

'A MESSY PROCESS' DiClemente Advocates Rethinking the Road to Recovery

BY DANA TALESNIK

It's inevitable. Everyone makes mistakes. A turning point comes when we learn from them. Trying again, perhaps a bit differently this time, could have life-changing effects.

For people in treatment for alcohol use disorder, a relapse—a drink or series of drinks after committing to abstain—can be demoralizing. That's why Dr. Carlo DiClemente, professor emeritus of psychology at the University of Maryland, Baltimore County, wants to dispense with the term



Dr. Carlo DiClemente addresses road to recovery from alcoholism in NIAAA lecture.

“relapse” or at least think differently about how it's characterized.

Relapse is a label that stigmatizes, blames

and contributes to failure, said DiClemente, who currently is director of UMBC's MDQuit Resource Center. He spoke at NIAAA's 11th annual Jack Mendelson Honorary Lecture recently in Masur Auditorium. In many cases, he said, a relapse is a useful, sometimes necessary, event toward sustained change.

Relapse should not be defined by the number of drinks or consequences but should incorporate the person's resolve. “You have to have had at least a period of abstinence or change for you to have a relapse,” said DiClemente.

“Relapse only [happens] when the individual gives up on making the change,” he said. “If someone is still struggling to make a change or take control of their alcohol or stay abstinent, they're not relapsing. They're in the process of struggling to take action and do maintenance activities that would help them get into, and stay in, recovery.”

SEE RECOVERY, PAGE 8

Sufrin Speaks on Reproductive Health Care for Incarcerated Women

The Office of Research on Women's Health recently hosted a webinar on “Reproductive Health Care for Incarcerated Women: Strategies for Promoting Justice Through Research Within an Overlooked Population” as part of its Understudied, Underrepresented, and Underreported (U3) Women Lecture Series. Presenting was Dr. Carolyn Sufrin, a medical anthropologist and



Dr. Carolyn Sufrin

SEE SUFRIN, PAGE 4



Dr. Lawrence Tabak (r), NIH principal deputy director, addresses summer students.

PHOTO: CHRIS KUANG, CODING IT FORWARD

Summer Students Tackle Data Challenges

BY ERIN WALKER

Every summer, hundreds of excited students arrive in Bethesda to engage in a valuable experience working as an NIH student intern or fellow. Students bring a variety of scientific expertise, eager to see what their future may hold and how they can apply their talents to biomedical problems.

SEE SUMMER STUDENTS, PAGE 6



NCATS holds blood drive. See story on p. 12.

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'Adventure in Science' Recruits Faculty for Next Season

After 25 years of holding Saturday morning science classes for children at NIH—often taught by NIH postdocs and other staff—Adventure in Science (AIS) is planning its program for next year.

Because of changed NIH policies regarding minors on campus, AIS currently meets at the Washington Episcopal School, 2 miles south of the NIH campus. But the program itself continues unchanged. AIS aims to show 8- to 11-year-olds the fun of science using hands-on activities—e.g., building (and launching) model rockets, dissect-



AIS students Mary Bish (l) and Penelope Harman (with mothers Rebecca Bish and Kate Beers) work through a challenge in a class on computer coding using Scratch.

PHOTO: HAO DENG

ing frogs, visualizing the activity of enzymes, having children measure their own lung volumes and more.

Teachers at the AIS site have been mostly volunteers from the NIH community and organizers hope that NIH participation will continue even as classes meet off-campus. Volunteering at AIS offers a great opportunity to exercise your teaching skills with an enthusiastic audience. You can volunteer to teach for only one Saturday, or for several.

If you are interested in AIS, think about possible topics you might teach and send your ideas and contact information to Ed Max (emax68@gmail.com). Enrollment for children is completed for this year's program, but if you would like to provide your email address to receive notification next spring about enrollment for 2020-2021, go to adventureinscience.z2systems.com and click on "create account."



Director Entertains at Camp Fantastic

On Aug. 15, NIH director Dr. Francis Collins (r, rear) and his wife Diane Baker (kneeling, r) spent the evening at Camp Fantastic near Front Royal, Va. The camp, which has hosted some 2,000 children with cancer and other life-threatening illnesses since 1983, is held every August for a week in the foothills of the Blue Ridge Mountains. Also in the photo is the camp's medical director for the past 25 years Dr. Stephen Chanock (middle, l); he is director of NCI's Division of Cancer Epidemiology and Genetics. Below, Collins and Baker perform a musical skit at the camp's annual talent show. They sang a slightly modified version of the Carter family classic *Keep on the Sunny Side*, interrupted by knock-knock jokes that drew an enthusiastic response from the kids.

PHOTOS: MARLEEN VAN DEN NESTE



Postbac Finds Underrepresentation in Clinical Trials

BY ERIC BOCK

American Indian and Alaska Natives (AI/AN) make up only about 1 percent of participants in NIH clinical research studies, according to an analysis completed by NINDS's Deionna Vigil.

"The number establishes a comprehensive profile of AI/AN enrollment so we can figure out how to make research accessible to Native communities in the U.S.," said Vigil, a postbaccalaureate researcher at NINDS.

She got the idea to conduct the study 2 years ago when she was a participant in the institute's Summer Internship Program. She learned of the program from friends while at a conference sponsored by the Society for Advancement of Chicanos/Hispanics and Native Americans in Science.

She interned under Dr. Barbara Karp, who



Deionna Vigil

and initiated a project to determine how many AI/AN participants were enrolled in NIH clinical research studies. Once she had an exact number, she could then try to figure out why so few members of this group enroll and what could be done to increase their opportunity to participate.

Vigil asked the Office of Protocol

Services for enrollment information from intramural clinical research studies data covering 2014 and 2017. The results confirmed what she suspected.

"Natives know they are underrepresented. When we read scientific papers, we see other racial groups represented, but where are we?" she said. "Because we're not

...
"Because we're not included in these studies, other people don't know what diseases affect us and at what rate."

-DEIONNA VIGIL

was then chair of the NIH combined neuroscience institutional review board. The IRB provides ethical and regulatory oversight of research that involves human subjects and ensures compliance with regulations, including assuring appropriate representation of minorities in NIH studies.

That summer, Vigil sat in on meetings and reviewed protocols. She noticed that each protocol had a summary featuring demographic information. Typically, she'd find only 1 or 2 AI/AN participants in a study.

"I wasn't sure if that was a theme NIH-wide or if it was just in the protocols our one IRB saw," she explained. "I was interested in looking at why those numbers looked that way and what could be done to address it."

The next summer, she came back to NIH

included in these studies, other people don't know what diseases affect us and at what rate."

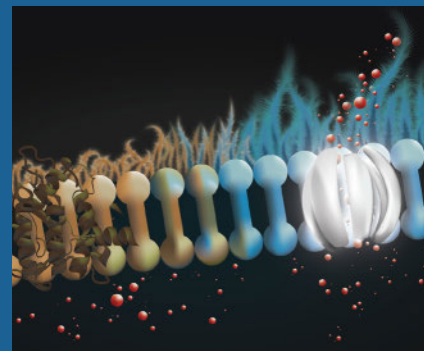
She found that many AI/AN participants enroll in trials on their own initiative, especially studies that are not focused on AI/AN health needs or their communities. One reason for low enrollment in clinical research studies is because physicians who primarily treat AI/AN populations were not aware of study availability, she explained. Right now, there is no way to appropriately make them aware of the studies.

Vigil created a survey for NIH investigators who had enrolled AI/ANs in their protocols and asked whether they were aware of AI/AN enrollment and if they did anything special to enroll them. She also asked about their awareness of biospecimen

and data collection and sharing issues specific to AI/AN populations.

Next, she will use her data to support creation of a liaison between intramural researchers at NIH and tribal nations, as currently exists for extramural investigators. Right now, there are no clear processes on how to identify or handle AI/AN-specific issues that may arise when an individual AI/AN enrolls in an intramural clinical trial.

"The goal is to ensure AI/AN ethical inclusion while making our protocols accessible to them," Vigil concluded. **R**



ON THE COVER: *New approach against cystic fibrosis. In people with cystic fibrosis, a protein that releases a key infection-fighting agent (red spheres) is missing or defective (brown ribbon). Amphotericin (white structure) can form channels to release bicarbonate, restoring the antibiotic properties of the airway surface liquid, which plays a key role in maintaining lung health.*

IMAGE: REBECCA SCHULTZ, CARLE ILLINOIS COLLEGE OF MEDICINE, NIH SUPPORT FROM NHLBI

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Sufrin

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obstetrician-gynecologist specializing in family planning, from Johns Hopkins University.

Sufrin posited that incarceration is a social and structural determinant of health and that mass incarceration in the United States constitutes a public health epidemic. She noted that the U.S. population of 225,000 incarcerated women has a distinct set of health issues that includes higher rates of sexually transmitted infections, mental illness, trauma and substance use problems than the populations of nonincarcerated women and incarcerated men.

The health of incarcerated women has received limited attention in part due to systemic sexism and the pervading assumption “that males are the default prisoners,” said Sufrin.

She said U.S. prisons and jails inconsistently provide family planning services such as contraception, emergency contraception and abortions; menstrual hygiene products; and sex-specific health care.

Sufrin further highlighted that systemic racism also contributes to health care disparities among incarcerated populations, with black men and women representing 14 percent of the general population but 44 percent of the incarcerated population.

Currently, there are no mandatory standards of care for pregnant women in U.S. prisons and jails, and many incarcerated women receive inadequate obstetric care. These facts prompted Sufrin to study pregnancy outcomes in U.S. prisons through funding she received from NIH’s Building Interdisciplinary Research Careers in Women’s Health Program.

Her original research began as the Pregnancy in Prison Statistics (PIPS) project, an epidemiological study collecting pregnancy outcome data from women

incarcerated in participating prisons and jails. The study found that, among the population studied (about 57 percent of U.S. women incarcerated in 2016-2017), 1,396 were pregnant at intake. These pregnancies resulted in 753 live births, 46 miscarriages, 11 abortions, 4 stillbirths, 3 newborn deaths, 2 ectopic pregnancies and no maternal deaths. Pre-term birth rates of incarcerated mothers (6 percent) were lower than those of the overall national rate (about 10 percent) and rates of cesarean delivery were about 30 percent in prisons and jails, which is close to the national average.

The PIPS project has evolved into the Advocacy and Research on Reproductive Wellness of Incarcerated People research group. The project has expanded to “research projects looking at how to provide medication-assisted treatment to women with opioid use disorder in jails and other ongoing

reproductive health studies on pregnancy decision-making and birth control access in places of confinement.”

Sufrin reported that the data on the pregnancy outcomes of

incarcerated women had a high degree of variability from state to state and encouraged researchers studying PIPS data to disaggregate them accordingly. She also described many of the logistical, ethical and safety issues researchers should consider when conducting research on incarcerated populations.

Sufrin also discussed her book *Jailcare: Finding the Safety Net for Women Behind Bars*, which looks at mass incarceration and its intersections with reproductive politics, especially examining the contradictions of providing care in a space of punishment.

A video of Sufrin’s webinar is available at <https://www.youtube.com/watch?v=VKW-jFjFfwDO&feature=youtu.be>. **R**

★ ★ ★
Currently, there are no mandatory standards of care for pregnant women in U.S. prisons and jails, and many incarcerated women receive inadequate obstetric care.
★ ★ ★



Dr. Alison Cernich is NICHD's deputy director.

Cernich Named NICHD Deputy Director

Dr. Alison Cernich was sworn in as NICHD’s deputy director on Sept. 3. Since 2015, she has served as director of NICHD’s National Center for Medical Rehabilitation Research (NCMRR), overseeing a \$72 million research portfolio aimed at improving the health and well-being of people with disabilities. As NCMRR director, she also played a major role in developing the congressionally mandated NIH Rehabilitation Research Plan in 2018, an effort that included coordination with 17 institutes and centers and several external stakeholders.

Cernich is a board-certified clinical neuropsychologist, with expertise in cognitive neuroscience. Prior to joining NICHD, she served as deputy director of the VA’s Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury, where she coordinated prevention, education, research and clinical care efforts for service members and veterans diagnosed with traumatic brain injury.

Over the last 2 years, Cernich has been instrumental in the planning and development of NICHD’s strategic plan. She has also represented NICHD on several large trans-NIH programs, including All of Us and the HEAL (Helping to End Addiction Long-term) Initiative.

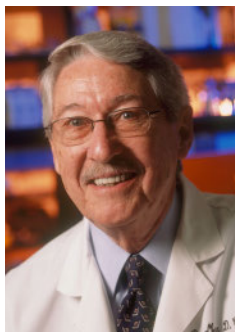
“I am inspired by the mission of NICHD and look forward to advancing it with our team and our community,” she said.

Paul Lecture Kicks Off WALS Season, Oct. 2

The NIH Director's Wednesday Afternoon Lecture Series (WALS) kicks off its 2019-2020 season by hosting the annual William E. Paul Lecture on Wednesday, Oct. 2, in Masur Auditorium, Bldg. 10.

The talk will be presented by Dr. Max Cooper, a professor of pathology and laboratory medicine at Emory University School of Medicine and a Georgia Research Alliance eminent scholar. His talk is titled "Evolution of Adaptive Immunity in Vertebrates."

Cooper's laboratory is studying the evolution of adaptive immunity and exploring the use of lamprey monoclonal antibodies for diagnosis and therapy of infectious diseases and lymphoid malignancies in humans. In the 1960s, he worked with Dr. Robert Good (an American physician who is regarded as the founder of modern immunology) to establish the dual nature of the immune system.



Emory University's Dr. Max Cooper kicks off WALS season.

In addition, Cooper also helped discover antibody class-switching by B cells; describe the lymphoid follicle-associated epithelial M cells in the intestine and their transcytotic function; and define the fetal liver and bone marrow origins of B cells and pre-B cells.

Cooper is a former president of the American Association of Immunologists, the Clinical Immunology Society and the Kunkel Society. He is also a member of the National Academy of Sciences, the Academy of Medicine, the American Academy of Arts and Sciences and a foreign member of the French Academy of Sciences and the Royal Society of London. He has won many awards, including the 2018 Japan Prize.

This annual WALS lecture was established in 2016 in honor of the late Dr. William E. Paul, who was the leader of the NIH immunology community.

There will be a reception, sponsored by FAES, and an opportunity to talk with Cooper in the NIH Library following the lecture. For more information and reasonable accommodation, contact Jacqueline Roberts, (301) 694-6747 or email WALSoffice@od.nih.gov at least 5 days before the lecture.

The WALS season will continue with most lectures being held on Wednesdays at 3 p.m. Check the WALS website (<https://oir.nih.gov/wals>) for details, including location information; Masur Auditorium will be under renovation for part of the lecture season.

NEI HOSTS 'CURIOUS' SCRIBES

Young Science Writers Enjoy NIH Visit

It's possible that some of America's future health leaders briefly appeared on campus this summer. The students were taking part in a program called Curious Science Writers, which offers high schoolers interested in science writing and research a chance to gain firsthand experience.

The course was originally established by the New Jersey Association for Biomedical Research and was operated for several years by States United for Biomedical Research. It's currently being presented by the biomedical research advocacy group Americans for Medical Progress.

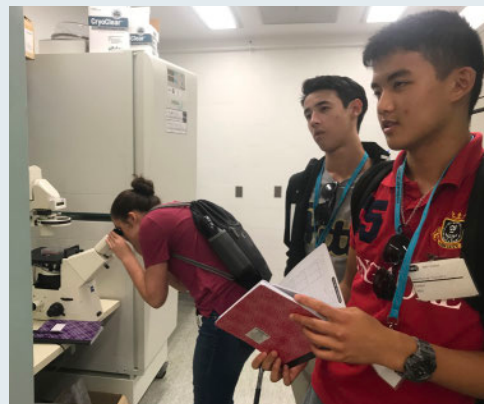
This year's program kicked off with a week-long science writing boot camp, featuring activities, writing exercises, guest lectures and lots of advice for translating complex science concepts so they can be understood and appreciated by the public. One of the highlights of the camp was a visit to the NIH campus, giving students an up-close view of how science works.

The visit was hosted by the National Eye Institute and featured several lectures by NEI scientists investigating various diseases of the eye and also the brain's role in interpreting visual data. Dr. Robert Weichbrod, chief of animal program administration at NEI, took the students on a tour of campus. Stops included the Clinical Center, the Animal Tribute and Reflection Garden and NEI's animal care facilities.

Now that camp is over, student participants are putting what they learned into practice. With the help of science writing mentors, including NIH communications staff, the students are in the process of writing articles that will highlight several current, cutting-edge health investigations. Once completed, the stories will be published on the Curious Science Writers website (<https://curious-sciencewriters.org/>), along with articles written by previous program participants.

Any NIH'ers with students who might be interested in taking part in next summer's program are invited to visit the CSW website for more information. In addition, Curious Science Writers is always looking for volunteers to help mentor future science writers and scientists.

Visit <https://www.amprogress.org/about/contact-us/> to learn more.

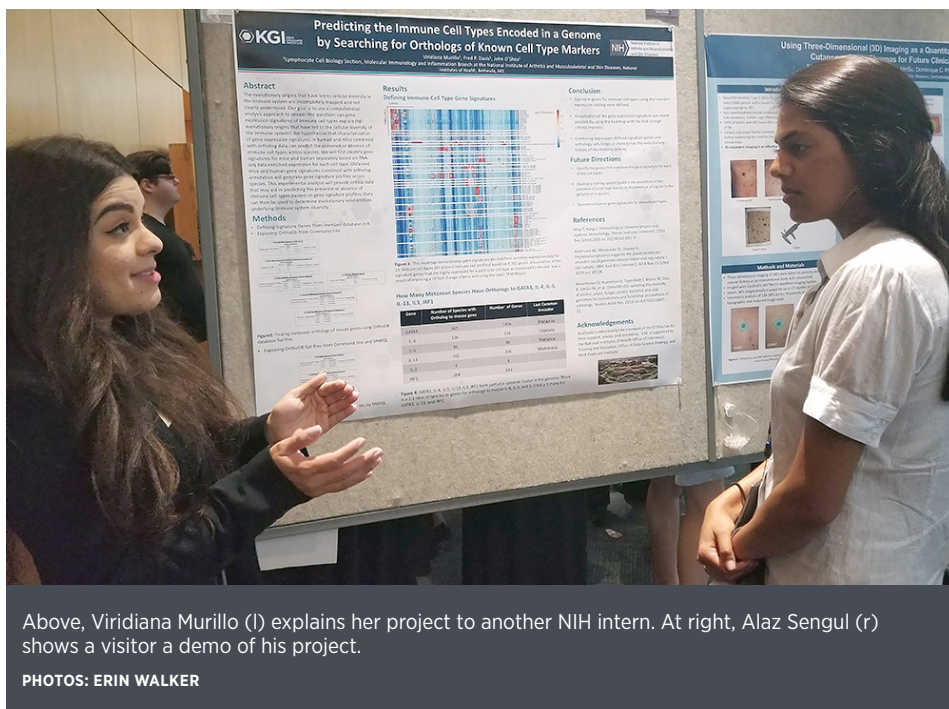


Students tour lab of NIMH's Dr. Jim Pickel.



Youngsters from CSW visit the Animal Tribute and Reflection Garden in the company of NEI's Dr. Robert Weichbrod (c).

PHOTOS: PAULA CLIFFORD



Above, Viridiana Murillo (l) explains her project to another NIH intern. At right, Alaz Sengul (r) shows a visitor a demo of his project.

PHOTOS: ERIN WALKER



Summer Students

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This summer brought a unique group of fellows to campus—21 data-savvy students with computational and technology backgrounds were matched with NIH mentors across 14 institutes, centers and offices. Eight undergraduates and one master’s-level student were brought on as Civic Digital Fellows through Coding it Forward, a non-profit focused on developing the next generation of technology leaders and 12 were master’s-level students brought in through the Office of Intramural Training and Education’s Graduate Data Science Summer Program (GDSSP).

The Office of Data Science Strategy organized the Civic Digital Fellows visit to NIH and worked in partnership with OITE to establish the GDSSP. ODSS also collaborated with offices across NIH to host and support these students.

Civic Digital Fellows were placed primarily in administrative or extramural-facing offices, while GDSSP fellows spent their summers in intramural research labs. The fellows spent 10 weeks at NIH applying their

expertise to hands-on problems such as new challenges in artificial intelligence and data analysis, improving and automating difficult processes and developing new algorithms for classification.

“There are a ton of NIH projects that are using advanced computer science fields to innovate and enhance the health work being done here,” said fellow Alaz Sengul.

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“There are a ton of NIH projects that are using advanced computer science fields to innovate and enhance the health work being done here.”

-ALAZ SENGUL

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“I find it great that tech is being welcomed to this extent at a place where health is the primary focus.”

Sengul is a computer science major at Columbia University and spent the summer working with Drs. Andrew Miklos and Nathan Moore in NIGMS’s Office of Program Planning, Analysis and Evaluation. Sengul used natural language processing to identify, sort and categorize topics in grant applications.

“His contributions greatly aided our program staff in better understanding the

ways in which we can use machine learning tools to characterize our grants portfolio and greatly expanded the capability of our team to reuse the tools he developed over his summer here,” said Miklos, section chief for data collection and analysis in the OPAAE at NIGMS.

“Having Coding it Forward fellows at NIH allows groups to tap into valuable expertise

not normally available within the biomedical research community,” Miklos added.

While the fellows undoubtedly brought tremendous knowledge to their labs and offices, they also had the opportunity to learn first-hand how

data science skills are applied to biomedical research.

Viridiana Murillo, a GDSSP fellow, enjoyed learning how “data science is implemented [to] improve innovation, agility and speed to solve biomedical research questions here at the NIH” while using computational biology to define immune cell type gene signatures from the ImmGen database using the programming language R.

Murillo is a master’s student at the Keck Graduate Institute at the University of Southern California and worked with Drs.

Fred Davis and John O'Shea in NIAMS's Molecular Immunology and Inflammation Branch. She will be returning to NIAMS in the spring to continue working on her project; several other GDSSP fellows have also extended their summer fellowships into capstone projects.

ODSS initiated these fellowships as an activity under the NIH Strategic Plan for Data Science, which provides a roadmap for modernizing the NIH-funded biomedical data science ecosystem and includes a goal of enhancing the data science and computational workforce at NIH.

"Our experiences with these summer students emphasized that having more folks with computational and other tech backgrounds in the NIH and biomedical workforces will add great value," said Dr. Jessica Mazerik, a special assistant to NIH principal deputy director Dr. Lawrence Tabak and workforce advisor to ODSS.

Tabak agrees. After hearing their project presentations, he took a moment at the Civic Digital Fellows' demo day to give them the ultimate compliment.

"None of you can leave," Tabak exclaimed. "You're all hired!" 

Lankford Named Top NIH Lawyer

David Lankford has been selected to be deputy associate general counsel and chief of the NIH branch of HHS's Office of General Counsel, within the Public Health Division. He assumed this position formally on Sept. 15.

Lankford began working in OGC's NIH branch in 1995 and has served as deputy NIH legal advisor since 2013. He has also served as acting NIH branch chief.

He has received the HHS Secretary's Awards for Distinguished Service and for Meritorious Service, OGC's Excellence in Legal Services Award, several NIH Director's Awards and multiple NIH Merit Awards.

Lankford received his A.B. from Columbia University and his J.D. from Georgetown University Law Center. He is admitted to the Maryland Bar.

Showcase Spotlights NCI, FNLCR Inventions

Scientists in the intramural research programs at the National Cancer Institute and the Frederick National Laboratory for Cancer Research (FNLCR) are developing commercially relevant technologies needing development into products to benefit patients.

Developing technologies requires collaboration between federal labs and the business community through a process known as technology transfer. A unique forum, the annual Technology Showcase in Frederick, Md., provides insights into how to license from and collaborate with NCI/FNLCR.

The third annual event was held recently at FNLCR's Advanced Technology Research Facility. The free half-day conference drew more than 200 attendees from companies, entrepreneurs, investors, regional economic development stakeholders and NCI/FNLCR staff.



Drs. Hejiao Bian English (c) and Joseph Conrad (r) from the NCI Technology Transfer Center discuss licensing technologies with an attendee.

Event highlights included:

- NCI and FNLCR principal investigators and inventors presenting technology summaries describing not only "the science," but also the commercial and life-saving potential as well. Additional innovations were highlighted in posters presented by the NCI Technology Transfer Ambassador Program, which is composed of postdocs undergoing training and mentorship in technology development.

- Panel sessions focused on technology commercialization such as "How to Partner with the NCI and FNLCR," "Non-Dilutive

Sources of Funding for Commercializing Technology," "The Role of Incubators and Accelerators" and "Making Your Company Attractive to Equity Investors."

- Attendees learned how to translate discoveries into solutions improving global health, from bench to bedside.

Recent NCI tech transfer success stories include Kite Pharmaceuticals' Yescarta, a cancer immunotherapy transferred out of an NCI lab; Avelumab, commercially known as Bavencio, a pioneering Merkel cell carcinoma treatment developed as part of an agreement between EMD Serono and the NCI TTC; and Gaithersburg-based miReculé, Inc., an early-stage oncology company created around an NCI genetic therapy invention it licensed.



Dr. Thomas Stackhouse (second from l), director, NCI Technology Transfer Center, answers a question during a panel as (from l) TTC's Dr. Michael Salgaller, Dr. Andrew Ishizuka, CSO of Avidea Technologies, and Dr. Vladimir Popov, director of FNLCR's Partnership Development Office, listen in.

PHOTOS: FREDERICK NATIONAL LABORATORY FOR CANCER RESEARCH

"The NCI and FNLCR intramural programs are outstanding sources for technological and scientific innovation of benefit to public health," said Dr. Michael Salgaller of the TTC. "During the afternoon, researchers and business people learned the benefits of working together to create the next generation of medical solutions. They interacted with potential partners and investors, laying the foundation to commercialize future life-changing treatments and cures for cancer patients. The event is one of the ways that NCI TTC works to increase development of NCI intramural inventions so that groundbreaking scientific discoveries make it beyond NCI research labs into products and services of benefit to patients."

Recovery

CONTINUED FROM PAGE 1

Multiple large-scale alcohol treatment studies over five decades confirm a consistent trend: there's a lot of relapse. The studies revealed that only a small percentage of participants completely abstained for an entire year following treatment. Many were still drinkers, and some remained high-risk drinkers. The results have led DiClemente to purport that the notion of relapse contributes to fatalistic attitudes and failure identities.

Such setbacks are not unique to addiction.

"Relapse is actually

probable with any health behavior change, and it's often at the same rates as with addictive behaviors," said DiClemente. From sticking to dietary restrictions to faithfully taking medication for chronic illness, it's tough to avoid slip-ups when trying to sustain behavior change over time.

If a relapse makes people think they've failed, they may abandon their efforts altogether rather than forging ahead to overcome their addiction. Acknowledging that some people need medication during

recovery, DiClemente continues to promote a cognitive/behavioral model, namely one he co-created more than 30 years ago that's still in use today.

This approach, the transtheoretical model (TTM), features five stages of behavior change, each of which identifies critical tasks needed to move to the next stage. "Relapse is a problem of adequately completing one or more of the critical tasks of the stages of change that would enable someone to

achieve sustained change," he said.

The first stage is precontemplation (not interested or ready to consider change). Then the person considers change

in the contemplation stage, by weighing risks and rewards. The preparation stage brings commitment and planning begins. The fourth stage is action, during which the person implements and revises the plan as needed. Finally, in maintenance, the person consolidates the change into a new lifestyle.

The process may seem straightforward, but it's multifaceted. "Just because somebody moves forward and starts thinking about change doesn't mean they're going to stay there" and move to the action stage. "It's

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"Slips and lapses teach us there's something wrong with what I'm doing currently."

—DR. CARLO DICLEMENTE

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a messy process," said DiClemente, noting that there are many ways recovery can be compromised.

In the TTM, relapse is not a stage but rather an event that triggers recycling, or a slipping back to an earlier, pre-action stage. Regression, relapse and recycling to earlier stages happen throughout the journey to recovery, and relapse typically occurs in the action stage.

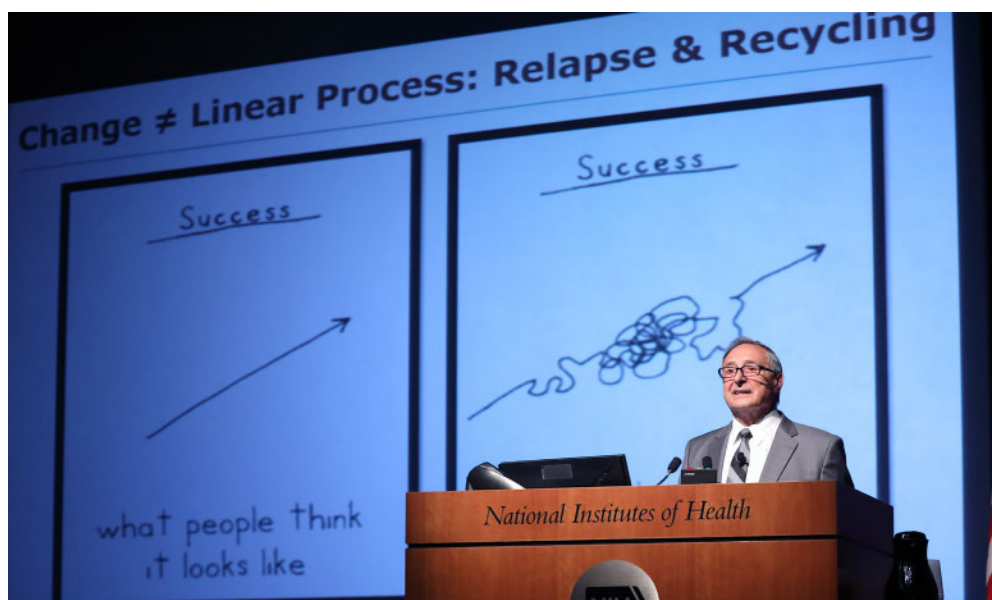
"Slips and lapses teach us there's something wrong with what I'm doing currently," he said. If someone is recycling repeatedly and not revising the plan, it becomes a redo that isn't working; clinicians should assess whether environmental, medical or other factors are impeding progress.

There will always be high-risk situations that make people vulnerable to relapse: cravings, temptations, social cues and stress among them, but they are not completely responsible for relapse. "Recycling helps people learn how to get all the different parts of the process done adequately," said DiClemente.

As the saying goes, where there's a will, there's a way. Some of the best predictors of success in alcohol recovery are coping skills, commitment, sound decision-making and reduced temptation mixed in with a healthy dose of confidence.

Most people who are addicted recycle through multiple quit attempts and interventions, said DiClemente. "You really want to know: where are you now [on the stages continuum], not did you relapse?"

Consider relapse to be a temporary setback and a learning opportunity on the way to getting well, said DiClemente. Consider it recycling on the road to recovery. **R**



There are many ways recovery can be compromised, said DiClemente. "It's a messy process."

PHOTOS: CHIA-CHI CHARLIE CHANG



At left, Dr. Ghada Zamzmi Alzamzmi (l) and Dr. Sameer Antani of NLM are data-science ready. At center, Dr. Stefan Stefanov of NLM shows off his data science passport. At right, Dr. Jimmy Jin of NLM discusses his poster at the NLM open house.

PHOTOS: CHIA-CHI CHARLIE CHANG

HOME OF FIELD'S FUTURE

Passport to Data Science Discovery at NLM

BY KATHRYN MCKAY

One year after kicking off a data science training program, NLM celebrated by hosting a data science open house for its staff on Aug. 27.

During the half-day event with a flight theme, more than 300 employees collected a data science passport that could be stamped by checking out posters, participating in a trivia game, attending talks about data science, sharing suggestions and more.

In her introductory remarks as the NLM data science “pilot,” NLM director Dr. Patricia Flatley Brennan congratulated her staff for being data science frontiersmen and frontierswomen.

“Originally, folks thought about data science as a research tool. Now, we can see it’s part of our everyday activities,” she said. “At the National Library of Medicine, we are the future of data science.”

Aspects of that future were reflected in many of the event’s 77 posters, which included topics such as predicting coronary heart disease with a classification model, using natural language processing to identify chemicals in maternal milk and predictive modeling of drug reviews.

During the trivia game, emcee Dr. Maryam Zaringhalam posed multiple-choice questions on data science to four NLM leaders—Joyce Backus, Dr. Mike Huerta, Dr. Bart Trawick and Brennan.

They did well when asked about who can be a data scientist (everyone), an alternative way to say data wrangling (data munging) and the four Vs of big data (volume, velocity, variety and veracity). But they turned to the audience for help guessing how many times “data science” appears in the NLM strategic plan (62), which AI assistant was ranked the smartest by *Forbes* magazine in 2018 (Google

assistant) and what percentage of the world’s data is currently analyzed (0.5 percent).

In short speeches, Dr. Lisa Federer focused on developing the library workforce for data science; Dr. Rezarta Islamaj shared her research on biomedical literature; and Dr. Don Comeau spoke about his research on indexing for literature retrieval in PubMed.

The last speaker of the day, Dr. Dina Demner-Fushman, discussed what makes a good data science opportunity and how problems can be solved with data. “Do we have the skills?” she asked. “Increasingly, the answer is yes. From what I’ve seen today, we are ready to go forward.”

By the end of the event, more than 60 suggestions for a data science-filled future covered the idea wall. Written on colorful slips of paper, the ideas included using data to enhance existing services, the need for more training, making data fairer and letting the world know that data science is cool. On Aug. 27, there was no doubt that data science is cool.



At left, gearing up for trivia on data science are (from l) NLM director Dr. Patricia Flatley Brennan, Dr. Bart Trawick, Joyce Backus and Dr. Mike Huerta. At right is NLM’s data science idea wall.





A female *Aedes* mosquito, which spreads dengue virus

IMAGE: NIAID

Graphene Shield Shows Promise in Blocking Mosquito Bites

An innovative graphene-based film helps shield people from disease-carrying mosquitos, according to a new study funded by NIEHS. The research, conducted by the Brown University Superfund Research Center, is published in the *Proceedings of the National Academy of Sciences*.

“These findings could lead to new protective methods against mosquitos, without the environmental or human health effects of other chemical-based repellants,” said Dr. Heather Henry, a health scientist administrator with the NIEHS Superfund Research Program.

Researchers found dry graphene film seemed to interfere with mosquitos’ ability to sense skin and sweat because they did not land and try to bite. When investigators looked closely at videos taken of the mosquitos in action, they noticed the insects landed much less frequently on graphene than on bare skin. The graphene film also provided a strong barrier that mosquitos could not bite through, although when wet it did not stop mosquitos from landing on skin.

“We set out imagining that graphene film would act as a mechanical barrier, but after observing the mosquitos’ behavior, we began to suspect they were not interested in biting,” said Dr. Robert Hurt, director of the Superfund Research Program at Brown.

Mosquitos threaten public health by carrying infectious viruses such as Yellow Fever, West Nile and Zika, leading to disability and death for millions of people every year.

Results show that graphene, a tight, honeycomb lattice of carbon, could be an alternative to chemicals now used in mosquito repellants and protective clothing. Until this study, insect-bite protection was an unexplored function of graphene-based materials.

Scientists Develop Potential Strategy Against Leukemia Drug Resistance

Scientists from NIH and Cincinnati Children’s Hospital Medical Center have devised a potential treatment against a common type of leukemia that could have implications for many other types of cancer. The new approach takes aim at a way that cancer cells evade the effects of drugs, a process called adaptive resistance.

The researchers, in a range of studies, identified a cellular pathway that allows a form of acute myeloid leukemia (AML), a deadly blood and bone marrow cancer, to elude the activity of a promising class of drugs. They then engineered a compound that appears to launch a two-pronged attack against the cancer. In several experiments, the compound blocked a mutant protein that causes the AML. At the same time, it halted the cancer cells’ ability to sidestep the compound’s effects. The results, reported Sept. 4 in *Science Translational Medicine*, could lead to the development of new therapies against AML and cancers that act in similar ways.

Co-corresponding authors Dr. Daniel Starczynowski at Cincinnati Children’s, Dr. Craig Thomas at NCATS and their colleagues wanted to better understand drug resistance in a form of AML caused by a mutant protein called FLT3. This form of AML accounts for roughly 25 percent of all newly diagnosed AML cases, and patients often have a poor prognosis. A more thorough understanding of the drug resistance process could help them find ways to improve therapy options.

ER Openings, Closures Impact Resources for Heart Attack Patients

A new study has found that hospital emergency room closures can adversely affect health outcomes for heart attack patients at neighboring



Hospital emergency room closures, and transport distance and time, affect outcomes for heart attack patients, according to a new study.

IMAGE: MONKEYBUSINESSIMAGES/GETTY

hospitals that are near or at full capacity. Conversely, when a new emergency department opens, health outcomes for patients at those so-called “bystander” hospitals improve.

The national study, believed to be the first to evaluate the impact of emergency department openings and closures on bystander emergency departments, looked specifically at outcomes for heart attack patients. But researchers said the findings have implications for all patients, particularly in communities where inadequate health resources contribute to disproportionately poor health outcomes.

The study, funded by NHLBI, was released in the September issue of *Health Affairs*.

“A hospital closure or opening impacts the quality of care that the neighboring hospital can provide to its new patient population,” said Dr. Nicole Redmond, medical officer in NHLBI’s Division of Cardiovascular Sciences. “Hospital closures stress the health care infrastructure, especially if the hospital is already caring for a socially and medically complex patient population and working at full capacity. As a result, such closures may inadvertently increase the health disparities that we are trying to mitigate.”

Scientists used Medicare data between 2001 to 2013 to examine treatment and health outcomes for more than 1 million patients across 3,720 hospitals—including in rural areas—that had been affected by the closure or opening of an emergency department. The authors said they focused on heart attacks because of the known benefits of timely treatment.

The primary measures of health outcomes were 30-day, 90-day and 1-year mortality rates, as well as 30-day readmission rates. Researchers also examined if a patient received an angioplasty and/or stent to open a narrowed or blocked blood vessel that supplies blood to the heart—procedures that can be affected by delayed care or constrained hospital resources.

Researchers found that when the closure of an emergency department was particularly onerous—that is, it resulted in an increased travel time of 30 minutes or more to get to another hospital—health outcomes for patients in the bystander hospitals were negative. The 1-year mortality rate for patients in those hospitals increased by 8 percent and the 30-day readmission rate increased by 6 percent. The likelihood of the same patients receiving the cardiac procedure declined by 4 percent.

On the other hand, researchers found that when an emergency department opened and reduced that driving time by at least 30 minutes, the patients in the bystander hospitals experienced a reduction in 1-year mortality by 5 percent. Researchers also found that the likelihood of these patients receiving the cardiac procedure improved by 12 percent.

Former NLM Director Lindberg Mourned

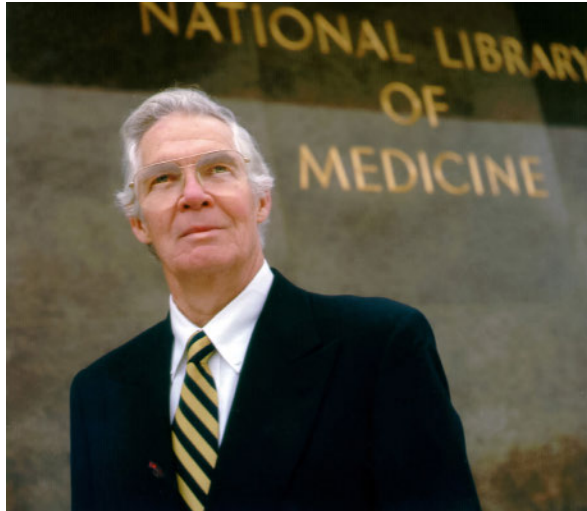
Dr. Donald Lindberg, who served as director of the National Library of Medicine—the world's largest biomedical library—for more than 30 years, died in Bethesda on Aug. 17. He was 85.

A world-renowned leader in applying computers to health care with expertise and outstanding accomplishments relevant to NLM's mission, he was appointed its director in 1984. He was one of the longest-serving leaders at NIH and continued his service as director emeritus of NLM after his retirement in March 2015.

"It is hard to put in words and do justice to the many contributions made by Dr. Lindberg and the many people he touched during his tenure at NLM," said Dr. Patricia Flatley Brennan, who succeeded Lindberg as NLM director. "For so many reasons, I am personally grateful to Dr. Lindberg, not the least of which is his transformation of NLM into a global powerhouse of health information used millions of times a day by scientists, clinicians and patients. His loss is being felt across NLM, NIH and the library science and bioinformatics communities."

In a 2014 statement about Lindberg's planned retirement from the library, NIH director Dr. Francis Collins gave a sweeping view of his contributions:

"Don has created programs that changed fundamentally the way biomedical information is collected, shared and analyzed. Think about it—when Don began, NLM had no electronic journals in its collection, few people owned personal computers and even fewer had access to



Dr. Donald Lindberg served as director of the National Library of Medicine for more than 30 years.

PHOTO: NLM

high-throughput sequencing technologies. GenBank, PubMed Central and dbGaP are just some of the many NCBI databases that support and enable access to the results of research funded by NIH and many other organizations."

Lindberg came to NLM after a distinguished career at the University of Missouri, where he was a pioneer in applying computer technology to health care.

Trained as a pathologist, he reinvented himself to become a leader in the use of computers in medicine. He helped establish the American Medical Informatics Association and became its founding president. He made notable global contributions



"It is hard to put in words and do justice to the many contributions made by Dr. Lindberg and the many people he touched during his tenure at NLM...His loss is being felt across NLM, NIH and the library science and bioinformatics communities."

-NLM DIRECTOR DR. PATRICIA FLATLEY BRENNAN



the Internet. He introduced numerous landmark projects such as free Internet access to MEDLINE via PubMed, MedlinePlus for the general public, the Visible Human Project, ClinicalTrials.gov, the Unified Medical Language System, and more. Don also created the National Center for Biotechnology Information. NCBI has been a focal point for Big Data in biomedicine for decades, providing rapid access to the data generated by the Human Genome Project and now to massive amounts of genetic sequence data generated from evolving

to information and computer science activities for information used in medical diagnosis, artificial intelligence and educational programs.

Born in Brooklyn, Lindberg graduated *magna cum laude* from Amherst College and received his M.D. degree in pathology from the College of Physicians and Surgeons, Columbia University.

Lindberg is survived by his wife Mary, two sons, a brother and two grandchildren. A third son died in 1996.

Young NICHD Scientist Remembered for Passion, Penchant for Helping Others

NICHD mourns the sudden loss of Dr. Philip Gurnev, who had been a staff scientist in the NICHD section on molecular transport since 2015. Gurnev made significant contributions to the field of ion channel biophysics in the lab of Dr. Sergey Bezrukov. Born in 1978, Gurnev received his Ph.D. in physiology in 2003 from the Institute of Cytology of the Russian Academy of Sciences, St. Petersburg. Outside of the lab, Gurnev was known as a loyal friend who could be counted on in a crisis. He is survived by his wife Elena and a newborn son, Eugene. **R**



Dr. Philip Gurnev

VOLUNTEERS

Volunteers with CLL, SLL Needed

NHLBI researchers need volunteers with chronic lymphocytic leukemia (CLL) or small lymphocytic lymphoma (SLL) for a new investigational vaccine study. Researchers are studying how well the Shingrix (shingles) vaccine and HepB (hepatitis B) vaccines work in patients with CLL. If you have CLL that is either untreated or are currently receiving ibrutinib or acalabrutinib, you may be interested in participating. To learn more, call the Office of Patient Recruitment at 1-866-444-2214 (TTY 1-866-411-1010). Read more at <https://go.usa.gov/xmyRE> and <https://go.usa.gov/xmyRy>.

Vaccine Study Seeks Normal Volunteers

NIAID researchers seek healthy volunteers, 18 to 70 years old, to participate in an influenza (flu) vaccine study. Scientists are testing an investigational vaccine to determine if it is safe and if there are any side effects. There is no risk of infection since the investigational vaccine product does not contain any virus. Compensation is provided. For more information, call 1-866-833-5433 or email vaccines@nih.gov.



Musicians Entertain at Clinical Research Center Atrium

PHOTOS: DEBBIE ACCAME

Performing a “Concert with Two Flutes” recently at the Clinical Research Center’s first-floor atrium were Dr. Sarah Frisof (above, r) and Sonia Candelaria. Frisof is a solo artist, an active orchestral musician and educator. She is currently an associate professor of flute at the University of Maryland. Candelaria is a musician with the U.S. Army Ceremonial Band.

Below is Logan Smith, a young

musician who enjoys spreading encouragement through his music. In the vein of icons such as Billy Joel and Elton John, he writes and sings soulful ballads as well as catchy pop songs.

The full National Symphony Orchestra will perform in the CRC atrium on Thursday, Sept. 26 at 1:30 p.m. The program will include works by Vivaldi, Mozart, Copland, Mendelssohn and Ravel, among others. Featured musicians will include Carole Bean on piccolo and Matthew Guilford on bass trombone, with Steven Reineke conducting.



NCATS-Hosted Blood Drive Helps Patients in Need

According to the American Red Cross, someone in the U.S. needs blood every 2 seconds for surgery, cancer treatment, chronic illness or traumatic injury. Keeping up with this relentless demand is extremely challenging, as units of blood are being distributed to hospitals faster than donations are coming in.



NCATS staff participate in local blood drive.

PHOTO: NCATS

NCATS staff helped address the blood-supply emergency in the Washington, D.C., area by partnering with the American Red Cross to hold its own blood drive recently in Rockville. More than 40 NCATS staff and members of the public stepped up during the blood drive to donate blood for patients in need.

The NIH Blood Bank at the Clinical Center also takes donations. You can schedule an appointment or walk in Monday through Friday from 7:30 a.m. to 4:30 p.m.

For more details, see <https://cc.nih.gov/blooddonor>.

NHLBI’s Tisdale Honored at Dinner

Dr. John Tisdale, a senior investigator in NHLBI’s Molecular and Clinical Hematology Branch, recently won the Silver Innovator Award from the Alliance for Aging Research at its recent Congressional Awards dinner. The award is presented to an individual who anticipates and embraces the evolution of high-quality research aligned with the needs of older patients. Tisdale’s research and clinical work center on sickle cell disease. His group focuses on developing curative strategies for sickle cell disease through transplantation of allogeneic or genetically modified autologous bone marrow stem cells.

