, *Equity and Inclusion*. The podcast focuses on the nuances of federal contracting and is designed specifically for administrators and faculty at historically Black colleges and universities (HBCUs) and other minority-serving institutions (MSIs). Available for download to a computer or mobile device, the monthly series is published on Spotify (https://rb.gy/azI7q).

Each episode will be hosted by Annette Owens-Scarboro, small business program manager and HBCU coordinator. She will be joined by a co-host from the agency or persons affiliated with the NIH Path to Excellence and Innovation (PEI) Initiative.

HBCUs account for less than 1 percent of the NIH's annual acquisition award funding. PEI was created specifically to cultivate NIH's relationships with HBCUs. The PEI 2.0 cohort concluded in May with 13 HBCUs; the next iteration will be open to additional academic institutions in fiscal year 2024.

The mission of PEI is to empower HBCUs with the knowledge, resources and skills to consistently compete for, and win, contracts from NIH. With the launch of *Equity and Inclusion*, SBPO will expand the reach of the initiative's extensive acquisition training and technical assistance. It's also an opportunity to introduce the potential for a new revenue stream to academic institutions that may not have considered partnering with NIH.

The first episode established the purpose of the podcast and provided an overview of NIH's organizational structure. Episode 1: Who We Are and What We Do is co-hosted by Darnese Wilkerson, director of the Office of Acquisitions. Guests include Diane Frasier, head of contracting activity at NIH, and Pamela Clarke, director of research development at Howard University. Howard has participated in PEI since the inception of the pilot program in 2016. Clarke shares her experiences with NIH and the benefit to Howard University.

Subsequent episodes will air on the 15th of every month. Upcoming Equity and Inclusion episodes for the remainder of 2023 include:

- October: Episode 2: Program Expansion and Technical Assistance
- November: Episode 3: The Value of Business
- Partners and Best Practices for Teaming
- December: Episode 4: Frederick National
- Laboratory's HBCU Engagement

#### CFC 2023 Begins

The 2023 NIH Combined Federal Campaign (CFC) officially started on Sept. 1 and ends on Jan. 15. The National Institute of Nursing Research (NINR) is lead institute this year. A kickoff will be held virtually on Wednesday, Oct. 4 from 11 to 11:30 a.m. at https:// videocast.nih.gov/watch=51178. Learn more about the campaign and how you can support your favorite cause. The kickoff will feature NIH and NINR leader-ship and CFC charities who will share their mission.



At left, OSTP Director Dr. Arati Prabhakar and Chief of Staff Dr. Travis Hyams visited NIH last month. At right, Clinical Center CEO Dr. James Gilman (I) guides the group through the CC.

#### White House Office of Science and Technology Policy Leader Visits NIH

NIH welcomed Dr. Arati Prabhakar, director of the White House Office of Science and Technology Policy (OSTP), to the Bethesda campus on Aug. 3. During her first visit to NIH, she met with institute and center leaders and received a tour of the Clinical Center (CC).

An engineer and applied physicist, Prabhakar served as director of DARPA, the Defense Advanced Research Projects Agency, from 2012 to 2017.

In her first gathering at NIH, she discussed improving patient outcomes with several NIH leaders, including Dr. Lawrence Tabak, acting NIH director; Dr. Tara Schwetz, acting NIH principal deputy director; Dr. Diana Bianchi, director of the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development; Dr. Joshua Gordon, director of the National Institute of Mental Health (NIMH); and Dr. Eliseo Pérez-Stable, director of the National Institute of Minority Health and Health Disparities.

Prabhakar later joined CC CEO Dr. James Gilman, who guided the group to their first lab visit with the National Heart, Lung and Blood Institute (NHLBI). Dr. John Tisdale, NHLBI senior investigator and director of the Cellular and Molecular Therapies Laboratory, shared strategies his team is working on to cure sickle cell disease.

The group also sat down with NIMH distinguished investigator, Dr. Carlos Zarate, chief of the section on the neurobiology and treatment of mood disorders, and chief of the Experimental Therapeutics and Pathophysiology Branch, to discuss how NIMH is developing novel medications for treatment-resistant depression and suicide.

To round out the visits with each lab, Prabhakar met with patients receiving treatment for sickle cell disease and treatment-resistant depression to learn more about the hands-on clinical research NIH is conducting every day.—**Myranda Tarr** 



Dr. Courtney Fitzhugh (I) and Dr. John Tisdale (second from r), senior investigator and director of the Cellular and Molecular Therapies Laboratory, and Dr. Julie Panepinto (r)—all of NHLBI—give guests a tour of an NIH lab.

PHOTOS: CHIA-CHI CHARLIE CHANG

#### **NIH** RECORD

# **Tribal Advisory** Committee Visits NIH for **Annual Meeting**

BY MYRANDA TARR

NIH held its annual Tribal advisory committee (TAC) meeting on the Bethesda campus on Aug. 16 and 17. Tribal leaders from across the country joined NIH leadership and staff to discuss how NIH is working to translate scientific discoveries into clinical advances that help people get and stay healthy.



Participants included (from I) Dr. Alicia Mousseau (Oglala Sioux), Stephen Kutz (Cowlitz Indian), Acting NIH Director Dr. Lawrence Tabak, NIH Tribal Health Research Office Director Dr. Karina Walters (Choctaw Nation), Debra Danforth (Oneida Nation), Herminia Frias (Pascua Yaqui Tribe), Dr. Brittany Jock (Mohawk) and Dr. Donna Galbreath (Ahtna Athabascan)

TAC provides a forum for elected Tribal officials serving on the committee and NIH officials to exchange views, share information and seek advice about NIH policies and priorities. The committee

allows Tribes and American Indian and Alaska Native (AI/ AN) people to have meaningful and timely input in developing NIH programs.

During the two-day meeting, TAC members and NIH staff heard from AI/AN investigators about innovations in community-centered research and in research and training. NIH-funded AI/ AN researchers and research educators discussed research progress and impediments within AI/AN communities, and the forward movement and hurdles in growing the AI/AN field of investigators. TAC members also toured the Clinical Center (CC) and visited two National Heart,

to the Medical Board Room where Dr. Alicia

CC's past, present and future. Aiyelawo answered questions about patient and operational

procedures. NHLBI Chief of Patient Engagement

and Recruitment Julie Erb-Alvarez led the group



NIH recently hosted the annual Tribal advisory committee meeting, which included panels with NIH-funded American Indian and Alaska Native investigators, presentations on NIH research relating to Tribal health, a meeting with NIH leadership and a tour of the Clinical Center. Above, NIMHD Director Dr. Eliseo Pérez-Stable (standing, r) engages participants.

Lung and Blood Institute (NHLBI) labs to learn about NIH's intramural research program and opportunities to participate in clinical research. As many were new to the committee, this was their first visit to NIH.

The group first met CC Chief Operating Officer

Pius Aiyelawo, who provided an overview of the

Mousseau, vice president of the Oglala Sioux Tribe and TAC delegate, led a blessing for the group and NIH.

Dr. Richard Childs, NHLBI clinical director and acting scientific director, explained how his institute is bringing research and clinical work together at



At the meeting table, Frias, Walters and Tabak discuss a wide range of science and health topics. PHOTOS: CHIA-CHI CHARLIE CHANG

the CC. He described some of the first-in-class treatments founded at NIH, such as chemotherapy, HIV/AIDS medications and one of the mRNA Covid-19 vaccines. Childs emphasized how NHLBI and other NIH components "come together as a community to translate science to clinical discourses" through a diverse workforce and patient population.

The group visited Childs's Laboratory on Transplantation Immunotherapy, where they saw T cells and natural killer cells under a microscope and learned how researchers are finding ways to adapt and enhance immune cells to attack cancers.

Tribal leaders also visited Stadtman investigator Dr. Tiffany Powell-Wiley's lab to learn how NHLBI is studying social determinants of obesity and cardiovascular risk to develop appropriate interventions. TAC members were interested in epigenetic markers and how the lab's work is being translated to the policy level, a goal the lab is aiming to achieve with its research.



ON THE COVER: Researchers mapped immune cell "neighborhoods" in the skin of people with psoriasis compared to the healthy skin of people without psoriasis to learn more about the disease course and why it comes with more risk for other health problems. Image won an Award of Merit from the Association of Medical Illustrators Salon.

IMAGE: DONNY BLISS/NIH OCPL

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The NIH Record



National Institutes of Health Turning Discovery Into Health



Conducting research on test kits are (from I) Dr. Lucas Tirloni, Dr. Shaden Kamhawi, Dr. Eva Iniguez and Valenzuela. At right, Valenzuela presents his research during a lecture at the Liverpool School of Tropical Medicine in the United Kingdom.

#### Valenzuela

#### CONTINUED FROM PAGE 1

two decades ago. However, the technology to turn the idea into a reality didn't exist. Advances have brought the concept he envisions closer to fruition. Eventually, he believes these test kits will be available for clinical or home use.

Dr. Shaden Kamhawi and Dr. Eva Iniguez, both members of his lab, recently deployed this technology for elimination campaigns of leishmaniasis in India. Leishmaniasis is a parasitic disease found in parts of the tropics, subtropics and southern Europe. It's caused by infection with Leishmania parasites, which are spread by the bite of sand flies.

There are several forms of leishmaniasis. The most common forms are cutaneous leishmaniasis, which causes skin sores, and visceral leishmaniasis, which affects several internal organs. Left untreated, visceral leishmaniasis is almost

always fatal.

The test identifies where people are being exposed to sand fly bites. Researchers use this data to decide where to deploy insecticides and then test whether they were effective in controlling sand flies and consequently leishmaniasis.

"We take blood from individuals before and after insecticide treatment in the

area and use a recombinant protein from insect saliva to see if antibodies recognize that molecule," Valenzuela said. "This directly measures whether a sand fly has bitten a person."

If fewer people have antibodies against

sand flies, the treatment is effective. This is different than the current procedure they use in the field. Right now, researchers put out traps to collect insects before and after an insecticide treatment. The standard procedure does not measure the contact between the person and the insect.

\* \* \*

# "We want to know more about how many people are exposed to the tick that transmits Lyme disease."

~DR. JESUS VALENZUELA

#### $\star \star \star$

Valenzuela has turned his attention to developing a test to detect the exposure in humans to the tick Ixodes scapulairs, the vector of Borrelia burgdorferi that causes Lyme disease, using the same approach.

> Lyme disease is the most common vector-borne disease in the United States. It's transmitted by the blacklegged tick, also known as the deer tick. Common symptoms include fever, headache, fatigue and a bulls-eye skin rash called erythema migrans. The disease can spread to joints, the heart and the nervous system if left untreated. "We want to know more

about how many people are exposed to the tick that transmits Lyme disease," he said. Right now, they are working on identifying the molecules that most accurately predict whether a person has been bitten by this tick.

His lab and Dr. Lucas Tirloni's lab in

determine where people are most bitten by ticks and initially administer the vaccine candidate to that population.

In the future, the tests could also alert the public to Lyme disease hotspots and the risk of contracting Lyme from a tick bite.

His lab and Tirloni's lab also are working

to develop a test to measure exposure to the brown dog tick Rhipicephalus sanguineous, which transmits Rickettsia rickettsii in Arizona and Northern Mexico. This

and Tirloni's

diagnostic tool will help to

bacteria is responsible for Rocky Mountain Spotted Fever, a potentially fatal disease.

In addition to developing test kits for insect bites, Valenzuela's lab has also produced two potential vaccines against leishmaniasis. It took years of research to identify the right candidate.

"We demonstrated that specific sand fly saliva proteins can induce an immune response that's protective against leishmaniasis," he said.

Valenzuela first came to NIH after he graduated from the University of Arizona with a Ph.D in biochemistry. In 2009, he became a senior investigator in NIAID's Laboratory of Malaria and Vector Research. When he arrived at NIH, there were almost no Latinos. During his time here, he's seen an increase in diversity, something he appreciates.

"The environment here is very supportive," he concluded. "There are a lot of smart people who can answer your questions and you can collaborate with. It's very conducive to great science." B



PHOTO: KPIXMINING/SHUTTERSTOCK



At left, at the fireside chat are (from I) Tony Pearson of Eli Lilly and Co., Dr. Richard Benson of NINDS, Stephanie Monroe of UsAgainstAlzheimer's, NINDS Director Dr. Walter Koroshetz, Dr. Cheryse Sankar of NINDS, Naomi Booker of NINDS and Dr. Pierre Theodore of Roche Genentech. PHOTO: TAM VO/NINDS At center, "Patient Data" panelists Dr. Aliza Fink of the National Organization for Rare Disorders and Christine Von Raesfeld of People with Empathy PHOTO: REBEKAH CORLEW/NINDS At right, the NINDS Nonprofit Forum poster session featured more than 40 in-person and virtual posters. PHOTO: REBEKAH CORLEW/NINDS

# **Forum Focuses on Gene** Therapy, Patient Engagement

**BY SHANNON E. GARNETT** 

Representatives from more than 100 nonprofit organizations across the country recently joined NINDS at its 17th nonprofit forum, "Progress through Partnership."

The day and a half hybrid meeting held at the Natcher Center gave patient advocacy groups an opportunity to share common interests, engage directly with NIH program staff and learn about the National Institute of Neurological Disorders and Stroke (NINDS), NIH and other federal programs.

"The nonprofit forum is a highlight for NINDS every year," said NINDS Director Dr. Walter Koroshetz. "This is the key meeting in which we get to hear from so many different groups and also a chance for the different groups to talk to each other and share lessons learned. We always start out acknowledging the lack of effective therapies for many of the diseases but our institute and the people who work here and the nonprofits are all dedicated to try and change that. We are all involved in the same ecosystem but in different ways, and the goal that binds us all together is to find better treatments for neurological diseases."

Organized in 2005, the forum provides a way for organizations to share experiences and information with each other, and for NINDS to understand how to work with patient advocacy groups effectively to address research needs and challenges.

This year's event welcomed its largest crowd to date with more than 340 participants, including persons with lived experience and caregivers from nonprofit groups, NINDS staff and representatives from industry and other federal agencies.

Rare disease crusader Terry Pirovolakis began with a keynote presentation, "Bespoke Gene Therapy." He introduced the overall theme-gene therapyand shared his experiences in trying to help his son, Michael, who has spastic paraplegia type 50-a rare, slowly progressing neurodegenerative disorder.

The forum also included panel discussions, one-onone meetings with NINDS program staff-in person

and via Zoom-a poster session and networking opportunities.

In "Gene Therapy: Partnerships and Collaborations," panelists discussed the important role of patients and their advocates.

"In an ideal situation we would love to find cures, but that may not always be possible," said panelist Dr. Gopa Raychaudhuri of the Food and Drug Administration (FDA). "There could be therapies that provide significant benefit and what's important is to hear the patient voice in that, right from the very beginning. Patient engagement is critically important and it's critically important from day one as product development plans are being formulated."

During "Ethics in Cell Therapies and Dilemmas Researchers Face," moderated by NINDS Program Director Dr. Jill Morris, panelists from a variety of backgrounds including researchers and patient advocates, shared timely information about the ethics and challenges in gene therapy.

Dr. Penny Dacks of the Association for



Birds-eye view of the poster session in Natcher PHOTO: REBEKAH CORLEW/NINDS

Degeneration led the "Nonprofits Funding Non-Profit Research" session that focused on strategies and resources organizations employ to "move the

"We [nonprofits] have to remember...that we are a very small piece of a large ecosystem for advancing treatments and diagnostics for our conditions," Dacks said.

"Success Stores: Newly

Approved Drugs—The Stages of Approval," a forum favorite, showcased drugs for Rett syndrome, Friedreich's Ataxia and amyotrophic lateral sclerosis or ALS. In addition to the excitement and hope that these drugs bring to the community, the presenters also shared the stages each drug passed through on its journey to approval.

On day two, NINDS Acting Deputy Director Dr. Amy Adams highlighted cross-cutting strategies to increase patient engagement and outlined steps NINDS is taking to partner with people with lived experience.

"I want to emphasize that not only does this feel like the right thing to do, it makes the research better, it makes it move faster," said Adams. "All of a sudden we have treatments for these rare and ultra-rare conditions and that really is the result of the research community partnerships that were developed among the researchers themselves with industry and with government-NIH, FDA and others-and with the nonprofit organizations."

A special session, "Community Engagement Strategies to Boost Diversity Enrollment in Clinical Trials from a Pharma Industry Perspective," moderated by NINDS Program Director Dr. Cheryse Sankar, featured a fireside chat with speakers from pharmaceutical companies discussing their efforts using community engagement to diversify clinical trial participation.

"Big pharma doesn't always have the best reputation and I want to stress the notion that going forward one of our ways of becoming better stewards and better participants in clinical development is to make sure that the voices of the patients are heard in the entire drug development process," said panelist Dr. Pierre Theodore, executive director of Health Equity and Patient Impact at Roche Genentech. "The door is open. We want to hear from you, we want to connect, we want to partner as we continue to try to address health disparities that requires us to be a little bit more nimble in what partnerships look like."

Recordings are available at: go.nih.gov/qeUIXyG and https://go.nih.gov/isfa9Vc.

For more information on the forum, visit https:// go.nih.gov/nu0wUb4. 🖪



At left, Gabriel chats with discussants NICHD Executive Officer Rodney Rivera, NIMH EO Ann Huston and NIH Deputy Director for Management Dr. Alfred Johnson. At right, hundreds of NIH'ers remotely typed in their answers to: "When I think of attending virtual meetings in 2023, my first three emotions are..." Gabriel displayed them in a word cloud.

#### Gabriel

CONTINUED FROM PAGE 1

fatigue and tips for recovery.

"It's not lost on me that I'm talking about Zoom fatigue on a Zoom meeting; I apologize if I'm feeding into the fatigue," said Dr. Allison Gabriel, an organizational psychologist and the Thomas J. Howatt chair in management at Purdue University's Mitchell E. Daniels Jr. School of Business. She spoke at a recent NIH Deputy Director for Management (DDM) seminar.

Gabriel asked attendees to name their first three emotions when thinking of attending virtual meetings now. Seconds later, hundreds of NIH'ers submitted their

responses. The most common included tired, overwhelmed, anxious, dread, frustrated, annoyed, bored and disengaged. Another frequent response: "ugh."

But many replies were positive: normal, relief, happy, safe, appreciative. This dichotomy is seen across the board when Gabriel speaks to different groups. Yes, there's frustration, but many also express gratitude for the convenience of virtual meetings.

Whether people view online meetings favorably or with dread, Zoom fatigue is real. Interestingly, according to Gabriel's research, it has little to do with the number of virtual meetings or the amount of time spent in them on a daily basis. Instead, one of the biggest culprits is being on camera.

"We suspected that being on camera heightened the sense of being watched," she said, and the need to make a good impression, which compels people to constantly check themselves—their hair, mannerisms, the lighting—on camera.

Could hiding self-view be a solution? Possibly. But another challenge is picking up nonverbal cues, such as nodding, that are easier to detect when in the same room. "Being on camera is also really distracting," Gabriel said, making it harder to process those cues online.

To investigate the phenomenon of Zoom fatigue, Gabriel and her colleagues conducted a study in 2020 with a remote organization called BroadPath. Working with 103 people over a four-week period,

> they manipulated and compared camera use and surveyed each person daily about their experience. The researchers considered gender, job tenure and duration and frequency of meetings among the variables.

"We found that being on camera was positively related to feeling fatigued," Gabriel said. And the fatigue hindered participant engagement and the likelihood that they spoke

up during meetings.

"That's pretty shocking because that means the very thing that being on camera is supposed to promote—being engaged and being able to speak up more—is inadvertently getting hurt because people are exhausted from being on camera constantly," she said.

Women reported more fatigue than men.

And recently hired staff were also more fatigued, as they struggled to navigate the dynamics and the jargon.

"This suggests that constant virtual meetings can really upend experiences for certain groups of employees who may be more susceptible to interpersonal challenges," Gabriel said.

Beyond being on camera, Gabriel described several other irritants unique to virtual meetings. One is interpersonal time theft—hogging attention or talking too long without seeking input. Another is disrespect for time—meetings starting late or running over. "This is easy to do with nobody standing to physically leave the room," Gabriel said. Yet another: distracted or zoning-out participants.

Those who are actively participating often struggle with how to break into the conversation, short of interrupting. Of course, there are reaction buttons, such as raising a hand. Gabriel also suggested leaving the chat open and rolling live so participants can enter questions and feedback in real-time, allowing the speaker to integrate responses along the way.

"As leaders," she said, "we underestimate our responsibility to cue people into the conversation versus just being the ones who drive the conversation."

Offering more recovery tips, Gabriel reiterated the responsibility of leaders. "We have a huge impact on people's well-being from the norms we set and encourage."

In the first few minutes of a virtual meeting, she said, small talk can reduce anxiety, create a supportive environment, and help people connect, especially those



Getting out in nature is one way to escape Zoom fatigue. PHOTO: DEBORAH HENKEN/NICHD



Gabriel teleworking with her daughter, born in March 2020 just as the emerging pandemic was sending everyone into lockdown

newcomers. And in those first minutes, leaders should help set expectations for the meeting to reduce ambiguity and help people feel included and engaged.

Give employees their autonomy back, she advised. Limit forced camera use and consider whether a series of emails could replace a scheduled meeting.

On a broader level, she said, leaders should encourage staff to physically and mentally separate from work. "Recovery only works when supervisors support time away from work being truly away from work," she said.

But while working, employees need breaks. When virtual meetings are stacked back-to-back, for example, people lose those micro breaks that they often got in person when walking between meetings or stopping to chat with a colleague. Help people reclaim time by staggering or shortening meetings and building breaks into them. "Let people stretch."

In spare time, people need to psychologically detach. Switch off work-related thoughts. Relax the mind. Exercise. Learn a new skill. Get out in nature.

"When [people] took time after working hours to enact their recovery in this way, they had increased sleep quality...lower emotional exhaustion the next morning and next workday," she said. "They were more engaged, they helped people more and had greater personal initiative. They were really thriving when they came back to work."

Norms keep changing, but virtual meetings are here to stay. That doesn't mean it's any less important to get to know and support colleagues.

"Emotions have a place at work," said Gabriel. "They are cues into how people are feeling about productivity and well-being." If colleagues say they are fatigued or anxious, leaders should ask how to better support them. "There can be real value in creating cultures of authenticity, allowing employees to bring more of their full selves into the workplace, to talk about how they're thinking and feeling, to understand who people are inside and outside of work,"

# Free Flu Shots Offered for Staff

The Office of Research Services and the Clinical Center will provide free flu shots from Oct. 2 through Nov. 9 to staff with a valid NIH identification badge.

Similar to last year, the vaccine will be given by appointment for all sites through an online registration system at https://www.foiltheflu. nih.gov.

#### Prepare for Your Appointment:

Bldg. 10 Location: Parking is limited to Clinical Center occupants only. All individuals must wear

Gabriel said. "I think that's really powerful when it comes to recovery."

Celebrate everything. Whether in-person or virtual, "Take nothing for granted," she said. "Being at work should bring joy, not stress. Remember this when we gather." B

a surgical mask at any flu clinic site and will be provided one upon entering any flu clinic.

Do not arrive for your scheduled appointment time more than 10 minutes early to avoid creating lines at the check-in area.

Wear clothing that allows easy access to the upper arm. Changing areas will not be available.

NIH ordered both high-dose and the regular quadrivalent vaccines for all flu shot sites. Staff ages 65 and older can receive the high-dose vaccine. To learn more about the high-dose flu shot, visit https://www.cdc.gov/flu/prevent/ qa\_fluzone.htm.

m. Changing



# APPOINTMENT REQUIRED NO WALK-INS (UNLESS NOTED ONLINE)

Visit www.foiltheflu.nih.gov to schedule your flu vaccine VPN or Citrix required.

SURGICAL MASK REQUIRED AND PROVIDED AT ENTRANCE

PLEASE DRESS APPROPRIATELY

Wear clothing that will let you quickly expose your upper ar #NIIHfoiltheflu2023 area will not be available.

# <sup>1</sup> BUILDING 10 - MAIN CAMPUS SITE -7<sup>TH</sup> FLOOR ATRIUM

8:00am-3:30pm	
6:00am-7:00pm	
8:00am-3:30pm	
8:00am-3:30pm	
8:00am-3:30pm	
8:00-11:30am; 12:30-3:30pm	
8:00-11:30am; 12:30-3:30pm	

# **OFF CAMPUS SITES**

Oct. 10-13	9am-3pm	<sup>2</sup> Shady Grove
Oct. 23	9-11:30am	<sup>3</sup> Poolesville
Oct. 24-25	9am-3pm	<sup>4</sup> Fishers Lane
Oct.26-27	9am-3pm	<sup>5</sup> BRC
Oct. 27	1pm-3:30pm	<sup>6</sup> Harbor Hospital
Oct. 30-31	9am-3pm	<sup>7</sup> Rockledge



i immunizations are provided to NIH staff

For questions, please contact OMS at 301-496-4411.

All staff with direct patient contact must be vaccinated against influenza

<sup>1</sup> Main Campus, Building 10, Clinical Center: 10 Center Drive, Bethesda, MD 20894, 7<sup>th</sup> Floor Atrium

<sup>2</sup>9609 Medical Center Drive, Rockville, MD 20850, Room 2W910/912

<sup>3</sup>Poolesville: 16701 Elmer School Rd, Dickerson, MD 20842, Building 103 (room will be announced on the clinic day)

<sup>4</sup>Fishers Lane: 5601 Fishers Lane, Rockville, MD 20852, Garden Room 1 (LD20)

<sup>5</sup> BRC - Biomedical Research Center-Bayview: 251 Bayview Boulevard, Baltimore, MD 21224, 3<sup>rd</sup> Floor Atrium Lobby

<sup>6</sup> Harbor Hospital: 3001 S. Hanover St, Baltimore, MD 21225, 5th Floor (room will be announced on the clinic day)

<sup>7</sup> Rockledge: 6700B Rockledge Drive, Bethesda, MD 20817, Suite 1100



At left, Lane explains alkaline hydrothermal vents and their possible role in the origin of life. At right, experiments from Lane's lab used microfluidic chips to mimic the flow of alkaline fluids and ocean water through a permeable barrier, essentially recreating the conditions Lane said gave rise to life.

#### Origin

#### CONTINUED FROM PAGE 1

of Cells and Genes (and Why It Matters to Medicine)," sponsored by the Foundation for Advanced Education in the Sciences (FAES), the Office of Intramural Research (OIR) and Demystifying Medicine series.

"It feels presumptuous to come to NIH and talk about medicine, so I'm going to talk about the origin of life instead," the biochemist joked.

Researchers agree that life likely originated somewhere around 3.8 billion years ago, but the specifics are lost to time.

"I'm vulnerable immediately to a charge of making it all up," Lane acknowledged. "But it's fun to think about."

#### **Traveling Back in Time**

What did our planet look like almost four billion years ago? Picture a "sterile, inorganic, wet, rocky planet," said Lane. And yet, the first single-celled organisms arose in these seemingly inhospitable conditions.

Lane studies bioenergetics, or the way energy flows through living systems. And, at the most basic cellular level, energy is generated by the Krebs cycle. This cycle also produces lipids and the precursors of certain amino acids. Lane and other researchers think this flow of energy may have helped create the first "protocells."

But how could the Krebs cycle generate energy 3.8 billion years ago when there were not yet any organisms in existence?

#### **All About Gradients**

Alkaline hydrothermal vents were essential to this process. The porous minerals that make up these vents are alkaline (or high pH), along with the seawater inside them. In the prehistoric ocean environment, these alkaline vents opened up into acidic (low pH) ocean water outside. In an inorganic environment, a pH gradient can drive reactions between hydrogen and carbon dioxide.

The hydrogen-rich water inside the pores of the vents mixed with the carbon dioxide-rich ocean water. Additionally, the alkaline water inside the vents (about pH 11) also made the hydrogen much more reactive. The vents' pores were also lined with catalytic compounds like iron sulfide, which created a natural proton gradient.

This gradient "effectively drove the reaction between hydrogen and carbon dioxide," Lane explained, "lowering the [energetic] barrier to that reaction happening and driving the reaction to make Krebs cycle intermediaries and then possibly amino acids and some lipids."

Additionally, if lipids were present, then they could have potentially made a bilayer across the openings of each of the pores, making protocells. In these partially closed systems, under the right circumstances, the protocells could form not just amino acids and lipids but also sugars, and ultimately nucleotides.

"It may sound hard to believe, but every step is provable, at least in principle," Lane assured his audience.

#### **Inside the Lab**

The proof he discussed has been researched in numerous labs over the years. Lane's group used microfluidic chips to mimic the flow of alkaline fluids and ocean water through a permeable barrier and observed that it did drive carbon dioxide reduction and build small amounts of organic molecules.

More than 20 years ago, another research group demonstrated that long-chain lipids can form under hydrothermal conditions. Lane's group built on this research, mixing the resulting long-chain fatty acids under



Images from Lane's lecture. At left, the Krebs cycle, the cornerstone of bioenergetics. At right, a graphic depicts the flow of ions between the high-pH alkaline ocean vent and the low-pH ocean water. The vents are lined with catalytic compounds such as iron sulfide (FeS) and nickel sulfide (NiS), which create a proton gradient that drives the reaction between hydrogen and carbon dioxide.

the original hydrothermal vent conditions to see if they could make protocells. And they could: microscopic imaging revealed "robust protocells with bilayer membranes and aqueous interiors," Lane found.

His lab also conducted amino acid synthesis experiments, "recovering the metabolic map as we know it." He theorized that the genetic code is structured by metabolism because the universal core of biochemistry is "older than genes [themselves]."

Bacteria and archaea—the oldest forms of single-celled organisms—both contain the exact same biochemical processes, even though the genes that encode their enzymes and catalyze reactions are not conserved in bacteria and archaea. They have "different genes encoding different proteins catalyzing the same chemistry," Lane elaborated. "The easiest explanation for that is the chemistry came before the genes."

#### Why Does It Matter to Medicine?

About 538 million years ago, oxygen levels in the atmosphere rose significantly and life on Earth diversified in an event known as the Cambrian explosion.

Prior to this, cellular life relied mostly on the reaction of hydrogen and carbon dioxide to make Krebs cycle intermediates, which is actually the reverse of the modern-day Krebs cycle. The oxidative version of this cycle was made possible by the presence of increased oxygen, allowing organisms to harvest energy more easily, grow larger and form more complex food chains.

Human cells use the oxidative Krebs cycle, but damage to some of the structures involved in the cycle can cause a buildup of certain molecules.

"Essentially, the damage alters the flow of molecules in the Krebs cycle and...gives the epigenetic signal to grow," Lane explained, which happens to be "just what cancer cells want." This reductive Krebs cycle does not drive cancer, but creates a more permissive environment. Researchers have noted similarities in other conditions such as diabetes and Alzheimer's.

"I'm not presenting this as right or wrong," he cautioned, "just a way of seeing it that may give you the impulse to think about these questions."

View the archived lecture at https:// go.nih.gov/g95grxn. 🗈



Honorees are (from I) Dr. Walter Bockting, Dr. Madina Agénor and Dr. Cindy Velduis.

### SGM Research Investigator Awards Announced

The NIH Sexual & Gender Minority Research Office presented its annual Sexual & Gender Minority Research Investigator Awards recently. Dr. Walter Bockting received the Distinguished Investigator Award and Dr. Madina Agénor and Dr. Cindy Velduis received Early-Stage Investigator Awards.

The honorees were recognized for exemplary and substantial research contributions to the field of sexual and gender minority health.

Bockting is a clinical psychologist and professor of medical psychology (in psychiatry and nursing) at Columbia University.

Agénor is associate professor in the departments of behavioral and social sciences and epidemiology and Center for Health Promotion and Health Equity at Brown University School of Public Health. She is also adjunct faculty at the Fenway Institute and leads the Sexual Health and Reproductive Experiences (SHARE) Lab at Brown University.

Velduis is an NIH-funded assistant professor in the department of medical social sciences at Northwestern Feinberg School of Medicine and in the Institute for Sexual and Gender Minority Health and Wellbeing at Northwestern University.

For more information about the awards and honorees, visit https://go.nih.gov/EEQLyy9.

#### Pargament To Discuss Spiritual Struggles as a Clinical Research Topic, Oct. 17

Dr. Kenneth Pargament will present "Shaken to the Core: Spiritual Struggles as a Vital Topic for Clinical Research and Practice" on Tuesday, Oct. 17 from 2 to 3 p.m. ET via videocast. Pargament is professor emeritus in the department of psychology at

**Bowling Green** State University. Sponsored by the NIH Religion, Spirituality and Health Scientific Interest Group, the event is free and open to the public. To view the lecture, ao to https:// videocast.nih.gov/. Individuals who need sign language interpretation may send a request to Joan Romaine at



Dr. Kenneth Pargament

RSH-SIG@mail.nih.gov at least five business days before the event.

# VOLUNTEERS

#### **Healthy Volunteers Needed**

Researchers at NIH's Laboratory of Malaria Immunology and Vaccinology are seeking healthy volunteers to be part of a malaria vaccine research study. Malaria is spread to humans after they are bitten by an infected mosquito. Likewise, a mosquito picks up malaria when they bite an infected person. For this study, researchers are developing a new, investigational vaccine with the goal of breaking this cycle. Compensation will be provided. Contact (866) 444-2214 (TTY users dial 711) or ccopr@nih.gov. Refer to study #001501. Online https://go.nih.gov/qHyOvAW.

# MILESTONES

#### Intern CONTINUED FROM PAGE 1

Muhammed's interest in genetics originated upon learning about her Egyptian heritage. She was fascinated by the country's diversity.

"We all speak the same language and are from the same country, but we look so different," said Muhammed.

After digging deeper to learn why that was, she discovered the study of genetics and subsequently NIH.

For her internship, Muhammed worked in NHGRI Senior Investigator Dr. Shawn Burgess's lab studying regeneration in fish. The group targets how zebrafish regenerate hearing. Specifically, Muhammed worked with a postdoc who is targeting ultraconserved DNA sequences, which can provide valuable insights into the genetic basis of various biological processes. Studying these helps scientists understand the mechanisms involved and potentially develop new treatments in the future. From setting up and cleaning tanks to collecting eggs and keeping track of growth, Muhammed was enthusiastic about her work and learning more at NIH.

Muhammed was also looking forward to working down the hall from Dr. Francis Collins, whose work on Hutchinson-Gilford progeria syndrome (HGPS) inspired her to delve into other areas of genetics research. Although she was unable to work in his lab this summer, fate—in the form of a delayed elevator—allowed the two to meet.

"I'm waiting for the elevator, and then this man in my peripheral was standing there," Muhammed recalled. "We're in the elevator and I look at him like, 'that's Dr. Collins, isn't it?""

Of course, it was, and she was excited to speak with him, even for just a brief moment.

Muhammed isn't the only one in her family working at NIH. Her father, Esam Muhammed, works for the NIH Office of Research Services driving patient shuttles, and was the catalyst for Hanna applying to the internship. The elder Muhammed inquired with NIH staff about internship opportunities for his daughter and then strongly encouraged her to apply. He was also a resource for her, providing pointers on key NIH staff she should connect with. Though she sometimes grudgingly started her day much earlier to accommodate her father's schedule, Muhammed ultimately found working at NIH close to him to be a blessing.

"We can go home together and talk about our day," she said.

Like many first-time interns, Muhammed did not know what to expect when coming to NIH. She had a feeling the internship would be harder than the classes she took in her first two years of college, especially since those classes were not directly related to the work she would be doing with NHGRI. But expectations are always scarier than reality,



Muhammed, at a recent poster day for summer students PHOTO: MYRANDA TARR

and she found the internship both manageable and enjoyable.

"I knew it was going to be difficult, but I didn't think it would be impossible if I worked hard," she said.

One key lesson Muhammed learned this summer was time management. In addition to her internship, she also took two summer courses. "I don't think I've taken a break this entire summer," Muhammed lamented, "but that's okay."

She strongly recommends the internship program to other college students who are passionate about health care or science research, and she hopes to return to NIH next year and continue her research on genetics. Muhammed is also practicing for the MCAT and has her sights set on attending medical school upon earning her undergraduate degree in 2025. B



Laura Stephenson Carter PHOTO: GEOFFREY CARTER

# **NIH Catalyst's Carter Retires**

Laura Stephenson Carter has retired as editor-in-chief of the *NIH Catalyst*, a publication about NIH's Intramural Research Program (IRP).

"Laura brought experience in writing and assembling a readable magazine about the intramural program, which when combined with her wonderful sense of humor, attention to detail, and deep knowledge of all things intramural, made her a fantastic editor-in-chief of the *Catalyst*," said Dr. Michael Gottesman, former NIH deputy director for intramural research. "She loves the NIH intramural program, and this showed in everything that she wrote, edited and managed."

Carter began her scientific writing career at Dartmouth-Hitchcock Medical Center after receiving a master's degree in science journalism from New York University. Before that post, she worked at the Federal Reserve Bank of New York and was head of the State Public Affairs Committee for the Junior Leagues of New Jersey.

At Dartmouth, she became associate editor of *Dartmouth Medicine Magazine*, which covers the education, research and patient-care activities of the Geisel School of Medicine at Dartmouth. She came to NIH in February 2009.

"Laura was a one-woman operation who handled all aspects of the *Catalyst*—assigning stories, often writing pieces, editing, [doing] layout in InDesign for print [as well as] layout in Drupal for the web, mailing and [handling the] physical distribution of the print version in bins around the NIH



Takes one to know one—one hotdog catalyst spots another. Carter retired as editor of the *NIH Catalyst*, earlier this year. **PHOTO: GEOFFREY CARTER** 

main campus," said Christopher Wanjek, communications director for the Office of Intramural Research.

One of Carter's most valuable contributions was her foresight and dedication to the *Catalyst's* next generation of authors and editors, noted Wanjek. She helped create a program to mentor NIH trainees interested in science writing.

The *Catalyst* worked with more than 100 trainees. Many have gone on to have meaningful careers in writing and editing positions at places like *Nature*, Johns Hopkins University and NIH. Others used the training to help them prepare for policy positions at NIH and elsewhere.

Carter helped the Intramural Research Program (IRP) wherever needed.

She established intramural liaisons in each institute and center communications office, helped enable the creation of the IRP web portal at irp.nih.gov, nurtured good relationships with her colleagues in communications and "was always on hand to support the Wednesday Afternoon Lecture Series and the NIH Research Festival, from set up to clean up," Wanjek said.

In 2014, she went on a tour of Bldg. 7, an infectious-disease lab facility slated to be torn down. While there, Carter noticed a large, Art Deco-style window depicting a waterfall. The window was going to be destroyed once the building was razed. She couldn't let that happen.

She published the photo along with a note explaining that it was going to be demolished. Former Clinical Center Director Dr. John Gallin read the story and had the window relocated to the hospital. It's now displayed near the Lipsett Amphitheater.

"It's backlit and there's a little history about it on the side, so people know where it came from and who inspired it. I'm proud of that," she said. "I'm also proud that some of our stories alerted researchers to the work of others and led to collaborations."

During the Covid-19 pandemic, the

*Catalyst* began publishing a timeline of

# FEEDING CREATIVE PASSIONS Fogle Caters to Communication by Day, Cuisine by Night

BY MYRANDA TARR

When she's not working with the NIH director's speeches team, VaLorie Fogle is feeding her passion for cooking as a professional chef. For the past 25 years, Fogle—known in the cooking world as "Yaya the Chef"—nurtured her culinary skills and is now a highly regarded chef based in Elkton, Va.

Fogle, executive admin in the NIH Director's Presentations Branch of the Office of Communications and Public Liaison, began her journey to becoming a professional chef at home when she started "catering" her weekly Sunday football gatherings with friends.

At 28 years old, Fogle had already worked as a professional dancer, choreographer and completed a brief stint in the corporate world. She always loved to cook and knew she was good



at it, which led her to pursing a culinary education.

Fogle earned a degree from the esteemed Escoffier Culinary School—one of the toprated culinary

schools in the world and the largest in the country—where she learned the techniques that would trademark her cooking career. pandemic-related events at NIH. "It just seemed like a way to capture what was happening so fast," Carter recounted. "I knew it would be valuable in the long run because it would be a record of what was happening and when."

She is now a special volunteer in the Office of NIH History and Stetten Museum, where she'll explore and write about NIH's many past accomplishments.

"I have been honored to serve in [the *Catalyst*] role for the past 14 years and to have contributed to the NIH mission by keeping everyone informed of advances and services and helping to inspire and to be a catalyst for scientific collaborations," Carter wrote in a farewell note to *Catalyst* readers.

To read an oral history interview with Carter, visit https://go.nih.gov/72ta5kn.

The moniker Yaya the Chef originates from a childhood nickname her grandmother used. "Yaya," a term common in some southern states, means "young artist."

Decades later, the nickname turned out to be a self-fulfilling prophecy. As a chef, dancer, choreographer and painter, Fogle values creativity and



Chef VaLorie Fogle in the kitchen

art. She loves making fusion foods, and her favorite dish to whip up is étouffée—shellfish over rice popular in both Cajun and Creole cuisines.

Though she is her own toughest critic, Fogle finds joy in cooking and sharing her creations with family, friends and her community. Recently, she was named a top 10 finalist in celebrity chef Carla Hall's "Favorite Chef" competition.

Coming up, Fogle is collaborating on two cookbooks set to be released this fall. She will also be featured in a new local news segment called *Retreat Livin' with Yaya the Chef.* She will visit and review wineries along with other hot spots locals should check out.

Though she's balancing a lot on her plate, nothing stops her from pursuing her passions.

"You make it happen," Fogle says. "There's no such thing as limits."

# **NCATS Staffers Serve Dinner at Children's Inn**

The National Center for Advancing Translational Sciences (NCATS) sponsored its second dinner of the year at the Children's Inn at NIH on Sept. 6 and a dozen staff members were at the inn for kitchen patrol.

When the call went out for volunteers, all 12 slots to cook and serve dinner on site to inn families were filled in less than 24 hours.

The menu's theme was "summer cookout" and included hamburgers, hot dogs, veggie burgers, veggie skewers, potato salad, mac and cheese, fruit salad, watermelon, cookies and ice cream.

In addition to the NCATS volunteers who prepared and dished up the meal, staff across the center donated money to help support the dinner.

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.



PHOTOS: ERICA ROSEMOND





NCATS Director Dr. Joni Rutter (fifth from r) made a special appearance to personally thank volunteers. **PHOTO: JONI RUTTER** 

the Children's Inn at NIH

At the inn are (front. from I) Carlos Tristan, Glib Lirazan, Elizabeth Ottinger, Mckenzie Hall, Audie Atienza, Sarah Dunsmore, Gallya Gannot, Erica Rosemond, Emily Davis, Jessica Springer, Kalli Mays (Children's Inn at NIH) and (back row) Steven Pittenger, Kathleen McDaniel.

PHOTO: ERICA ROSEMOND



The summer cookout included hamburgers, hot dogs, veggie burgers, veggie skewers, potato salad, mac and cheese, fruit salad, watermelon, cookies and ice cream.

PHOTO ABOVE: AUDIE ATIENZA; PHOTO BELOW: ERICA ROSEMOND

