



A PUBLICATION OF UCLA HEALTH AND DAVID GEFFEN SCHOOL OF MEDICINE AT UCLA

VICE CHANCELLOR, UCLA HEALTH SCIENCES
CEO, UCLA HEALTH

John C. Mazzotta, MD (RES '81, FEL '83), PhD

PRESIDENT, UCLA HEALTH
CEO, UCLA HOSPITAL SYSTEM

ASSOCIATE VICE CHANCELLOR, UCLA HEALTH SCIENCES

Johnese Spisso, MPA

INTERIM DEAN, DAVID GEFFEN SCHOOL
OF MEDICINE AT UCLA

Steven M. Dubinett, MD (RES '84)

INTERIM CHIEF OF COMMUNICATIONS

Judy Fortin

CHIEF OF MARKETING

Dominic Parero

EDITOR

David Greenwald

NEWS EDITOR

Diya Chacko

ART DIRECTION & DESIGN

Rent Control Creative

CONTRIBUTING WRITERS

Veronique de Turenne
Claire Panosian Dunavan, MD
D'Juan Farmer, PhD
Tom Fields-Meyer
Carla Fried
Dan Gordon
Robin Keats
Julie Kirst
Kenneth Miller
Tammy L. Wallace, CPA

EDITORIAL ADVISORY CO-CHAIRS

Clarence H. Braddock III, MD, MPH
Patrick T. Dowling, MD

EDITORIAL ADVISORY COMMITTEE

Benjamin J. Ansell, MD '92 (RES '95)
Sherin U. Devaskar, MD
Steven M. Dubinett, MD (RES '84)
Dieter R. Enzmann, MD
Brandon Koretz, MD (RES '99, FEL '00)
Bartly J. Mondino, MD
Janet P. Pregler, MD
Thomas B. Strouse, MD (RES '91)
Lindsey Williams

Cover Illustration by
Parko Polo

DEPARTMENTS

02 Leadership

Words of wisdom upon which to build for the future.
By Steven M. Dubinett, MD (RES '84)



PHOTO: GRAD IMAGES

04 Big Picture

The pandemic has taken a toll on health care systems across the state.
By Tammy L. Wallace, CPA

06 Media Watch

COVID-19 has tested more than just the U.S. health care system.
By Carla Fried

08 Science Corner

Putting a microbial workhorse to work to potentially cure illness.
By Kenneth Miller

10 The Cutting Edge

Stem-cell transplant puts HIV-1-positive woman in remission.



IMAGE: SCIENCE SOURCE

18 Conversation:
Dr. Emily Hotez

Sister's life experience drives her career.

22 Spotlight:
Dr. Ranmal A. Samarasinghe
(RES '17, FEL '20)

Observing organoids to understand neurological disorders.

FEATURES



ILLUSTRATION: PARKO POLO

24
Human Touch

The David Geffen School of Medicine at UCLA launches a new humanities curriculum to foster critical thinking and insight into the human condition.

By Claire Panosian Dunavan, MD



ILLUSTRATION: JOHN JAY CABUAY

34
The Psychedelic Rx

It's been a long, strange trip for scientists working to demonstrate the promise of hallucinogens to treat a variety of mental-health issues.

By Dan Gordon

46 Faculty

Dr. Otto O. Yang embraces the power of the pen.
By Veronique de Turenne



PHOTO: JESSICA FOINS

48 Friends

An inventive entrepreneur secures his vision for the future.

56 Epilogue

How a book set a future scientist on his life's path.
By D'Juan Farmer, PhD



PHOTO: SERGIO BIANCO/USC STEM CELL

“Humanities enrich the soul. Medicine is a career that’s very busy and can easily squeeze out anything else. Beyond what little time is left to connect with your family, the role of literature, of film, of theater — you name it — is to encourage renewal and growth, a different part of existence that actually makes the physician more whole and resilient.”

— Dr. Clarence H. Braddock III,
“Human Touch,” p. 24

BREAKTHROUGHS
AND NEWS
FROM UCLA
HEALTH.

Share Your Thoughts With Us
Your input is important, so please give us your comments and feedback. Include your name, email address, city and state of residence and, if you are a UCLA medical alum (MD, PhD, resident and/or fellow), your degree(s) and graduation year(s). Letters and/or comments may be edited for clarity and/or length.

Submit letters to:
editormedicine@mednet.ucla.edu

To read U Magazine online, go to:
uclahealth.org/u-magazine

To subscribe to U Magazine digitally, go to:
uclahealth.org/u-magazine/subscribe



uclahealth.org/getsocial

Spring 2022
Volume 42 • Issue 2

Patients, or the families of patients, quoted and/or photographed or pictured in this publication have given their consent to have their names and/or images used and their stories told.

©Copyright 2022 by The Regents of the University of California. Permission to reprint may be granted by contacting the editor, U Magazine, 10960 Wilshire Blvd., Ste. 1955, Los Angeles, CA 90024. E-mail: dgreenwald@mednet.ucla.edu

Printed on recycled paper

The Painter's Prescription

An artist's words of wisdom form a foundation for building the future of the David Geffen School of Medicine at UCLA.

I SPOKE AT THE WHITE COAT CEREMONY FOR OUR SECOND-YEAR CLASS OF MEDICAL STUDENTS IN FEBRUARY.

The ceremony, which had been postponed due to the COVID-19 pandemic, marks the start of the students' journeys into clinical medicine. As each student received their white coat, the room erupted with cheers of support from their classmates and families. I was deeply moved. I shared with them that this camaraderie and enthusiasm reminded me of a quote from the iconic painter Wayne Thiebaud, who died this past Christmas Day at the age of 101: "It's worth investing in as many deeply involved people as we can muster because I think that's where our hopes lie: in giving us a life of pleasure, challenge, comfort, joyousness — all of the things that make us human and able to relate kindly to each other."

I think Thiebaud is telling us that our community and our relationships with one another are at the heart of everything we do. The students — along with our faculty, staff and trainees — have navigated many challenges and uncertainties

during the past two years of the pandemic. Despite these challenges, our community forged ahead and continued to advance our core missions in clinical care, education, research and community engagement.

Last year we celebrated the 70th anniversary of UCLA's charter class of medical students — 26 men and two women, taught by a faculty of 15 — and we recognize the collaborative accomplishments stemming from those earliest years and now contributing to the transformation of modern medicine. We stand at the threshold of new opportunities in education, research and patient care.

Among our highest priorities is to enhance the requisite infrastructure that reaches across disciplines, departments and UCLA's other schools, breaking down barriers and fully integrating our mission with those of UCLA Health and the broader UCLA campus. To foster even greater collaboration across the spectrum of UCLA's academic disciplines, the David Geffen School of Medicine at UCLA has created seven themes focused on essential

research domains: cancer; cardiovascular research; health equity and translational social science; immunity, inflammation, infection and transplantation; metabolism; neuroscience; and regenerative medicine.

The team-oriented research necessary to achieve breakthroughs in these areas offers significant benefits that include funding, recognition and academic promotion, but even greater reward is within our reach. Effective collaboration unlocks opportunities to translate research into impactful therapies, taking the creative ideas of our scientists from initial concept to clinical breakthroughs for patient care. Both literally and figuratively we are breaking down the walls that divide our research laboratories, allowing us to reach our community.

The value of this approach to research is exemplified by the innovative collaborations that helped us understand the fundamental virology and immunology of SARS-CoV-2, the virus that causes COVID-19, which then led to effective diagnostics and new avenues for therapy. In other studies, school of medicine research teams partnered with the Los Angeles Unified School District to prepare an evidence-based safety plan that allowed students to return to in-person learning during the pandemic. These are two powerful examples of how team science at the David Geffen School of Medicine benefits our communities.

Two more examples further highlight our school's community engagement and leadership. The first is the UCLA-led Community Engagement Alliance (CEAL) Against COVID-19 Disparities, a statewide collaboration among 11 academic community-partnered teams. CEAL provides reliable information about COVID-19 and has helped educate more than 120,000 people through health fairs and town halls. CEAL has trained more than 300 community health workers to share COVID-19 information and counter misinformation about the pandemic and vaccines. The second example is the Get Out the Vaccine Campaign, for which UCLA partnered with the State of California

and 34 community-based organizations across Los Angeles County and the Central Valley to conduct door-to-door canvassing, text messaging and phone calls that have reached more than 7 million individuals. Through this project, more than 75,000 people have registered to receive COVID-19 vaccines, and vulnerable families have been connected to resources that provide rent relief, offer employment assistance and combat food insecurity.

As we face new challenges and build upon the work that has come before, I am honored to have been appointed interim dean of the David Geffen School of Medicine. I came to UCLA in 1988 as a pulmonary and critical-care medicine physician and cancer researcher, drawn by the school's innovative and collaborative environment that fosters advances in research, clinical care and education. This is the magnet that first drew me to UCLA and has held me here for more than 30 years.

Our highest priority is to sustain and enhance our work together. This work draws on the power and efficiencies of effective collaboration as we continue our commitment to developing a diverse workforce and the inclusion of community input. Research into the social determinants of health and health disparities will be highly valued. We are continuing to foster an inclusive science initiative to advance racial and gender equity, diversity and inclusion throughout our enterprise. We will continue our commitment to addressing structural racism by following the anti-racism roadmap. Wayne Thiebaud's wise words describe the cornerstone of our mission: "It's worth investing in as many deeply involved people as we can muster."



Steven M. Dubinett, MD (RES '84), Interim Dean, David Geffen School of Medicine at UCLA



PHOTO: GRAD IMAGES/DAVID GEFFEN SCHOOL OF MEDICINE AT UCLA

Students celebrate following the White Coat Ceremony in February.

The Financial Gut-Punch of the COVID-19 Pandemic

By Tammy L. Wallace, CPA



ILLUSTRATION: BILL ROBLES

SINCE THE PANDEMIC BEGAN IN 2020, we have heard daily reports about the impact COVID-19 has had on patients, their families and frontline health care workers. The human toll of the pandemic has, indeed, been devastating; in May, the COVID-19 ticker officially rolled over on 1 million deaths in the United States.

The pandemic also has taken a significant financial toll on our nation's health care institutions. According to an April 2022 analysis of the financial health of California's hospitals by the respected management-consulting firm Kaufman Hall, 51% operated in the red in 2021, and 55% had unsustainable margins. All told, in the second year of the pandemic financial losses to the state's hospitals totaled nearly \$6 billion. That eye-popping sum is nearly three times previous projections. And while federal support to hospitals offset some of that loss, the remaining losses still came to approximately \$3.7 billion. On top

of that, realized losses in the prior year topped \$8.4 billion — a cumulative uncompensated loss of more than \$12 billion over two years.

That number is just for hospitals in California; in another American Hospital Association-commissioned Kaufman Hall report issued last year, the firm projected that the nation's health care institutions stood to lose upward of \$54 billion in 2021 alone, and the uncertain trajectory of the newly emerging variants "could result in even greater losses."

The challenges are as serious for UCLA Health and its hospitals as they are for many other institutions across the state and nation. The financial losses represent staggering numbers, and their effects may linger for years into the future. The past two years have been marked by unprecedented volatility, and recent months of financial activity have not been as strong as we have historically seen over the past decade. While the approximate \$100 million UCLA Hospital System received in federal CARES Act funding helped, it did not fully mitigate our operating losses.

Yet, UCLA Hospital System is, in some ways, in a better position than many of our peer institutions. While the past two quarters have not been positive,

“In the second year of the pandemic financial losses to the state’s hospitals totaled nearly \$6 billion. That eye-popping sum is nearly three times previous projections.”

the hospital system had a strong first quarter and remains positive on a year-to-date basis. We also took critical steps early in the pandemic to ensure that we would have adequate supplies to address disturbances to the supply chain. In addition, regulatory requirements were implemented by the state mandating that hospitals maintain minimum levels of PPE. Doing so was not without significant cost. Historically, we have operated on a “just-in-time” model — keeping sufficient inventory on hand with daily deliveries to meet our needs, but not stockpiling additional supplies to reduce the risk that medical items fall out of date, or even become obsolete. The pandemic changed that; global shortages and disruptions in distribution necessitated taking a different approach. Anticipating these changes, UCLA Health leased a 35,000-square-foot facility to store essential supplies. Having a warehouse meant the hospital system needed to implement a sophisticated inventory-management system and invest in skilled resources to run it. The price tag to move to this new model has been in the millions.

Going forward, the outlook for all hospitals is further complicated by current fiscal realities that are having an impact on every sector of the national economy. For example, the Federal Reserve Board in May increased interest rates a half-percent — the biggest one-time hike the Fed has made in more than 20 years. National inflation is currently at 8.5%, the highest rate we've seen in 40 years. Gas prices are up 70%. Food prices are up 8.5%. These clearly are signs of unprecedented uncertainty in the economic landscape.

In addition to inflationary increases, we have continuously had to mitigate supply-chain challenges. While we now have plenty of masks, gloves and hand sanitizer — items that all were in short supply in the early stages of the pandemic — we continue to see supply shortages in other necessary medical products.

The Kaufman Hall report highlights additional issues for California's hospitals. According to its findings, supply expenses are up nearly 20%, drug expenses are up 41% and purchased or outsourced services are up 14% from 2019, the year prior to the start of the pandemic. Taken together, total outlays for California's hospitals rose 15% in 2021, outpacing the 11% national

average. For California's hospitals, that meant that margins were, on average, 26% lower than prior to the pandemic.

What to do going forward? One hears the word “resiliency” a lot in the health care industry, and it is something to which we've given a good deal of thought. Undoubtedly, changes will need to be made to improve our financial situation. Such changes often involve growth — for which there are opportunities in the outpatient setting, but where bed limits present challenges in the inpatient setting — and/or curtailing expenses, generally through improving operating efficiencies. While establishing goals for operational improvement has been a routine part of our annual planning, much of that was put on hold during the pandemic to allow leadership to more narrowly focus attention on delivering critical health services. Now, as we come out of what we hope is the worst of the pandemic, we must again think strategically about these issues. But in so doing, we must be mindful of the impact such changes may have on our clinical staff, many of whom have been stretched thin over the course of the pandemic.

The trends are concerning and will need to be addressed as UCLA Health faces significant financial challenges. I anticipate that we will continue to be operating in an environment of fiscal constraint, especially as we continue to see inflationary increases above recent levels. Whatever choices we make in response to these pressures, they will be ones that adhere to our mission of delivering excellent patient care, conducting leading-edge research and educating the next generations of physicians and health care leaders. ●

Tammy L. Wallace is chief financial officer for UCLA Hospital System. Before coming to UCLA Health in 2019, she was vice president of finance for UC San Francisco Medical Center.

COVID-19 TESTED U.S. HEALTH SYSTEMS — AND NEWS HABITS

By Carla Fried

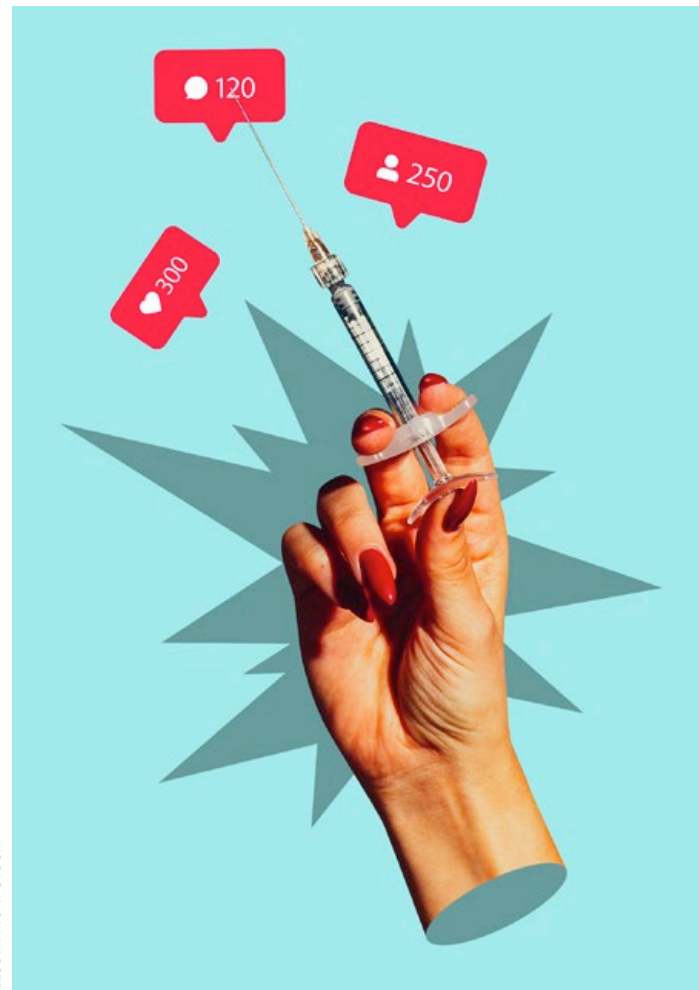


ILLUSTRATION: ISTOCK

of the role social media has played in America's response to the COVID-19 pandemic.

UCLA Anderson School of Management's Jennifer Whitson, Washington University in St. Louis' Benjamin J. Dow, the University of Maryland's Amber L. Johnson, Northwestern's Cynthia S. Wang and Ohio State's Tanya Menon make a case that social media, a very 21st century mode of communication, is central to the story of vaccine hesitancy as it has served as fertile ground for conspiracy theories to gain traction and embolden believers.

Their narrative starts at the very beginning of how the pandemic changed Americans' scripts. Stuck at home during the lockdown, "normal" lives upended, many did what humans do: scrambled to find answers that would provide any sense of order to the chaos. And in lockdown that meant going online.

Nearly six-in-10 people say they often rely on social media for their news.

The authors cite 2021 research that found an uptick in social-media usage as a way to deal with anxieties. People weren't just swapping sourdough bread wins. Nearly half of people surveyed by Gallup reported turning to social media for COVID-19 information in the early stages of lockdown. An analysis of Instagram hashtags published in the *Journal of Medical Internet Research* found that two-thirds of Instagram posts in the first three months of lockdown had COVID-19 hashtags.

And that hasn't abated. A Pew Research report found that nearly six-in-10 people say they often rely on social media for their news. Moreover, the authors note that in a heightened state of worry, many were eager to find new "alternative structures" to make sense of their world. The authors cite three research papers that establish a lack of control increases the likelihood of latching on to a conspiracy theory. "The very same lack of control and, to a lesser extent, uncertainty that drove people onto social media also made them more open to conspiracy theories," they write.

And those individuals flocking to social media for answers stepped into a medium often untethered from the truth. The authors cite two 2020 studies that found, on social-media sites such as Facebook and Reddit, dubious posts pushing conspiracy theories (such as Big Pharma created COVID-19 to generate profits) spread as quickly as reliably sourced posts.

THE LAST TIME THE U.S. FACED A NATIONAL HEALTH CRISIS that could be conquered by vaccination, Americans in 1955 jumped at the chance to get the new Salk polio vaccine, eager to vanquish the debilitating disease that killed thousands each year and left many more permanently disabled. Today, more than a year-and-a-half after free vaccines against COVID-19 became widely available, just over 65% of eligible Americans are fully vaccinated, the omicron and delta variants are killing hundreds of Americans a day and some health care systems are again overwhelmed.

A group of researchers — all have published on the causes and impacts of conspiratorial thinking — corral more than 150 academic studies, surveys and news reports to construct a framework to understand how social media aids and abets the flow of misinformation. In their compilation and contextualization of so much research, the authors bring empirical heft to the debate

"Simply labeling something a 'conspiracy theory' did not make people find it any less believable."

Over on Twitter, the research suggests, viral spread of misinformation was even swifter. A 2018 paper found that false rumors spread six times faster than the truth and bore deeper: The top 1% of false posts reach as many as 100,000 users while the truth rarely gets retweeted or shared to more than 1,000.

Bots are, of course, part of this narrative. The authors note 2020 research that analyzed a sample of more than 43 million English-language tweets about COVID-19. Bots were more focused on political conspiracies, while human tweets were more focused on mundane stuff like public-health concerns.

Then there's the issue of algorithms. The authors cite four studies published in 2020 and 2021 that suggest that, in the process of trying to boost user engagement, the platforms give oxygen to conspiracy theories. And that's a bigger deal than you might think, as the authors slide in that four other studies have found that mere exposure to a conspiracy theory can plant a seed even in the unsuspecting.

Someone spending (more) time on social media, in a frame of mind in which they are more susceptible to conspiracy theories, was then likely to land on posts from influencers beating the COVID-conspiracy drum.

One study found that influencers spreading COVID-19 misinformation generated 20% of the volume of false posts, but those posts accounted for nearly 70% of the engagement (likes, posts, comments, shares, etc.) among their followers.

And the internet in general, and social-media platforms especially, makes it easy to find kindred conspiratorial spirits, which then often leads to living online in an echo chamber impervious to other information. The authors cite a study published in 2021 that found "these online bubbles do not simply reinforce existing beliefs; rather, they tend to encourage the adoption of even more extreme beliefs." Moreover, once one is ensconced in a conspiratorial social-media group, the easy lines of communication help to entrench false beliefs.

A 2020 study provides evidence to support what seems obvious to many: The behavior of people who believe in COVID conspiracies puts them at risk. People who believed that drug companies created COVID-19 for profit motives, or that the Centers for Disease Control and Prevention was unnecessarily scare mongering for political reasons, were less likely to wear a mask or get vaccinated.

As for trying to engage the believers in a fact-based discussion, the review authors take a dispiriting position. They suggest that any pushback serves to entrench the conspiratorial believer, as it "provides both attention and confirmation that the confronted individual is having an impact on the social world around them."

And then there's the further confirmation bias delivered when they can share such encounters with other believers. Being

confronted in the grocery store for not wearing a mask is fodder for a social-media post that prompts other true believers to deliver a virtual high-five.

The authors run through potential strategies for stemming the adoption, spread and effectiveness of conspiracy theories. While there are many possibilities, the practical implementation seems less clear, especially in the near-term.

Banning conspiratorial content is obviously one option. The authors give Facebook credit for banning QAnon and Holocaust-denier conspiracy theories, though those moves were made after much public scrutiny and long after the theories had gone viral. Whether the sites will be more proactive when the next conspiracy theory threatens the public good remains to be seen.

And the authors note that attaching factual pushback to posts containing misinformation may be ineffective. Research published in 2020 found that such messaging didn't penetrate users who were already attached to a conspiracy theory and to a social circle of fellow believers.

While attempts at debunking may be ineffective, the authors suggest other forms of intervention. Multiple studies have shown that when someone is pushed to think critically about the veracity of a conspiracy theory right when they are encountering it, they are less likely to hop on board. The authors reference 2016 research that "simply labeling something a 'conspiracy theory' did not make people find it any less believable." And to be fair, it is unclear how social-media platforms, or any organization, can get between susceptible users and conspiracy theories at the very moment they meet.

The authors suggest that "pre-bunking" might be a better approach. Improving science education and boosting science literacy would be one way to embed critical pushback against anti-vaccination conspiracy theories. That may help stave off today's youngsters from growing into anti-vaxxers. But we've still got a national problem with those who have ventured deep down social media's rabbit hole of COVID-19 conspiracy theories. ●

Carla Fried is a freelance journalist with a keen interest in how behavioral issues affect consumer decisions. Her writing has appeared in The New York Times, Money, Barron's and Consumer Reports. This article originally was published online in UCLA Anderson Review (anderson-review.ucla.edu). It is updated and reprinted with permission.

"The COVID-19 Pandemic and the Search for Structure: Social Media and Conspiracy Theories," *Social and Personality Psychology Compass*, August 2021

WHAT THE YEAST CAN TELL US

By Kenneth Miller



IMAGE: SCIENCE SOURCE

FOR MILLENNIA, THE YEAST SPECIES *Saccharomyces cerevisiae* has been one of humanity's most useful microbial workhorses — transforming flour into bread, grapes into wine and grain into beer, among other tasks. *S. cerevisiae* also serves as a handy tool for biologists: a single-celled fungus, easily grown in the lab, whose metabolic processes can serve as a model for those of more complex creatures. And, UCLA researchers say in a study published last year, this organism's dietary habits may shed light on and potentially lead to new treatments for a genetic disorder that makes dairy products crippling to some people — potentially leading to a host of disabilities that range from intellectual deficits to cataracts — or even deadly.

S. cerevisiae grows best on glucose, a sugar produced by all plants. Although the species can also consume galactose — a breakdown product of lactose, the main sugar in milk — most strains take several hours to activate the genetic pathway that enables them to do so. In recent years, however, scientists have found that some strains, often found in foods like cheese and yogurt, can start processing galactose more rapidly, and grow on it more robustly, than their conventional counterparts. Little is known about the genetic differences that allow dairy-loving strains to metabolize this particular sugar so well.

Unraveling the mysteries of such complex heritable traits is the mission of Leonid Kruglyak, PhD, Diller-von Furstenberg Family Endowed Chair in Human Genetics, Distinguished Professor of Human Genetics and Biological Chemistry and a Howard Hughes Medical Institute investigator. "My lab," he explains, "uses model organisms and computational analyses to understand how changes at the level of DNA are shaped by molecular and evolutionary forces, and how these changes lead to the observable differences among members of a species."

In a previous study, Dr. Kruglyak and his team looked for potential associations between DNA variants and inherited traits in more than 10,000 cultures grown from matings among 16 strains of *S. cerevisiae*. Among the most remarkable results were those involving a soil strain dubbed CBS2888. When this strain was crossed with others, there were striking interactions among three loci (stretches of DNA) known to contain genes crucial to the galactose pathway: some combinations of variants at these loci correlated with much slower than normal growth on galactose.

In the paper published last year, research led by James Boocock, PhD '21, who was a graduate student in Dr. Kruglyak's lab at the time and is now a postdoctoral fellow, pushed these findings further. First, the team sequenced CBS2888's DNA and found that its galactose-related genes were radically different from those of conventional *S. cerevisiae*. "They could have come from another species altogether," Dr. Boocock says. "It was like comparing genes from a human and a mouse."

Next, the researchers used the gene-editing technology CRISPR to engineer strains with every possible combination of the "reference" (conventional) and "alternative" (CBS2888) galactose genes. The strain that grew best on galactose was the one whose genes in all three loci came from CBS2888 — indicating that this soil yeast had somehow evolved to specialize in a sugar typically associated with lactating mammals. The runner-up was the strain whose galactose genes all came from conventional *S. cerevisiae*.

To the researchers' surprise, strains with the mixed-and-matched genes from both sources grew poorly.

Puzzled, the team combed through global collections of sequenced *S. cerevisiae* strains, looking for reference and alternative galactose gene versions — or alleles — outside the lab. Among 1,276 strains, they found two common combinations: only reference alleles (1,213 strains) and only alternative alleles (49 strains). The alternative alleles showed up in dairy products ranging from French Camembert to Chinese fermented yak milk. Missing entirely, however, were strains with mixed alleles, like those the UCLA team had created with CRISPR. If such strains ever existed in nature, they have apparently died out.

Based on this evidence, the researchers theorized that evolution had maintained the different versions of the galactose pathway through "balancing selection" — a process that preserves alternative alleles when each version provides a species with a survival advantage. The best-known example of this phenomenon is the sickle-cell gene, which generates misshapen red blood cells: While individuals who carry two copies of the gene often die young, those with only one copy typically suffer no symptoms, and they are protected from malaria.

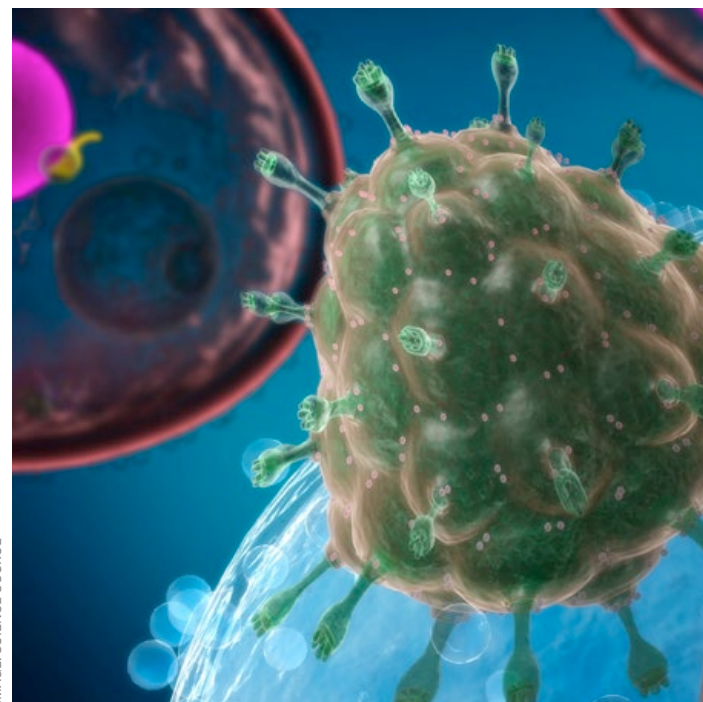
ONE REMAINING QUESTION WAS HOW LONG THE ALTERNATIVE GALACTOSE PATHWAY has existed in *S. cerevisiae*. When the team analyzed the reference and alternative alleles, they found the split occurred approximately 3.2 billion generations ago — or 10-to-20 million years. "That predates the most recent common ancestor of the *Saccharomyces* genus," Dr. Boocock notes. "Ancestral yeasts may have used this pathway to feed on plants with a high galactose content. Or some may have evolved in a cheese-like environment created by mammals suckling their pups."

So what does all this have to do with human health? The incompatible allele combinations the team identified may provide a model for a rare metabolic disease: classical galactosemia. People with this inherited disorder are unable to metabolize galactose; breast milk or dairy-based formula can kill them in infancy. Even if patients avoid dairy products, the body makes small amounts of galactose on its own, often leading to such ills as growth delays, intellectual disabilities, movement disorders, speech problems and early cataracts.

Galactosemia is caused by mutations in the GALT gene, the human equivalent of a yeast galactose gene that Dr. Kruglyak's team is studying. "This disease is reminiscent of the 'sickness' we see in combination strains grown in the lab," Dr. Kruglyak says. "Our research could yield insights into its mechanisms, and hopefully suggest avenues for developing treatments." ●

Kenneth Miller is an award-winning freelance writer and editor specializing in science. His work has appeared in *Discover*, *Mother Jones*, *Esquire* and *Rolling Stone*, among other publications.

Stem-Cell Transplantation for Leukemia Puts HIV-1-Positive Woman in Remission



HIV virus fusing with a host T cell.

UCLA RESEARCHERS PRESENTED THE FIRST CASE OF A U.S. WOMAN LIVING WITH HIV-1 THAT IS IN REMISSION after she received a new combination of specialized stem-cell transplants for treatment of acute myeloid leukemia (AML). This patient has been in remission of AML for four-and-a-half years and had no HIV rebound in the 14 months since antiretroviral therapy was stopped, says Yvonne Bryson, MD, chief of pediatric infectious diseases and protocol chair of the National Institutes of Health International Maternal, Pediatric, Adolescent AIDS Clinical Trials Network, the organization conducting the observational study.

“This study provides hope for the use of cord-blood cells or a combination of cord-blood cells and haploidentical grafts to achieve HIV-1 remission for individuals requiring transplantation for other diseases.”

Dr. Bryson led the study with protocol virologist and scientific committee chair Deborah Persaud, MD, a pediatric-infectious-diseases specialist at Johns Hopkins Medicine. The findings were presented at the Conference on Retroviruses and Opportunistic Infections.

If HIV remission continues and the woman is determined to be cured, she would be only the third person to achieve cure and the first HIV remission to have been successfully engrafted with umbilical-cord blood cells that have a mutation that is protective against HIV-1 combined with stem cells from an adult, haploidentical (“half-matched”) related donor. The two previous patients received adult donor cells — one from bone marrow and one from blood stem cells — that had the protective mutation, but no umbilical-cord blood cells.

The woman was diagnosed with acute HIV in 2013 and high-risk AML in 2017. She was successfully transplanted with cord blood cells having the HIV-protective CCR5-Δ32 mutation and with adult stem cells from a related donor. She did not experience graft-versus-host disease, as the two earlier patients did. She remains clinically well, with no detectable evidence of HIV infection, the researchers say.

Although stem-cell transplantation is not a

therapy for HIV, its effects in patients living with HIV and undergoing therapy for blood or lymph cancers provide researchers with insights and potential targets in HIV treatment. “This study provides hope for the use of cord-blood cells or a combination of cord-blood cells and haploidentical grafts to achieve HIV-1 remission for individuals requiring transplantation for other diseases,” Dr. Bryson says.

The CCR5-Δ32 mutation is rare, but cord-blood banks may provide a previously untapped resource, the researchers say. The combination therapy would enable clinicians to take advantage of the unique benefits offered by each type of graft for more diverse populations. “Adult donor grafts provide many cells initially and rapid engraftment, but histocompatibility can be an issue leading to risk of graft-versus-host disease. Umbilical-cord blood grafts have a lower cell dose and take longer to engraft, but they can be banked for ready availability, and they pose less risk for GVHD,” Dr. Bryson says. “With the combination, the adult graft provides accelerated engraftment until the cord graft takes over.” — **Sandy Van**

“IMPACT P1107: Effects of Cord Blood Transplantation with CCR5Δ32 Donor Cells on HIV Persistence,” ClinicalTrials.gov, updated February 4, 2022

Study Spotlights Gaps in Access to Health Care Among State’s LGBT Community

LESBIAN, GAY, BISEXUAL AND TRANSGENDER ADULTS in California face significant barriers in accessing health care, despite having similar or better rates of health-insurance coverage than heterosexual or cisgender adults, a new UCLA report shows. These barriers include a lack of timely access to needed care, not having a usual source of care, having trouble finding providers and experiencing unfair treatment, according to researchers from UCLA’s Center for Health Policy Research and the Williams Institute in the UCLA School of Law.

Using data from the center’s California Health Interview Survey from 2015 to 2020, the researchers tracked health care access and insurance coverage by sexual orientation and gender identity. They found that bisexual men and women were the most likely of all groups to report not having a usual source of health care (27% and 24%, respectively), and that rates of delaying or not getting needed medical care were considerably higher among bisexual women (33%) and lesbian women (23%) than among straight women (16%).

The study also found that transgender adults experienced greater barriers to care than cisgender adults — those whose gender identity matches the sex they were assigned at birth — in a number of areas. Rates of delaying or

not getting needed medical care, for example, were more than twice as high among transgender adults (33%) as among cisgender adults (14%).

“These findings emphasize the importance of looking more closely at differences within LGBT populations so that actions may be taken to close gaps in health care access and improve health outcomes for sexual and gender minorities,” says Susan Babey, PhD, codirector of the center’s chronic-disease program and an associate researcher in the UCLA Fielding School of Public Health.

Bisexual women (20%) were twice as likely as straight women (11%) to report having trouble finding a medical specialist. Bisexual men (22%) and gay men (18%) had higher rates than straight men (12%) of delaying or not getting needed medical care. Transgender adults (37%) were more likely than cisgender adults (21%) to have Medi-Cal or other public insurance. They also were more likely than cisgender adults to report not having a preventive-care visit in the past year (39% vs. 28%) and to having trouble finding a specialist (29% vs. 11%).

Among transgender adults, transportation problems and insurance not being accepted or not covering care were cited as the main reasons for delaying or not getting needed care,



ILLUSTRATION: MAJA MODEN

“These findings emphasize the importance of looking more closely at differences within LGBT populations so that actions may be taken to close gaps in health care access and improve health outcomes for sexual and gender minorities.”

the researchers say.

Members of the LGBT community were also more likely to experience unfair treatment when getting medical care, with higher rates of lesbian women (44%),

bisexual women (45%) and gay men (32%) reporting such experiences than straight women (32%) and men (23%). Previous negative experiences or discrimination may add to some of the barriers reported by LGBT adults, the study authors note.

“The report provides further evidence that barriers remain to receiving gender-affirming care, and continued advocacy and support is needed to increase access,” says Jody Herman, PhD, Reid Rasmussen Senior Scholar of Public Policy at the Williams Institute. — **Elaiza Torralba**

“Gaps in Health Care Access and Health Insurance Among LGBT Populations in California,” UCLA Center for Health Policy Brief, February 2022

A UCLA STUDY HAS SHED NEW LIGHT ON THE PROCESS by which an RNA molecule known as Xist plays a role in X chromosome inactivation during embryonic development. In mammalian development, every cell in the early female embryo shuts down one of its two copies of the X chromosome while leaving the other functional. For years, the mechanics behind this inactivation have been murky, but scientists from the Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research at UCLA have taken a major step forward in understanding the process.

Their findings, based on research on mouse stem cells, upend previous assumptions about how X inactivation is initiated in female embryos and could lead to new ways to treat some genetic disorders. “X inactivation is one of the most fundamentally important processes in development, and I think this study is a slam dunk in finally understanding it,” says Kathrin Plath, PhD, professor of biological chemistry.

Scientists have known for nearly three decades that, early in embryonic development, an RNA molecule known as Xist is required for X chromosome inactivation in order to prevent female cells from receiving a double dose of X-related proteins. In the absence of clear evidence, most in the field have assumed that many copies of Xist coat the targeted X chromosome or constantly move around between locations on the X to induce the silencing of more than 1,000 genes.

In the new study, Dr. Plath and her colleagues tagged

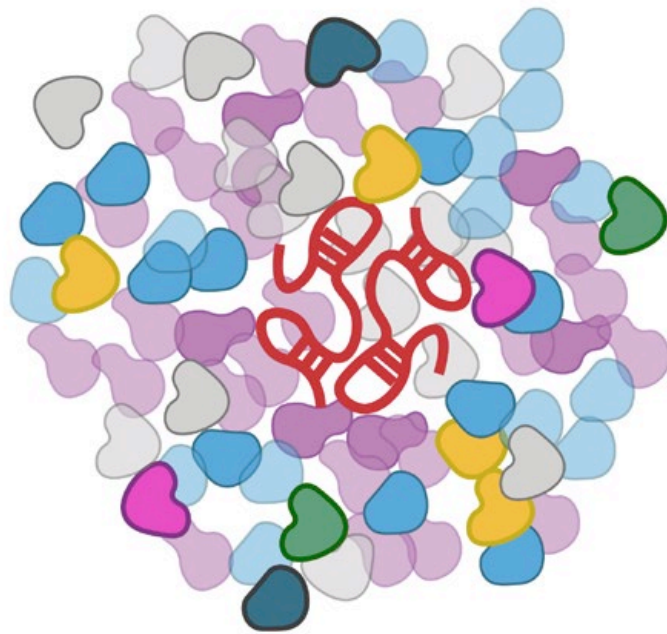


ILLUSTRATION: COURTESY OF DR. YOLANDA MARKAKI

Two Xist RNA molecules recruit a large number of proteins via RNA-protein and protein-protein interactions to form supramolecular complexes. Fifty of these complexes induce the formation of the inactive X chromosome.

Super-Resolution Microscopy Sheds New Light on Process of Embryonic Development

individual molecules with fluorescence and used super-resolution microscopy to watch the movements of Xist and interacting proteins as X chromosomes were being inactivated in the embryonic stem cells of female mice. They discovered that pairs of Xist were located at just 50 spots along the chromosome, for a total of 100 molecules of Xist.

“It was kind of shocking to us that from just 50 sites, Xist manages to silence a thousand genes,” says associate project scientist Yolanda Markaki, PhD. Instead of interacting

directly with every gene on the chromosome, the Xist pairs act as protein magnets, recruiting thousands of proteins to their spots on the chromosome. The chromosome is then pulled into a tightly condensed shape so that every section is in the vicinity of one of these 50 large clouds of proteins. From there, gene-silencing proteins within these complexes bind to each gene, shutting it off.

“The key insight here is that Xist RNA is not acting directly on the X chromosome, but is more of an architectural molecule that sets up proteins to

“X inactivation is one of the most fundamentally important processes in development, and I think this study is a slam dunk in finally understanding it.”

do their job,” Dr. Plath says. “Now we know that to silence an entire chromosome, you only need 100 Xist molecules, so it’s easy to see how a few molecules are sufficient to set up little compartments of gene regulation.”

The observations also could point to new ways of treating diseases, she says. For example, the reactivation of the silenced X may serve as a strategy to treat diseases associated with the X chromosome in females, such as Rett syndrome.

— **Sarah C.P. Williams**

“Xist Nucleates Local Protein Gradients to Propagate Silencing across the X Chromosome,” *Cell*, November 4, 2021

VR Experiment Offers New Insights into How Neurons Enable Learning



IMAGE: MEHTA LAB/UCLA

UCLA scientists observed the activity of large numbers of neurons in the brains of rats while the animals navigated a virtual-reality maze.

WHILE STUDYING RATS IN A VIRTUAL-REALITY MAZE, UCLA scientists discovered responses in their neurons that revealed a specific mechanism for navigation. Their study could be an important step toward the development of treatments for neurological disorders such as Alzheimer’s disease, schizophrenia and epilepsy, all of which are related to dysfunction in the hippocampus.

Scientists have long understood that the hippocampus is important for memory, learning and navigation. Mayank Mehta, PhD, professor of neurology, neurobiology and physics, and fellow researchers are gaining a deeper understanding of how the hippocampus works on a circuit level — that is, functions involving networks of millions of neurons.

The experiment used a type of virtual-reality system that was developed in Dr. Mehta’s lab. The technology is intended to keep the animals comfortable and avoid causing

dizziness and other symptoms that other VR systems can trigger.

For the study, rats were placed on a small treadmill inside a box with images of a maze projected onto the container’s walls. The rats were encouraged to run through the maze to find their reward, a drop of sugar water. To do so, they needed to discern where they were in relation to the virtual objects around them, where they needed to go to receive their rewards and how far away the destination was.

The scientists observed that hippocampal neurons encoded multiple aspects of the animal’s location — where it was in space, the angle of its body relative to its reward and how far it had moved along its path — a phenomenon called “multiplexing.” That finding is significant because it had been widely thought that neurons in the hippocampus code only for position.

“We found that the neurons carry very little information about the rat’s position,” Dr. Mehta says. “Instead, most neurons encode for other aspects of navigation, such as distance traveled and which direction the body is heading.” The scientists also observed that as the rats gained experience in the maze, their neurons “remembered” the maze even more reliably and accurately.

Research in Dr. Mehta’s lab and elsewhere over the past 25 years has shown that such changes in neurons’ activity — or neuroplasticity — occur via a process neuroscientists call Hebbian learning. That process is mediated by a neurochemical called NMDA, which is a common target for drugs used to treat neurological disorders.

Dr. Mehta says the neuroplasticity scientists observed in the rats is likely due to Hebbian learning across billions of synapses. That conclusion was further supported when the researchers injected the animals with substances to inhibit their NMDA, and their performance in the maze was impaired.

— **Lisa Garibay**

“We found that the neurons carry very little information about the rat’s position. Instead, most neurons encode for other aspects of navigation, such as distance traveled and which direction the body is heading.”

“Linking Hippocampal Multiplexed Tuning, Hebbian Plasticity and Navigation,” *Nature*, October 20, 2021

Ticket to a Longer-Lasting COVID Vaccine?

RARE, NATURALLY OCCURRING T CELLS that are capable of targeting a protein found in SARS-CoV-2 and a range of other coronaviruses have been identified by researchers at the Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research at UCLA. The study findings suggest that a component of this protein, called viral polymerase, could potentially be added to COVID-19 vaccines to create a longer-lasting immune response and increase protection against new variants of the virus.

More than 6 million people have died from

COVID-19 worldwide. Current vaccines provide significant protection against severe disease. However, newer variants — such as delta and omicron — carry mutations to the coronavirus spike protein, which can make them less recognizable to the immune cells and antibodies stimulated by vaccination. Researchers say that a new generation of vaccines will likely be needed to create a more robust and wide-ranging immune response capable of beating back current variants and those that may arise in the future.

One way to accomplish this is by adding a fragment

of a different viral protein to vaccines — one that is less prone to mutations than the spike protein and that will activate the immune system's T cells. T cells are equipped with molecular receptors on their surfaces that recognize foreign protein fragments called antigens. When a T cell encounters an antigen its receptor recognizes, it self-replicates and produces additional immune cells, some of which target and kill infected cells immediately and others that remain in the body for decades to fight that same infection should it ever return.

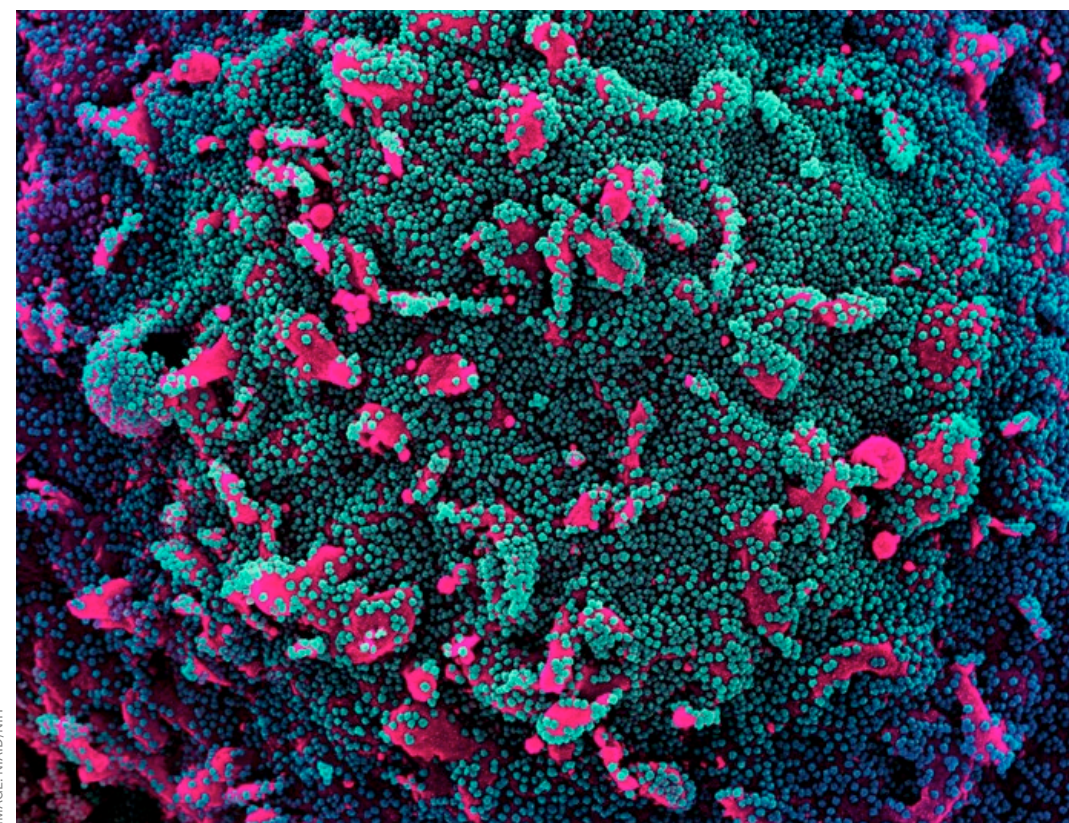
The researchers, including graduate student Pavlo Nesterenko and Owen Witte, MD, University Professor of Microbiology, Immunology and Molecular Genetics and President's

Chair in Developmental Immunology, focused on the viral polymerase protein. Viral polymerases serve as engines that coronaviruses use to make copies of themselves, enabling infection to spread. Unlike the spike protein, viral polymerases are unlikely to change or mutate, even as viruses evolve.

To determine whether or not the human immune system has T-cell receptors capable of recognizing viral polymerase, the researchers exposed blood samples from healthy human donors (collected prior to the COVID-19 pandemic) to the viral polymerase antigen. They found that certain T-cell receptors did, in fact, recognize the polymerase. They then used a method they developed called CLInt-Seq to genetically sequence these receptors. Next, the researchers engineered T cells to carry these polymerase-targeting receptors, which enabled them to study the receptors' ability to recognize and kill SARS-CoV-2 and other coronaviruses.

The new UCLA findings point toward a strategy that may help increase protection and long-term immunity, with researchers now conducting further studies to evaluate viral polymerase as a potential new vaccine component.

— **Tiare Dunlap**



Microscopic image showing a human cell (pink) heavily infected with SARS-CoV-2 virus particles (green and purple).

"HLA-A*02:01 Restricted T Cell Receptors Against the Highly Conserved SARS-CoV-2 Polymerase Cross-React with Human Coronaviruses," *Cell Reports*, December 9, 2021



Collection of photos of Marley Gaskins, including with Dr. Donald Kohn (top right).

Gene Therapy Gives New Life to Girl Born with Fatal Immune Disorder

TWELVE-YEAR-OLD MARLEY GASKINS was born with a one-in-a-million genetic disorder called leukocyte adhesion deficiency-1, or LAD-1, which cripples the immune system and results in recurring infections, coupled with slow wound healing. "She started getting what looked like ant bites on her skin when she turned 1," says Marley's mother, Tamara Hogue. "When she was 3, she got a really big skin abscess on her stomach that landed her in the hospital for five weeks." Eventually, Marley needed round-the-clock attention for the infections.

Due to a defective gene, the child was missing a protein that enables white blood cells to stick to the

walls of blood vessels — a crucial step these cells take before moving outside the vessel walls and into tissues to fight infections. Most children with Marley's disorder, if untreated, die before the age of 2.

Doctors in her home state of Florida said the only possible cure would be a bone-marrow transplant from a matched donor. Tamara said Marley's doctors couldn't even provide a survival rate for LAD-1 patients who undergo transplantation because so few people are diagnosed with the disorder.

The mother's search for other treatment options led her to Donald Kohn, MD, Distinguished Professor of Microbiology, Immunology

& Molecular Genetics, Pediatrics and Molecular & Medical Pharmacology, and director of the UCLA Human Gene and Cell Therapy Program. He was leading a new clinical trial for children with LAD-1 in which doctors collect blood-forming stem cells with the defective gene from the child, add in a healthy copy of the gene in the lab and then return the corrected cells to the child's body.

The therapy works by prompting the child's body to create a continuous supply of healthy white blood cells capable of fighting infection. Because the corrected cells are the patient's own, there is no risk of rejection, making the treatment less risky than a bone-marrow transplant.

Marley became the first LAD-1 patient ever to receive the stem-cell gene therapy. "One month after, she was already feeling pretty well and her immune system was working great," says

Dr. Kohn, who is a member of the Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research at UCLA and the Jonsson Comprehensive Cancer Center.

Dr. Kohn recently reported at a meeting of the American Society of Hematology that Marley and five other children who received the gene therapy at UCLA remain healthy and disease-free. Doctors expect that the one-time therapy will keep LAD-1 patients healthy for life.

"One month after, she was already feeling pretty well and her immune system was working great."

More than two years out of treatment, Marley is experiencing a lot of firsts: first time camping, first time getting her ears pierced and first time going to what she calls "big school" this year. "She tells me that she's thankful she has a story that makes her unique," Tamara says. "Now she shares her journey with kids at school to give others courage and hope." — **Linda Wang**

Researchers Discover an Unexpected Regulator of Heart Repair

CARDIAC-MUSCLE CELLS PLAY A PIVOTAL ROLE in determining how the heart heals following a heart attack, a mouse study by scientists at the Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research at UCLA reveals. The findings challenge a longstanding paradigm about heart repair and identify a protein that could serve as a target for drugs to treat or prevent heart failure.

Heart attack is the leading cause of heart failure, which kills more than 600,000 people in the U.S. each year. An optimal repair response is critical for minimizing the amount of scarring after a heart attack because, once formed, heart scar tissue remains for life and reduces

the heart's ability to pump blood. This adds strain to the remaining heart muscle which, over time, can lead to the development of heart failure.

Heart-muscle tissue is made up of cardiac-muscle cells, which are responsible for the heart's ability to pump blood. Because these cells have a very limited ability to self-replicate, they are unable to generate sufficient cardiac-muscle cells to replace the tissue that is damaged in a heart attack. Instead, the heart produces scar tissue to preserve its structural integrity. It had been thought that cardiac-muscle cells play a minimal role in scarring and the heart's repair process.

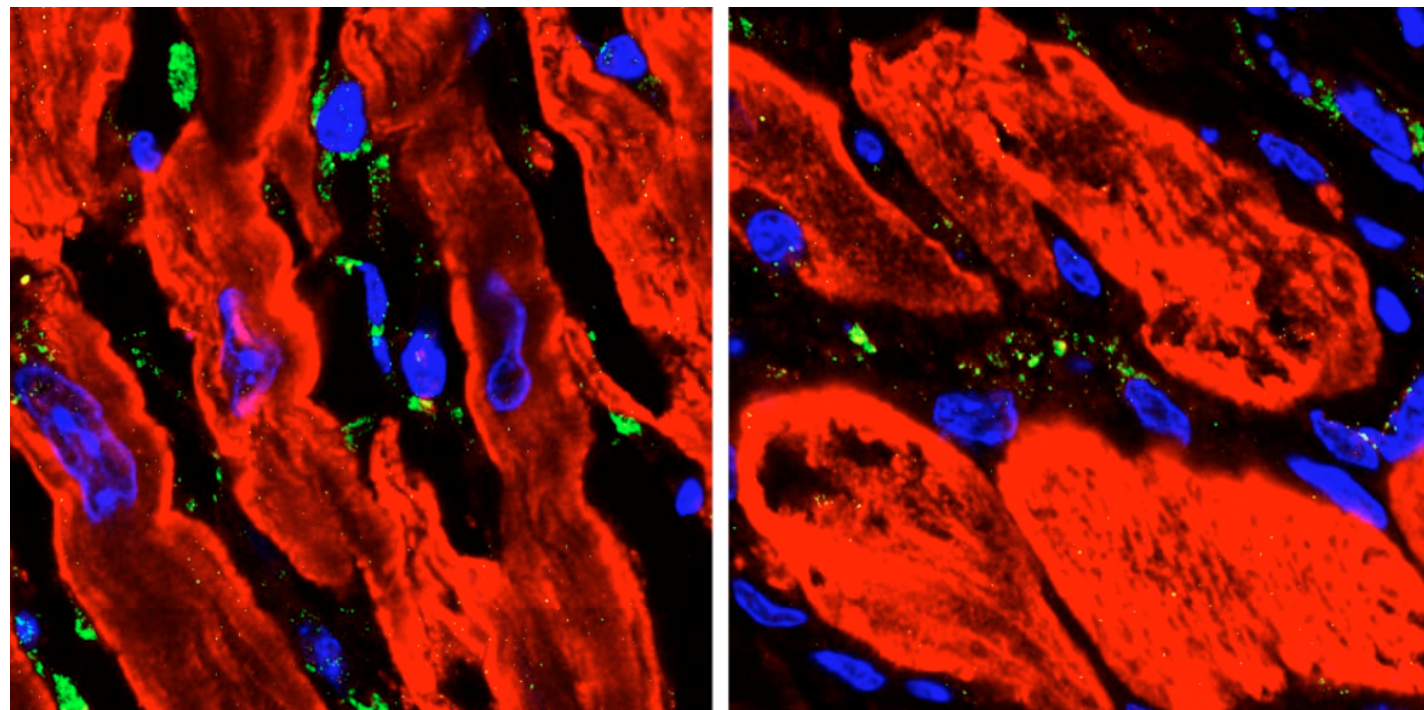
The researchers studied

tissue from the hearts of healthy mice and the hearts of mice that were in the first three weeks of recovery from heart attacks. The scientists found that heart-tissue samples from the post-heart-attack mice had increased levels of a protein called ENPP1. Next, they discovered that ENPP1 turns ATP, a molecule that is released by the dying cardiac-muscle cells, into another molecule called AMP. The surviving cardiac-muscle cells sense the presence of AMP as a signal that the heart is under attack, which prompts them to release specific molecules that cause the non-muscle cells around them to die. The researchers found that blocking the production of ENPP1 enhanced heart

repair and reduced the formation of scar tissue, which in turn led to improved heart function.

Half of people with heart failure die within five years of their diagnosis, and there currently are no drugs that improve the heart's repair process after a heart attack. The new study suggests how the repair process could be modulated to improve outcomes and identifies specific molecular targets for new drugs. The researchers are currently studying one drug candidate that they found to effectively inhibit ENPP1 in mice and in human stem cell-derived cardiac-muscle cells. — **Tiare Dunlap**

*"Cardiomyocytes Disrupt Pyrimidine Biosynthesis in Nonmyocytes to Regulate Heart Repair," *Journal of Clinical Investigation*, November 23, 2021*



Microscopic images showing heart tissue in mice (with cardiac-muscle cells in red) after a heart attack. Untreated tissue (left) shows more DNA damage (green) than tissue that has been treated with an experimental drug (right).

Removing Some Chemical Messengers in the Brain May Ease Opioid Withdrawal

REMOVING CHEMICAL MESSENGERS IN THE BRAIN that are involved in both wakefulness and addiction may make withdrawal from opioids easier and help prevent relapse, according to a mouse study led by researchers at the Jane and Terry Semel Institute for Neuroscience and Human Behavior at UCLA and the Veterans Administration Greater Los Angeles Healthcare System.

Hypocretin (also called orexin) is a chemical messenger important in the regulation of sleep and wakefulness. In 2000, UCLA sleep researchers discovered that human narcolepsy — a condition where people are overwhelmed with daytime drowsiness and sudden attacks of sleep — was caused by a loss of roughly 90% of the 80,000 brain cells containing hypocretin. Typically, people with narcolepsy are treated with drugs that for most people would be highly addictive; interestingly, these patients show few, if any, signs of drug addiction or withdrawal themselves.

The lack of hypocretin-producing neurons and addiction seen in narcolepsy took on a different twist when, nearly two decades later, the researchers made the surprising discovery that the brains of people addicted to heroin have, on average, 54% more hypocretin-producing neurons than those of people who don't have a substance-abuse disorder — and confirmed the same finding in mice.

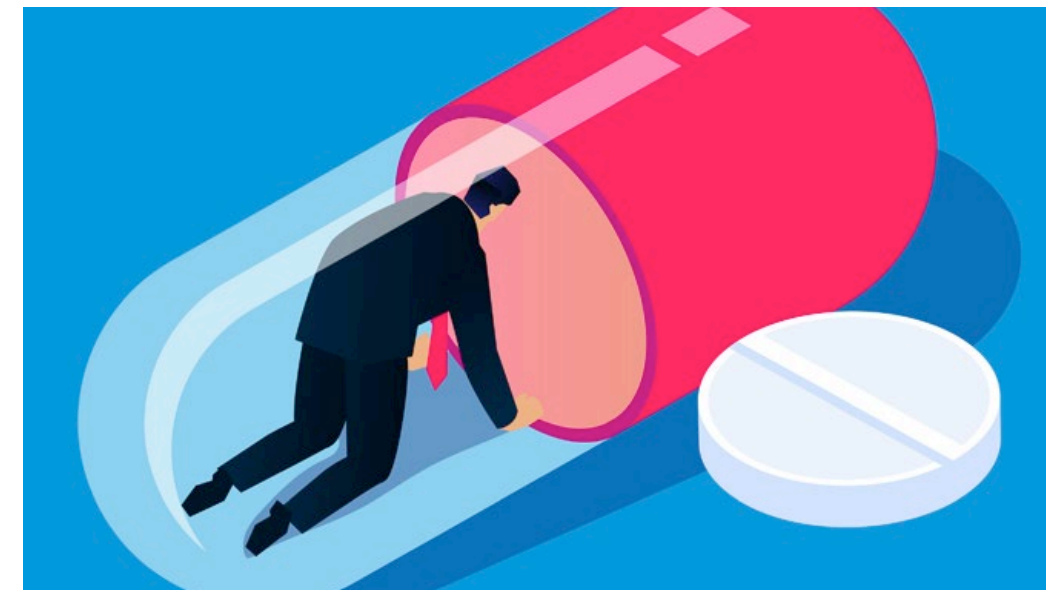


ILLUSTRATION: ISTOCK

However, when they stopped the opioid treatment in the mice, the researchers found that the increase in hypocretin remained, lasting as long as four weeks. This finding suggested that continued elevated levels of

hypocretin could play a role in drug cravings, and, at the same time, shed light on why narcoleptic patients with very few of these hypocretin-producing neurons show few, if any, signs of addiction.

While human studies are needed to confirm these findings, they suggest that developing drugs that target the hypocretin system may help treat addiction. In addition, researchers found that the increased amounts of hypocretin present in the locus coeruleus (LC) were directly involved in increasing the levels of an enzyme called tyrosine hydroxylase (TH), which is responsible for making norepinephrine (NE), a naturally occurring neurochemical in the body. Neurons in the LC produce NE and distribute it to other parts of the brain, where it stimulates functions such as arousal, wakefulness, attention or a "fight-or-flight"

stress response. When opioids are stopped, the activity of the LC greatly increases, causing more NE to be released, which is widely thought to play a principal role in opioid-withdrawal symptoms.

Thus, the researchers hypothesized that removal of hypocretin-producing neurons would lessen the signs of withdrawal in the mice. Their findings confirmed this hypothesis by showing that the lack of hypocretin-producing neurons reduced both the physical and emotional symptoms of opioid withdrawal and stopped the increase in the levels of TH in the LC.

— **David Sampson**

*"Hypocretin/Orexin Interactions with Norepinephrine Contribute to the Opiate Withdrawal Syndrome," *Journal of Neuroscience*, January 12, 2022*

Brains of people addicted to heroin have, on average, 54% more hypocretin-producing neurons than those of people who don't have a substance-abuse disorder.

FOR THE LOVE OF RACHEL

Motivated by her sister's life experience, Dr. Emily Hotez is dedicated to educating medical students and physicians about how to improve their interactions with patients with intellectual and developmental disabilities.

Emily Hotez, PhD

*Assistant Professor of Medicine,
Division of General Internal Medicine
and Health Services Research*

Growing up with a sister on the autism spectrum, Emily Hotez, PhD, frequently took notice of the ways her sibling's life experience differed from her own. One area in which the contrast was stark was in their interactions with doctors. "Watching Rachel interact with the health care system," Dr. Hotez says, "was like watching a square peg try to fit in a round hole." A developmental-psychologist researcher, Dr. Hotez is on the leadership team of the Autism Intervention Research Network on Physical Health, a UCLA-led national network that promotes the physical health and well-being of autistic individuals. She spoke with author Tom Fields-Meyer, whose memoir *Following Ezra: What One Father Learned About Gumby, Otters, Autism, and Love from His Extraordinary Son* was a finalist for the National Jewish Book Award, about her work to help educate medical students and practicing physicians to improve their interactions with marginalized groups, including those with intellectual and developmental disabilities (known as IDD).



Your work focused on the IDD population is pioneering. What led you to it?

Dr. Emily Hotez: My first research experience as an undergraduate was interviewing the parents of adolescents to understand how they worked together to parent their children. It became readily apparent to me that there are a lot of overlaps among marginalized groups. People with intellectual and developmental disabilities, like my sister, have a lot of the same struggles as other marginalized groups who experience health disparities. I was drawn to this work because I learned that designing and implementing research studies that are aligned with the priorities, needs and experiences of the populations they seek to serve can have an important impact on health policy and practice — particularly for people like Rachel and those in other marginalized groups who have historically been excluded from the research process.

You've written about how you were struck by your sister's challenging health care experiences. In what circumstances do you see that?

Dr. Hotez: One example of this is routine dental appointments. Her anxiety manifests in incessant inquiries about when a procedure will be over. That's something that most of us think, but we don't say out loud. Often in such situations, the patient will be referred to a specialist who has some expertise in working with IDD populations. But why does she need to see a dentist with IDD expertise? And how many dentists with self-proclaimed IDD expertise even exist? This practice of referring to specialists with this kind of expertise results in lots of handoffs and referrals across the health care system, and it creates fragmented care and defers the actual treatment that the person needs. Rachel is not alone in having these challenges. I've witnessed countless health care providers give up when routine procedures cannot be implemented by the book rather than try to offer accommodations. Research has shown that many practitioners have a lot of trouble offering accommodations consistent with the ADA [Americans with Disabilities Act], such as longer appointment times, or changing the clinic environment, or using communication strategies that are accessible to everyone, like integrating verbal and visual information when they are communicating with patients. That's why Rachel and so many others like her struggle in health care interactions.

Why are doctors, for the most part, so unprepared to interact with patients with IDDs?

Dr. Hotez: Much of it has to do with stigma. When people hear the word "stigma," they might imagine an autistic child being bullied on the playground or an adult with a learning disability being discriminated against in the workplace. But stigma isn't always overt or malicious. We all have implicit biases or preconceptions about people with certain conditions, identities or characteristics. Many harmful biases originate well before doctors become doctors. Stigma and bias originate in childhood, sometimes as young as 9 years old. Children are less likely



PHOTO: ADAM AMENGUVAL

to want to socialize with children with IDDs. This leads them to distance themselves. And this distance amplifies over the course of a lifetime. When we become adults, we often have very little contact with people with IDDs because we've internalized this lifelong stigma that has led us to distance ourselves from them. By the time students get to medical school, many of them have never interacted with someone with IDDs. And medical education is like drinking from a firehose; there are so many priorities and competing interests. Students have vast swaths of information to cover, and IDD issues simply are not prioritized. So, new doctors leave medical school with the same biases that they had about people with IDDs when they entered. That combination of bias and lack of training and education tends to perpetuate the stigma.

And it is doctors carrying that stigma around with them that leads to those disparities in care?

Dr. Hotez: Physicians often presume that patients with IDDs will not understand something, so they communicate exclusively with the parent or caregiver. If they're not speaking directly to their patient, the physician is not getting a sense of the patient's specific needs, experiences and priorities. It also prevents the patient from feeling comfortable in initiating conversations about specific concerns, which can be detrimental for health. Physicians may also gloss over important treatment details, presuming they're too complicated for the patient to understand. Then patients can have challenges following through with treatment recommendations because they simply don't know what they need to do. A more subtle problem is when physicians attribute a patient's health concerns solely to the disability. That

is often at the expense of making a concerted effort to investigate and treat the patient's concerns. That can result in unaddressed health conditions.

Your research shows that in reaction to that phenomenon, patients often conceal their disabilities.

Dr. Hotez: We've learned a lot about camouflaging. People with IDDs often go into a doctor's office expecting that they're going to have to fend off various biases or preconceptions about themselves. Autistic individuals report overcompensating by making eye contact, trying to suppress repetitive behaviors that may help them cope with sensory challenges and by other behavioral adjustments that might hide their autistic traits from the world. This is problematic, and research shows that camouflaging leads to a lot of detrimental mental and physical health outcomes: distress, poor sense of well-being, low self-esteem, heightened anxiety, depression — even suicidality. It can also delay diagnosis. So, it is important for health care providers to consider their office cultures and health care environments so that people with IDDs don't come to their clinics with the expectation that they are going to experience stigma, bias or discrimination.

How has the COVID-19 pandemic exacerbated these problems?

Dr. Hotez: People with IDDs were disproportionately more likely to contract COVID and die from COVID than the general population. This was among the issues that arose during the pandemic that put a magnifying glass to the health disparities that people with IDDs, among other marginalized populations, face. COVID fragmented services, dismantled support systems and disrupted routines, exacerbating already-existing disparities in health care. I initially turned my attention to the concept of stigma because my colleagues and I were concerned when people with IDDs were largely excluded from the initial COVID-19 vaccination priority guidelines. We knew this is a population that is disproportionately likely to experience a host of negative health outcomes — both before and during the pandemic. So, why were they excluded? Digging a little further, it became clear that policymakers simply didn't have the data to support including people with IDDs in the priority guidelines. That is a result of a vicious cycle of stigmatization that involves lack of research of this population, lack of inclusion, and lack of focused policy and practice, all of which perpetuates ongoing health care disparities.

How, then, are you trying to address these problems in your work?

Dr. Hotez: There are a number of things going on here, at UCLA. In the school of medicine, there is the Disability Curriculum Initiative. It's run by a group of students who are extremely committed to improving medical education around disability and stigma. They have been working over the past couple of years to create programming that can be integrated into the

medical school curriculum. Many of these students were heavily involved in creating a set of disability-focused workshops as part of the medical school's orientation program for incoming first-year students. The fact that it is student-driven makes it scalable and will ensure that it can fit in with a lot of the competing priorities that medical students have. There also is work being done that was spurred by concerns voiced by the American College of Preventive Medicine about COVID outcomes for minority groups across the board. They asked physician-led practices to propose initiatives to improve health outcomes for these populations during the pandemic. At UCLA, we have focused our attention on the IDD and LGBTQ+ communities across two clinics — the Santa Monica Gender Health Clinic and the UC-Leadership Education in Neurodiversity Program clinic — to implement initiatives to improve data tracking and the resources available to these patients.

“There need to be bidirectional efforts, both to promote self-advocacy and to ensure that environmental supports are in place.”

What suggestions do you have to help people with IDDs and their families navigate the health care system?

Dr. Hotez: The advice traditionally has been to work on cultivating self-advocacy skills — making sure that they are equipped with the knowledge and the skills to overcome the many barriers that they're going to encounter in the health care system. Self-advocacy is an extremely important set of skills and capacities to foster. But the onus cannot simply be on the patient or the patient's family. There need to be bidirectional efforts, both to promote self-advocacy and to ensure that environmental supports are in place and that systemic barriers are dismantled so that interactions within the health care setting are positive, benefit patients and promote their health. It doesn't have to be complicated or costly. There are many small things that can be done with few or no resources to make the patient's experience much more positive. For example, my sister recently had a dentist appointment. In the office, they played rap music for her the whole time she was there, because that's what she likes. And she was comfortable — or as comfortable as anyone can be at the dentist. That was something that was easy for the dentist and staff to do, and it didn't require any training on their part. But for my sister, it made the environment that much more welcoming and comfortable, and this time her appointment went very well. ●

Insights in a Petri Dish

RANMAL A. SAMARASINGHE, MD
(RES '17, FEL '20), PHD

Assistant Professor of Neurology

As a clinical neurophysiologist, Dr. Ranmal A. Samarasinghe manages patients with epilepsy, and his research focuses on understanding its underlying causes and those of related disorders like autism. To do so, his lab grows and studies 3D structures called human-brain organoids. Generated from the stem cells of individual patients, these organoids can mimic some of the neural-circuit abnormalities seen in the brains of patients with epilepsy and can provide unique insights into the causes of human neurological diseases. Dr. Samarasinghe hopes that his work will reveal why some patients do not respond to current therapies and inform the development of new treatments and cures.

WHEN DID YOU FIRST START TO THINK ABOUT SCIENCE?

I think I was about 5 or 6 years old. My dad had this Charlie Brown book called "The First Book of Science," or something like that, and he was teaching me about chlorophyll and photosynthesis. He was telling me, "This is science. If you're interested, maybe this is something you can do." I remember thinking, "Oh, OK, maybe I can do that." There was another chapter that talked about how you could tell how old a tree is by counting its rings, and I thought that was the most amazing thing. After that, if I saw a tree that had been cut, I would try to count the rings. I still do that sometimes.

WHAT WAS YOUR FIRST EXPERIMENT?

My first real experiment probably was in the fourth grade. My teacher —

I still remember him, Tom Ferry — was really into isopods, those little bugs that roll up into a ball if you touch them, and we did an experiment to see how they would behave in response to heat or cold. We made a foil bridge and put the isopods on it, with a heat lamp at one end and a shaded area cooled with ice at the other. Our hypothesis was that they would prefer the cool, shaded area, and that's just what they did.

WHAT HAS BEEN THE GREATEST CHALLENGE IN YOUR WORK?

Just having the confidence to do it can be a big challenge. I'm surrounded by people who are super-accomplished and so smart, so, sometimes it feels like a challenge to just put my head down and do the work.

WHERE DOES YOUR INSPIRATION COME FROM?

It is jarring and sad to see children in the epileptic encephalopathy clinic who have such difficult medical issues and the devastating impact that has on their lives and on their families. I am a parent now, and perhaps that makes me even more motivated. Wanting to do something to help them is where the inspiration comes from.

WHO IS YOUR SCIENCE HERO?

I don't know that I have a hero, per se, but there are people who have made a big difference in my life. Mr. Ferry, my fourth-grade teacher, was one of them. I wasn't very good in school, but he took an interest in me and he was supportive and guided me toward believing that I wasn't as bad as I thought I was. The first scientist who

really inspired me to pursue research was Dr. Keiko Ozato at the National Institutes of Health. I worked in her lab as a post-baccalaureate trainee, and she was my first real scientific mentor.

WHERE ARE YOU HAPPIEST?

With my wife and kids at home or wherever we are together. We have two girls, 5-1/2 and 2-1/2 — and a third child on the way — and I am happiest being with them and doing whatever it is they want to do.

WHAT DO YOU CONSIDER TO BE YOUR FINEST ACHIEVEMENT?

I'm still working on it.

WHAT ARE THE QUALITIES OF A GREAT SCIENTIST?

Healthy skepticism and persistence. There is a lot of failure when you do science. So much of it doesn't work out the way you expect, and so you have to be persistent in your pursuit. And you also have to be skeptical even of your own results and not take them at face value. Your hypothesis may seem to be correct, but it could prove to be wrong in the future based on new evidence.

WHAT IS YOUR GREATEST VIRTUE?

I'd say I'm pretty persistent.

WHAT IS YOUR GREATEST FAULT?

I can be impatient. Sometimes I need to take a step back and slow down.

WHAT IS YOUR MOTTO?

There's always tomorrow.

WHAT DO YOU VALUE MOST IN YOUR COLLEAGUES AND STUDENTS?

Their honesty. From my students, an honest effort in the lab, and from my colleagues, honest feedback and collaboration.

WHOM DO YOU MOST ADMIRE?

My wife. She is an MD/PhD in the Department of Emergency Medicine and Orthopaedics. Despite her own busy schedule, by sharing and helping with both household/childcare and other tasks, being a sounding board for managing lab-related issues both

scientific and otherwise, reading manuscripts and grant proposals, she plays a very significant role in making it possible for me to pursue my work and succeed as a scientist. I probably should tell her more often how much I appreciate and admire her.

WHEN DO YOU NOT THINK ABOUT SCIENCE?

I may think about science when I'm running or biking and I have a clear head to think about a problem, and, of course, when I am focused on my work in the lab. But there are lots of other times during the day when I'm not thinking about it at all — I'm thinking about my wife or my kids or what is going on in the world.

IF NOT A SCIENTIST, WHAT WOULD YOU BE?

If I had the ability, I would want to be a professional cyclist. But since I don't have that level of talent and it is not something that's ever going to happen, I think I would have been a political scientist or political economist. In addition to biology, my first degree was in economics. I still think about that stuff and read about it for fun.

TO WHICH SUPERHERO DO YOU MOST RELATE?

I can tell you who I admire. I admire someone like Rey from *Star Wars*, or even the Wolverine. They are characters who could've very easily been villains; terrible things were done to them or happened to them when they were growing up. But they didn't become villains. They became heroes, but there's still a dark side to them that they had to overcome and, in the case of Rey, kind of become the epitome of good.

WHAT ARE YOU MOST COMPULSIVE ABOUT?

Probably getting in my run. I run only three-to-six miles, but I do it six days a week, and I bike on the day I don't run. I haven't skipped a day in over a year-and-a-half.

HOW DO YOU WANT TO CHANGE THE WORLD?

I want to raise children who grow up to be productive and good citizens who contribute to making the world better. And I want them to be happy. I don't yet know if what I do in the lab or in

clinic will make a significant impact, but I am optimistic that if my kids grow up to be good citizens and are happy, the world will be better off for it.

WHAT IS YOUR DEFINITION OF HAPPINESS?

Spending time with my family.

WHAT IS YOUR DEFINITION OF MISERY?

Being alone.

WHAT MUSIC DO YOU LISTEN TO WHILE YOU WORK?

I'm a bassist, and I like to listen to musicians like Jaco Pastorius, MMW [Medeski, Martin and Wood] and Galactic — sort of funk, jazz, beat stuff. And I'll also listen to Led Zeppelin, Jimi Hendrix and music like that. That's what I listened to in high school; there were four of us nerds who just wanted to listen to that music and play that music all the time. With music like MMW, I can have it on in the background and work, and I feel I can be productive. With some other music, I have to just stop what I am doing and listen and kind of get lost in it. ●



ILLUSTRATION: JASON RAISH

HUMAN TOUCH

By Claire Panosian Dunavan, MD
Illustrations by Parko Polo

**THE DAVID GEFFEN SCHOOL OF MEDICINE AT UCLA
LAUNCHES A NEW HUMANITIES CURRICULUM TO
FOSTER CRITICAL THINKING AND INSIGHT INTO
THE HUMAN CONDITION WHILE EDUCATING FUTURE
PHYSICIANS TO CARE FOR THEMSELVES AS WELL AS
THEIR PATIENTS.**



PHOTO: JOSHUA SUDOCK

Students joined staff of the Hammer Museum at UCLA in the Franklin D. Murphy Sculpture Garden to do exercises focused on observation, perspective and critical reflection.

“Earth to Rich. Earth to Rich,” my medical school pal whispered to her lab partner. Although the room reeked of formalin and our classmates had already gathered into noisy groups of four, the dreamy-eyed boy was lost in another time and place.

“Where are you?” Sandy asked, her concern growing. “We need to start. Today, we’re dissecting the face.”

“In my head — I was playing in a symphony,” Rich sighed, as if waking from a dream. “It was beautiful.” Then, as his bliss ebbed, he turned his gaze to the embalmed cadaver in a cold, metal box, its remnants worn and ragged after months of educating students about the intricacies of the human body.

“Okay, now I’m ready,” Rich said. “Where’s the nose?”

This story from my past — truthful, funny, perhaps a bit sad — will likely resonate with many doctors who studied medicine in the 1970s. To my friend, Sandy, a recently retired pediatrician, it is as vivid today as it was when she first witnessed Rich’s brief escape from yet another grueling stint in gross-anatomy lab. Nor has Rich, a gifted trumpet player who before starting medical school had already vied for a spot with the St. Louis Symphony Orchestra, forgotten his painful choice of medicine over music. Not long ago, I, too, recalled Rich’s plight after speaking with David C. Schaberg, PhD, a scholar of Asian languages and cultures and dean of humanities at UCLA. “I think of physicians — or many of them — as high achievers who proved their abilities in other ways before they became physicians, for example, by brilliantly playing a musical instrument or through other humanistic achievements,” he says. “Among other things, achievements in the arts and the humanities are ways we prove ourselves as young people.

“But what happens to that paideia” — that childhood education that can foster talents and skills — “as you enter a profession? You can lose it,” Dr. Schaberg says. “And I think a lot of people go right ahead and do that. But you can also keep and develop those early elements of excellence and sustain yourself with them.”

Sustaining physicians, nurturing their souls and enhancing compassion and communication with patients are among the reasons why Clarence H. Braddock III, MD, MPH, dean of medical education in the David Geffen School of Medicine at UCLA, made the decision to embed medical humanities within a visionary redesign of the medical school’s curriculum. But to Dr. Braddock, these goals only scratch the surface of what medical humanities can impart to future physicians.

“One would be the skill of observation, developed through the structured and methodical process of studying a sculpture or painting and cultivating a discerning eye,” Dr. Braddock says. “The second would be to recognize the power of stories. Of course, every patient has a story, which typically is about their present illness. But that is part of a larger story, which is a patient’s life narrative. Finally,” Dr. Braddock continues, “I can’t think of any better way to say it than this: Humanities enrich the soul. Medicine is a career that’s very busy and can easily squeeze out anything else. Beyond what little time is left to connect with your family, the role of literature,

“MEDICAL HUMANITIES IS SUCH A VITAL AND GROWING AREA, AND SERVING AS CHAIR IS A GREAT OPPORTUNITY TO WORK WITH PEOPLE ACROSS THE CAMPUS, AND BEYOND, WHO ARE DOING IMPORTANT WORK IN THE HEALTH COMMUNITY.”



of film, of theater — you name it — is to encourage renewal and growth, a different part of existence that actually makes the physician more whole and resilient.”

To achieve those goals, Dr. Braddock needed an inspired leader to shape and guide the new humanities-related content. In April 2021, Whitney Arnold, PhD, director of the Undergraduate Research Center–Humanities, Arts and Social Sciences and adjunct assistant professor of comparative literature in the UCLA College, as well as adjunct assistant professor in the school of medicine, was appointed chair of the Medical and Health Humanities Theme. Taking on the role is a humbling and thrilling opportunity, she says. “Medical humanities is such a vital and growing area, and serving as chair is a great opportunity to work with people across the campus, and beyond, who are doing important work in the health community,” Dr. Arnold says.

Four months after her appointment, Dr. Arnold and Mark S. Litwin, MD (FEL ’93), chair of the UCLA Department of Urology, jointly led a session for entering medical students entitled, “Intro to Humanities and Narrative Medicine.” Additional sessions soon followed, including one in which staff of the Hammer Museum at UCLA joined students in the campus’s Franklin D. Murphy Sculpture Garden and led them in exercises focused on observation, perspective and critical reflection. On that same afternoon, a second exercise utilizing theater role-play

featured a scene from *Wit*, a 1999 Pulitzer Prize-winning play. In it, the two principal characters — one a brilliant, acerbic literary scholar with Stage IV ovarian cancer and the other a medical-oncology fellow who was once an undergraduate in the patient’s class — have their first, clearly fractured medical encounter.

Thus, a brave new initiative in medical pedagogy was launched.

WHAT IS MEDICAL HUMANITIES, ANYWAY? THE ANSWER ISN’T SIMPLE. A definition from a 2010 article in the journal *Hippokratia* reads: “Medical humanities is a multidisciplinary field, consisting of humanities (theory of literature and arts, philosophy, ethics, history and theology), social sciences (anthropology, psychology and sociology) and arts (literature, theater, cinema, music and visual arts) integrated in the ... curriculum of medical schools.”

The authors, all faculty at medical schools in Greece, then buttressed their case for adding humanities to a modern medical education. For starters, they state, decades of burgeoning scientific knowledge have required modern medical students to spend far more time than ever before in a day-in, day-out, mind-numbing routine of memorizing and processing information. The resulting mental overload can produce burn-out and, at the same time, detract from a “deeper seeing” of patients and ethical dilemmas.

A grounding in humanities provides a counterweight by adding aesthetic depth, yielding insights about human emotions and fostering imagination.

The article also linked desirable ends to specific activities and studies, as summarized below:

- » *Literature teaches about human behavior, emotions and narratives of illness.*
- » *Reading medical biographies allows students to find inspiration and role models in the lives of other physicians.*
- » *Exposing students to social sciences helps orient them to the cultural and social context of the diverse communities in which they will later practice.*
- » *Philosophy aids in developing analytical and synthetical reasoning and defining common values and beliefs.*
- » *Learning about the history of medicine leads to humility and an awareness that knowledge now considered unmistakably true may not prove so in the future.*

A final rationale for medical humanities is this: Incorporating humanities into medical school curricula can help open the door to discussing the emotional pain that sometimes accompanies clinical practice. Prior to our current, life-changing pandemic, heavy emotional burdens borne in silence arguably were among health care’s biggest “elephants-in-the-room.”

Several years ago, Dr. Schaberg, whose mother was a senior nurse on the oncology board of a Boston university hospital, explored this topic with UCLA Health interns, and he recounted for me some key take-aways. “Medical professionals — especially in American culture — can enter a zone where they’re not able to account for their own human needs,” Dr. Schaberg says. “In the talk I was having with these interns, we reflected on potential hidden burdens that anyone who’s been in a serious medical profession for a while has to be carrying. For example, ‘Did I make the right decision in that case?’ ‘Am I responsible for that?’ ‘How do I

deal with possible injuries connected to having such a heavy responsibility for other people?’

“Today, any of us who enters a doctor’s office notices how hard it is,” Dr. Schaberg adds. “My doctor’s glancing at his chart as he tells me about the progress of whatever disorder I’ve got. It’s an impaired human interaction.”

His conclusion: “If medical humanities can help doctors to better handle the daily demands of interacting with patients, doctors will preserve their own humanity in a less-wounded way.”

Dr. Braddock went even further. “Death, medical mistakes — all these things can be deeply traumatic. And then the question is, how do we make sense of them when they happen? We make sense of them through personal reflection and reflection with others, through a sense of being supported. The other antidote is feeling that — even at those dark moments — you have meaning and purpose.”

“MEDICAL HUMANITIES IS A MULTIDISCIPLINARY FIELD, CONSISTING OF HUMANITIES (THEORY OF LITERATURE AND ARTS, PHILOSOPHY, ETHICS, HISTORY AND THEOLOGY), SOCIAL SCIENCES (ANTHROPOLOGY, PSYCHOLOGY AND SOCIOLOGY) AND ARTS (LITERATURE, THEATER, CINEMA, MUSIC AND VISUAL ARTS) INTEGRATED IN THE ... CURRICULUM OF MEDICAL SCHOOLS.”

MEANING, PURPOSE AND SUPPORT WERE ALSO PART OF DR. ARNOLD'S PLAN when she intentionally wove “shared reflection” into several medical-humanities activities during this past academic year. For one first-year student, the approach has already proved helpful. After rotating in a student-run clinic for patients who were homeless and realizing how unequipped she was to help them, Grace Yi was concerned that she and other first-year students had been unwittingly complicit in a system that sometimes “places the brunt of medical training within underserved communities.” Yi explored her feelings in a medical-humanities writing assignment that she later shared in a small-group meeting with her peers.

“Initially, students were more resistant and were more on the side of, ‘Why are we spending three hours of our afternoon discussing things like this?’” Yi acknowledged. “But then, a lot of people shared similar concerns and turbulent feelings, and that led to a sense of solidarity and comfort when we sensed that others felt this way, too. It helped people grapple with those feelings, and also for them to start to think about what they could prioritize in order to help make change. I don’t think that would have happened organically. So, I do think that components of the medical-humanities curriculum have opened the door to having these more-frank conversations with classmates.”

Sentiments like these are affirming for Dr. Arnold, who has actively sought feedback from students during her inaugural year chairing the Medical and Health Humanities Theme. As she sees it, “The wonderful thing about this curriculum is that it has to be collaborative because it is basically about drawing forth individual voices and stories. And, so, it can’t just be me [who is] creating the curriculum; we need to get as many voices and perspectives as possible,” she says. “It’s been wonderful to collaborate with faculty, but it’s been really wonderful to collaborate with students, as well, because they are in the midst of it. In the process, they’re telling me what questions they have, what they’ve been wondering about and what has been difficult for them.”

Perhaps not coincidentally, Yi is among a growing number of students entering medical school who already have earned a graduate degree or who have major life experience under their belts. After double-majoring in cognitive science and history

of science, medicine and public health at Yale University, Yi began a master’s program in public health and spent a year in Macao, China, doing mental-health research among migrant workers in the Pearl River Delta. Her fieldwork entailed “hours of in-depth interviews with Filipina domestic workers — hours of unstructured conversations about daily routines, major life events and experiences, relationships with children and family, love from a distance,” Yi told me. She also wrote in an email to me: “I’ve found humanities to be deeply embedded within many scientific disciplines I’ve pursued. [I appreciate how] winding conversations and self-reflection add richness to understanding communities and individuals.”

Lauren Taiclet and Katie Thure, two second-year students who have regularly met with Dr. Arnold to discuss future directions for the medical-

humanities theme and served as mentor-educators for first-year students, also arrived at the David Geffen School of Medicine with unique backgrounds. First drawn to literature and philosophy in high school, Taiclet attended Dartmouth University, where she majored in neuroscience and also played competitive basketball. (The multiple injuries she sustained from the sport inspired her to start a disability-studies group in medical school at UCLA). She then moved to New York to work as a clinical-research-trials coordinator at New York-Presbyterian/Columbia Hospital, finally capping off her East Coast chapter by enrolling in Columbia’s well-known program in narrative medicine.

“At Columbia, I was really enjoying my team and my

work as a coordinator,” Taiclet says. “But sometimes I was a little unsure about the conversations around end-of-life care. We were working with rare cancers, and patients were traveling from all over the country, sometimes from overseas. So, at the same time the team was focusing on clinical information — which was their primary job — I felt that a lot of the patients’ stories went unexplored.”

She says that she pursued her masters in narrative medicine “because I wanted to explore end-of-life care and bioethics and patient-physician communication, the role of art in medicine, things that I wouldn’t have previously thought of. It’s been really helpful to have this completely different lens when I go through my courses now or when I interact with patients.”

“THE WONDERFUL THING ABOUT THIS CURRICULUM IS THAT IT HAS TO BE COLLABORATIVE BECAUSE IT IS BASICALLY ABOUT DRAWING FORTH INDIVIDUAL VOICES AND STORIES. AND, SO, IT CAN’T JUST BE ME [WHO IS] CREATING THE CURRICULUM; WE NEED TO GET AS MANY VOICES AND PERSPECTIVES AS POSSIBLE.”



Thure, on the other hand, came to higher education as a “first-gen” student. She grew up in the Antelope Valley, on the western tip of the Mojave Desert north of Los Angeles; her father was an ironworker and her mother didn’t earn a high school diploma until Thure was 6 years old. “But my mom’s thing was always making sure my brother and I had school. She was very militant about making sure we sat at the front of the class, finished our homework and were always asking questions to ignite a passion for learning. She didn’t really care what we did in terms of picking a major; she just wanted us to keep learning.”

After Thure graduated from UCLA with a degree in microbiology, immunology and molecular genetics and began a master’s in public health at Emory University, her mother was diagnosed with esophageal cancer, and she died three years later. Her mom’s illness, Thure now realizes, was her first intimate experience with medicine. Soon after, she took a job with the Tennessee Department of Health, tracking health care-associated infections and antimicrobial resistance. When she entered medical school at UCLA, Thure acknowledges that she had no real training in the humanities — but she definitely had instincts.

“I knew I wanted more human stuff in the curriculum. Not less science, but more human stuff to complement it. Seeing people not just as a decision tree, but as a human making a decision. That ties into humanities.”

Discussing her own journey, Thure circled back to a personal touchstone. “We are learning about complex medical decisions. In our doctoring course, we’re learning how to ask questions in empathetic ways. But I often think no one does a really good job of teaching us how to save ourselves. What the humanities curriculum offers, and Dr. Arnold has put in place in other sessions as well, is built-in self-reflection. That is important, because learning to give, for example, bad news does take a toll on us as human beings. Telling somebody that they’re going to pass

away or that there's not much more that can be done for them is emotionally taxing. It's important to give students a space to write it out in a judgment-free zone."

ALMOST 20 YEARS AGO, OXFORD UNIVERSITY PRESS PUBLISHED A BOOK BY RITA CHARON, MD, PHD, entitled *Narrative Medicine—Honoring the Stories of Illness*, and, in 2016, a second book, *The Principles and Practice of Narrative Medicine*, which she coauthored. An internist who also holds a doctorate in English literature, Dr. Charon began Columbia University's narrative-medicine program in 2000, and she is widely credited with launching a style of medicine, that, in Dr. Charon's own words, is "practiced with ... skills of recognizing, absorbing, interpreting and being moved by the stories of illness," thus enabling doctors to better engage with experiences and emotions that impact patients' health.

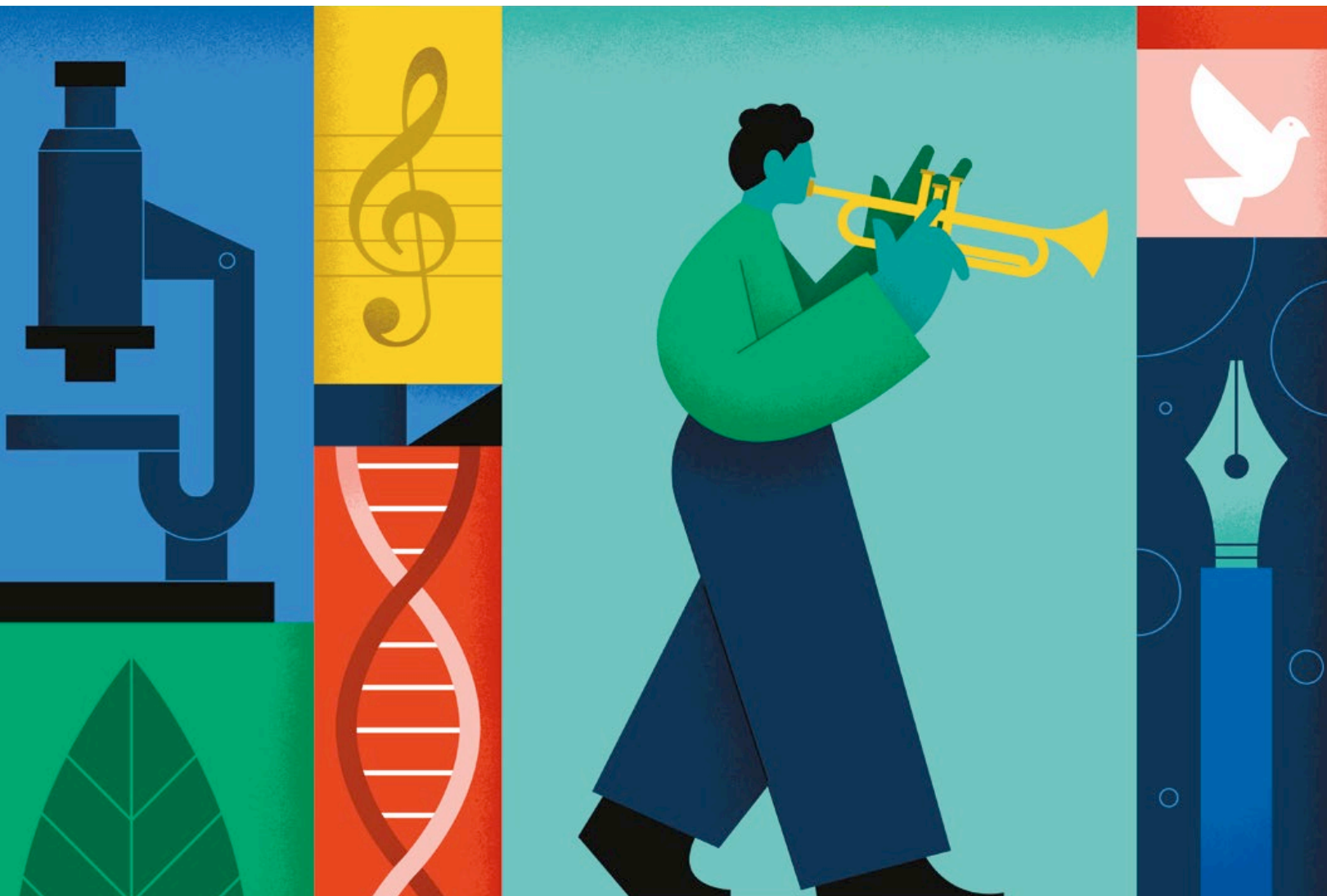
In August 2021, Dr. Arnold and Dr. Litwin inaugurated UCLA's new curricular theme built around Dr. Charon's framework for the Class of 2025 with their session, "Intro to Humanities and Narrative Medicine." They were natural partners. Dr. Arnold, whose academic career has focused on autobiographical texts, literary histories and accounts of health and illness, has always been drawn to narratives

and stories, and Dr. Litwin has loved writing since, as a high school student, he wrote a fictionalized story based on interviews with a survivor of the Holocaust.

"We live in stories in many ways," Dr. Arnold says. Whether it is reading literature, seeing a play or going to a movie, "stories affect us. But I'm also interested in broader life stories — the stories we tell ourselves, the stories we tell about others, the societal stories, the cultural stories that we may or may not even think of as stories but that influence how we think and how we act."

Dr. Litwin's passion for storytelling has carried over to his life as a physician and teacher. (In the summer of 2010, he attended the famed Iowa Writers' Workshop in order to polish a medical essay that was later published in *The New York Times* under the title "A Young Life Passes, and a Ritual of Birth Begins.") To this day, it's a passion he shares with students. "I love to be in a room with brand new students who don't know anything about medicine, but who hopefully know a little bit about human interaction," he says.

His principal joy comes in talking to them about the importance of narrative and writing and history. "You learn to take someone's raw, unvarnished story — his or her history, their grand mural with all its colors and textures and tensions,



if you will — and put it together in a way that captures their story and helps us to understand and process the information that is most important to what we're meant to do clinically to benefit the patient. That, too, is a part of our job," he says.

Dr. Schaberg, the UCLA humanities dean, summarized a further rationale for weaving humanities into medical education. "Humanities points to the human thing we demand but aren't quite getting from medical practice," he says. "It might be the ethics. It might be the caring touch. It might be the linguistic or cultural understanding that we're not getting. It might be any of these things. It's as if, by declaring medical humanities, we're saying there's a piece for more humanity in medicine that is still undefined."

Last year, when her appointment was announced, Dr. Arnold observed this hunger for something more first-hand. "I was, frankly, stunned by the outpouring of response from people who were genuinely excited about it," she says. Those who contacted her fell into two groups. "There were the people who wrote just to say, 'What a great role,' 'This is so exciting,' 'This is so needed.' And there were those who specifically asked, 'How can I become involved?' or who brought up aspects that weren't yet included in the curriculum but that they thought should be because this area of humanistic care is really broad."

She recognizes that the program is in its infancy, and "there is still so much we can do to continue to build and expand the curriculum." Ultimately, Dr. Arnold believes that students who engage in this work will grow to be physicians with "enhanced communications skills vital for patient-centered care, including an increased awareness of the diversity and manner by which people perceive and make meaning of their individual experiences of illness."

FINALLY, DR. BRADDOCK SEES MEDICAL HUMANITIES AS FAR MORE THAN "SOMETHING NICE TO ADD TO OUR DIDACTICS." In his vision, it is "central to preparing students for a career in medicine." While acknowledging that the fruits of the medical humanities theme and the broader curriculum within which it is embedded are still too new to be measured, "I can tell you that we're already seeing a profound impact," he says "Once we start talking to potential applicants about this different vision, we get a qualitatively different kind of applicant."

Further evidence? This past year's entering class had perhaps 20 students with an announced interest in bioethics, medical history, humanities and literature and medicine, including many who had already earned master's degrees, he says. Along with his cutting-edge ideas of what future graduates of the David Geffen School of Medicine might contribute to today's multicultural and interconnected world, Dr. Braddock also shares a specific goal with all applicants: "We want you to be an outstanding physician, and — the 'and' is what they fill in. It could be 'and scientist'; it could be 'and author'; or it could be 'and something entirely different.' Mainly, we consider that it is important for them to believe they have the ability to be something in addition to a physician taking care of patients over the course of their career."

Whatever that "and" is, Dr. Braddock's sights are aimed high for the future healers who pass through the doors of the David Geffen School of Medicine. "We want the young women and men we train to be the kind of physicians who are going to transcend the traditional role of taking care of patients," he says. "We want for them to be physicians who influence health and who impact the human condition — to be the voices of medicine in the world." ●

Dr. Claire Panosian Dunavan is a UCLA infectious-diseases specialist and a medical writer who earned a degree in humanities before deciding on a career in medicine. Her writing has been published in the Los Angeles Times, The New York Times, The Washington Post, Discover magazine and Scientific American, among others.



THE PSYCHEDELIC Rx

By Dan Gordon
Illustrations by John Jay Cabuay

It's been a long, strange trip for researchers at UCLA and other University of California campuses who are among a growing corps of scientists working to demonstrate the promise of hallucinogens to treat a variety of mental-health issues.

For more than three decades, Charles Grob, MD, has engaged in research that is guaranteed to make him a hit at cocktail parties, if not always among gatherings of traditional funders of scientific studies.

“This was always an obscure, niche area,” Dr. Grob says of his scientific explorations of the therapeutic value of psilocybin, an active chemical in magic mushrooms; MDMA, the party drug better known as ecstasy or molly; and ayahuasca, the Amazonian plant hallucinogen employed as a religious sacrament by indigenous cultures for centuries. “For the most part, the field consisted of myself and a few friends. What we’re seeing now is astonishing.”

Dr. Grob, director of child and adolescent psychiatry at Harbor-UCLA Medical Center and a member of the Jane and Terry Semel Institute for Neuroscience and Human Behavior at UCLA, is referring to the growing embrace of drugs long associated with the counterculture, and which are, for the most part, still illegal outside of tightly controlled research settings. Interest in studying psychedelics for mood disorders, addictions and other difficult-to-treat conditions has soared in recent years amid tantalizing hints of their transformative capabilities, particularly when combined with psychotherapy.

How to Change Your Mind, the best-seller published in 2018 by UC Berkeley journalism professor Michael Pollan about the new science of psychedelics, thrust the issue into the public sphere. Seemingly every week, another mainstream news outlet covers the practice — thus far unsupported by science — of “microdosing” psychedelic drugs. More than half-a-dozen cities, including Oakland and Santa Cruz in California, have decriminalized plant psychedelics, and in November 2020, voters in Oregon passed a ballot initiative making it the first state to legalize psilocybin and regulate its use by adults. The National Institutes of Health has joined for-profit and philanthropic enterprises in beginning

to fund studies of psychedelic treatments. And some of the world’s most prestigious universities have launched research programs — several University of California campuses among them, including UCLA, where the Semel Institute’s UCLA Psychedelic Studies Initiative will bring to bear the expertise of faculty from across the campus.

In the immortal words of the Grateful Dead: What a long, strange trip it’s been.

“Astonishing” could also apply to the evidence — albeit early — of the benefits of high-dose psychedelics, particularly psilocybin and MDMA, in the treatment of conditions that include depression, obsessive-compulsive disorder, alcohol abuse, smoking addiction and eating disorders. MDMA-assisted psychotherapy for the treatment of severe post-traumatic-stress disorder is on the verge of becoming the first psychedelic treatment to win approval of the U.S. Food & Drug Administration (FDA). That milestone comes on the heels of a Phase 3 clinical trial run by the nonprofit Multidisciplinary Association for Psychedelic Studies, which found that with three MDMA-assisted therapy sessions, 67% of patients no longer met criteria for a PTSD diagnosis and 33% showed complete remission. For the placebo group, the findings were 32% and 5%, respectively. The US-based nonprofit Usona Institute has an ongoing Phase 2 trial assessing the efficacy of psilocybin in the treatment of major depressive disorder. Similarly, the UK-based biotech company COMPASS Pathways expects to begin a Phase 3 trial for its psilocybin-assisted psychotherapy for treatment-resistant depression.

Dr. Grob’s work, which has contributed seminal findings that demonstrate significant improvement in mood and quality of life among patients with advanced-stage medical illnesses



Dr. Walter S. Dunn (left) and Dr. Thomas B. Strouse.

following psychedelic treatment, underpins much of this current research. “For many patients, these drugs appear to function as existential medicine, facilitating a renewed sense of purpose and meaning,” he says. “Individuals come out less fearful of death, less isolated and withdrawn, and they are more engaged with family and friends.”

Building on those conclusions, Dr. Grob and his colleagues at Harbor-UCLA and the UCLA Semel Institute are now collaborating with researchers at UC San Francisco on a multisite clinical trial using the psilocybin-treatment model — which augments the “trip” with psychotherapy by specially trained professionals before, during and after — for people with end-stage illnesses who are experiencing severe demoralization.

NEARLY ONE-IN-FIVE ADULTS IN THE UNITED STATES — approximately 53 million people — live with a mental illness, a public-health crisis that is compounded by the COVID-19 pandemic. While existing medications and psychotherapy help many, an estimated one-third of patients are considered treatment-resistant, and another third experience improvement but not complete remission. Even when effective, psychotherapy and medication work slowly, and the drugs have sometimes debilitating side effects. And when it comes to development of new medications, the process is painfully sluggish. The last major development in psychopharmacology was the introduction of selective serotonin reuptake inhibitors (SSRIs) more than 30 years ago, in the 1980s and ’90s.

“We have serious chronic illnesses for which our treatments are imperfect,” says Thomas B. Strouse, MD (RES ’91), medical director of the Stewart and Lynda Resnick Neuropsychiatric Hospital at UCLA, who is spearheading the Psychedelic Studies Initiative. “And there is at least the suggestion that many of these [psychedelic] substances may be quite safe, with people getting lasting benefit from single episodes of treatment. If that’s true, that could be a big change.”

The buzz around psychedelics stems not just from the idea that they represent a new approach, but also from results of studies hinting at the potential for fast, dramatic and enduring improvements in patient populations that haven't fared well with conventional treatments. "What's intriguing is to hear testimonials from patients who talk about their lives being changed," says Walter S. Dunn, MD (RES '14), PhD, a UCLA psychiatrist and Semel Institute faculty member who has advised the FDA on psychiatric drugs. "They don't just say 'I got over my depression' or 'my PTSD is better.' It's, 'I'm seeing the world in a whole new light.' We don't have much long-term data in the literature, but we know that at six months or a year, people are sustaining their remission after one, two or three treatments, whereas with standard medications, patients have to continually take them to stay well."

"I SAW HOW MUCH THIS COULD TEACH US ABOUT THE BRAIN AND MENTAL ILLNESS, AND I DECIDED THIS WAS WHAT I WANTED TO DO."

Dr. Dunn and others in the field are quick to stress that more research is needed to understand both the benefits and the potential risks of utilizing psychedelics to treat mental disorders. "What's really exciting is that we're bringing modern clinical trials and other techniques to understand compounds that have been used by humans for thousands of years," says Joshua D. Woolley, MD, PhD, who directs the Translational Psychedelic Research Program at UC San Francisco and has worked on a number of clinical trials of psychedelic treatments. "The studies look very promising in that you can get big changes in many conditions, but we still have a lot to learn."

Among the most fundamental questions is why psychedelics would be so effective in so many patients across a wide swath of psychiatric conditions. The working hypothesis involves the ability of psychoactive compounds to recapture the brain's state of neuroplasticity, inviting new connections and ways of thinking to emerge. When assisted by a skilled psychotherapist, the theory goes, these changes in the brain's chemistry enable people with mood or substance-use disorders to break free from negative thought loops — known in the mental-health fields as rumination.

"These medications seem to allow people to change habits or patterns of behavior that aren't easily changed," Dr. Woolley says. "If that's true, it has profound implications, because many psychiatric illnesses involve people getting stuck in a way of thinking or dealing with feelings. We know talk therapy is effective for many things, but it's slow, and it's not easy. If you could reopen a critical learning period and then augment the psychedelic treatment with talk therapy, that could have a big impact."

Mark Geyer, PhD, is another UC researcher with long experience working in this field; he co-founded the Psychedelics and Health Research Initiative at UC San Diego to study the potential of psilocybin and related compounds in treating pain and promoting healing. Dr. Geyer likens psychedelic therapy to a "rebooting"

The Promise and the Peril



Dr. Ziva Cooper.

EMERGING FROM AN EXTENDED PERIOD during which there was little or no research on the use of psychedelic drugs for psychiatric treatment, investigators face many more questions than they have answers. But recent studies suggesting that psilocybin ("magic mushrooms"), MDMA (Ecstasy or Molly) and other long-stigmatized substances may have therapeutic value for a wide range of mental-health conditions have prompted a number of major universities to establish programs to probe further, buoyed by the growing interest of funders and the loosening of government restrictions. The new UCLA Psychedelic Studies Initiative marks a major escalation in UCLA's contribution to these efforts.

"This initiative taps into the incredible depth and breadth of scientific and clinical expertise

across the UCLA campus," says Thomas B. Strouse, MD (RES '91), vice chair for clinical affairs in the Department of Psychiatry and Biobehavioral Sciences and a leader in the effort to establish the initiative. "Bringing in faculty who will work in a coordinated way across disciplines, with shared support resources, will accelerate research in this promising area of medicine."

In addition to delving into the potential benefits and risks of psychedelic-assisted therapies through clinical trials and other studies, the initiative will tackle the legal and social implications of the evolving landscape. Researchers also will study the basic neurobiology of psychedelics to glean insights on the workings of the brain. "These compounds can help us learn a great deal," says Charles Grob, MD, a UCLA Semel Institute

psychiatrist and pioneer in the field. Dr. Grob notes, for example, that preclinical laboratory studies with LSD helped to identify the location in the brain of receptors for serotonin, a neurotransmitter that elevates mood. That finding provided the target for selective serotonin reuptake inhibitors (SSRIs), the most commonly prescribed class of antidepressants.

The serotonin studies were led by Dr. Daniel X. Freedman, one of the early psychedelics researchers, in the 1950s. Dr. Freedman, who died in 1993, spent the last decade of his career on the UCLA faculty. Indeed, UCLA has a long history in the field of psychedelic studies. Along with Dr. Grob, some of the earliest research on clinical applications of psychedelics in the 1950s and 1960s was conducted by

UCLA psychiatrists, including Sidney Cohen, MD, and Louis Jolyon "Jolly" West, MD, the psychiatry department's longtime chair.

Studying psychedelic drugs is challenging, in part because of the gauntlet of regulatory hurdles stemming from their designation by the U.S. Drug Enforcement Administration (DEA) as Schedule I substances, defined as "drugs with no currently accepted medical use and a high potential for abuse." The UCLA Semel Institute already has an infrastructure for navigating those issues in its Cannabis Research Initiative (CRI), which will serve as a model for the new initiative. (Cannabis is also classified as Schedule I.) Ziva Cooper, PhD, CRI's director, serves on the new initiative's executive leadership team, along with Dr. Strouse, Dr. Grob, and Ira Lesser, MD, vice chair of psychiatry and biobehavioral sciences and Semel Institute faculty member.

Dr. Cooper explains that, as with research involving cannabis, UCLA studies using psilocybin and other Schedule I psychedelics must meet separate requirements of the DEA, the U.S. Food and Drug Administration (FDA), the State of California and the campus' Institutional Review Board (IRB) on issues that range from the ethics, safety and scientific justification of the investigations to the storage of the materials. "Many people think that by classifying these substances as Schedule I, research in these chemicals is pretty much impossible. But the truth is the work can be done," Dr. Cooper says. "It just takes a great deal of time, patience and expertise that comes from years of training and mentorship to

understand the regulatory process. In the end, it should be a comfort that these regulatory bodies, specifically the FDA and IRB, are making sure there are safeguards to ensure that people aren't being put at risk."

Even with a regulatory system in place, Dr. Cooper adds, the studies are expensive. Recently, the National Institutes of Health (NIH) funded research on the therapeutic benefits of psilocybin for the first time, indicating a growing willingness on the part of the major government funding body to support such work. But, even if federal research dollars become more available, the grant process is highly competitive, typically requiring a track record of preliminary findings. Following the CRI's successful model, the new initiative will at first rely largely on philanthropic support to bring in talented researchers and fund promising studies that can pave the way for NIH funding, which would help make the initiative self-sustaining.

The legacy of the long period of research dormancy is that there is much to learn about how psychedelics work, for whom they work and under what conditions they work, as well as who can safely use the substances and for which populations the risks outweigh the benefits. But, for all of the challenges and unanswered questions, there is also considerable excitement. "When you look at the durability of the effects in individuals who are treatment-resistant, it's absolutely worthy of further study," says Walter S. Dunn, MD (RES '14), PhD, a Semel Institute faculty member who is part of the initiative. "There is good data to show that these psychedelic treatments can change people's lives."

— Dan Gordon

“I WAS STRUCK EARLY ON BY THE CAPACITY OF THESE SUBSTANCES, WHEN USED AS ADJUNCTS TO PSYCHOTHERAPY, TO ENHANCE HOW PEOPLE PERCEIVE MEANING IN THEIR LIVES AND IN THE EVENTS AROUND THEM.”

of the brain’s circuitry, resulting in a reprogramming of cognitive and emotional processes. “Someone asked me how a medication with such a short half-life could produce such a long effect,” Dr. Geyer says. “Well, look at PTSD. A singular event can have an enduring impact.”

For Dr. Grob, some of the most striking findings have been in patients with alcohol-use disorder. Treatments using psychedelics, first in the 1950s and 1960s, and more recently in research at New York University with psilocybin, have shown robust effects for a condition that is notoriously difficult to tame. “Even in the earlier studies, the researchers noted that the most-therapeutic outcomes were among patients who had what was described as a mystical-level experience — a psycho-spiritual epiphany that seemed to have catapulted them into a new sense of purpose and meaning to their lives,” Dr. Grob says. “It harkens back to what William James, the father of American psychology, said in the early 1900s: The best treatment for dipsomania is religiomania. He was talking about spontaneous religious experience — but when you’ve got a psychedelic treatment model, you can reliably predict that this will be part of it.”

BY THE TIME DR. GROB ENTERED COLLEGE, IN THE LATE 1960s, the consciousness-expanding properties of LSD and other psychedelics had become an article of faith in the growing counterculture movement, fueled by the works of authors such as Ken Kesey, Tom Wolfe and Aldous Huxley; musicians such as Jimi Hendrix and the Jefferson Airplane; and leading movement figures such as Harvard University psychologist Timothy Leary.

But it wasn’t until Dr. Grob was out of college, in the early 1970s, that he learned about research from the previous two decades suggesting a role for these substances in psychiatry. “I was working at a sleep-research laboratory, and one of the doctors had a library in his office of everything that had been written on psychedelics, including all the treatment studies up to that point,” Dr. Grob recalls. “I saw how much this could teach us about the brain and mental illness, and I decided this was what I wanted to do.”

He enrolled in medical school, only to find that psychedelics research had become verboten. “It was taboo,” Dr. Grob says. “Every month, I would go to the medical school library, look up in Index Medicus terms like hallucinogen, lysergic acid diethylamide [LSD],

psilocybin, whatever, and there was never anything new.”

The use of psychoactive plants for spiritual and physical healing purposes by indigenous cultures dates back centuries, but it was only in the 1950s and 1960s that Western medicine began taking interest. In the course of those two decades, more than 1,000 articles were published in the peer-reviewed literature, and tens of thousands of subjects participated in studies of the therapeutic value of LSD and psilocybin for conditions that included depression, anxiety and alcohol abuse. Among the LSD-clinic attendees were Hollywood luminaries as bright as actor Cary Grant, who reportedly said after his many experiences with the drug, “At last, I am close to happiness.”

But the counterculture’s love affair with psychedelics produced a backlash. By the early 1970s, the FDA had stopped approving studies and the substances were classified as Schedule I, defined as “drugs with no currently accepted medical use and a high potential for abuse.” Through the ’70s, ’80s and most of the ’90s, research on psychedelics as therapy was almost non-existent. Dr. Grob remembers psychiatry turning its back on the field, as well. As a second-year medical student, he chose to present to his class on a study in which patients with terminal cancer were treated with psychedelics to reduce their anxiety. “I was excited, wondering what questions my classmates and professors would ask,” he recalls. “Not a single hand went up. I got the sense I wasn’t supposed to talk about this.”

The field cracked open again, ever so slightly, in the 1990s, but activity remained limited until the early 2000s, when the tide began to turn with a Johns Hopkins University study of psilocybin in healthy volunteers, a study led by Dr. Grob at Harbor-UCLA on psilocybin treatment for patients with terminal cancer who had anxiety, a study at the University of Arizona using the drug for treatment-resistant OCD patients and the first research into MDMA as therapy for chronic PTSD.

With funding still hard to come by, a group of physicians and scientists with an interest in psychedelics research,

including Dr. Grob and UC San Diego’s Dr. Geyer, established the nonprofit Heffter Research Institute in 1993. The goal was to attract philanthropic funding for high-quality studies that would demonstrate therapeutic value sufficient to ignite a new era of government support. The institute served as both reviewer and financial backer of many of the pivotal clinical studies of psychedelic therapies that were published, beginning in 2011. “We would identify worthy projects and investigators, then go out and find donors who would fund them,” Dr. Geyer explains. “We also had a considerable influence on the quality of the work, because we had to rehabilitate psychedelic science after the backlash. We were told we needed to be holier than the Pope.”

Dr. Geyer’s research group was among a handful to continue receiving government funding for laboratory studies of the behavioral and neurobiological effects of psychedelics during the dormant period. He originally was drawn to the field after reading Huxley, intrigued by the notion of “doors of perception,” as the author described in his book by that name about his experience on mescaline in the early 1950s. Through much of his career, Dr. Geyer studied psychedelics to gain a better understanding of the workings of the brain. Now, in leading UC San Diego’s initiative, he is part of the first study investigating psilocybin’s potential in the treatment of phantom limb pain — pain perceived in the area where an arm or leg has been amputated — with plans to also examine psychedelic therapy for complex regional pain syndrome. “It’s amazing, even to those of us who have always thought there is legitimate reason for scientific scrutiny of these compounds, to see the cross-diagnostic clinical efficacy being found in preliminary data,” he says.

Brian Anderson, MD, MSc, became interested in the therapeutic potential of psychoactive compounds during the dark period for psychedelic research, and he remembers being surprised to learn that it was mostly anthropologists and botanists, rather than psychiatrists, seeking to understand the use in indigenous settings of substances that could



have such powerful effects on thoughts and emotions. After seeking counsel from Dr. Grob while an undergraduate, he pursued medical school and training in psychiatry, with an eye toward investigating psychedelic medicines as potential treatments.

“I was struck early on by the capacity of these substances, when used as adjuncts to psychotherapy, to enhance how people perceive meaning in their lives and in the events around them,” says Dr. Anderson, now a psychiatrist at UC San Francisco and an investigator with the recently established

UC Berkeley Center for the Science of Psychedelics.

As a postdoctoral scholar under the mentorship of Dr. Woolley at UC San Francisco from 2018 to 2019, Dr. Anderson conducted a pilot study of psilocybin-assisted group therapy for older, long-term AIDS-survivor men experiencing demoralization. Although the study was designed only to test the safety and feasibility of the therapy, the researchers observed clinically significant improvements. Dr. Anderson is now collaborating with Dr. Grob on the Harbor-UCLA study

(From left) Dr. Mark Geyer, Dr. Joshua Woolley and Dr. Brian Anderson.



of individuals with end-stage illnesses, which seeks to determine if psilocybin in combination with psychotherapy not only reduces depression and anxiety, but also enhances patients' sense of meaning. “Some of the best outcomes of clinical trials using psychedelic-assisted therapy have been among patients in an end-of-life palliative-care setting, where they're coping with finding new sources of meaning when old sources of understanding what's important in life have been shifted or challenged by their illness,” Dr. Anderson says.

AS THE MOMENTUM FOR INVESTIGATING THE THERAPEUTIC POSSIBILITIES OF PSYCHEDELICS builds, and researchers begin to make up for lost time, they face the reality that even when the funding is there, it's a tricky field of study. For one, the Schedule I designation of the drugs they are investigating raises regulatory hurdles, including the need to obtain a special license from the U.S. Drug Enforcement Administration to secure the substances. But beyond that, designing double-blind, randomized placebo-controlled trials — considered the gold standard in clinical research, wherein volunteers are arbitrarily assigned to receive either the experimental treatment or an inactive

substance, and neither the research subjects nor the researchers know who is in which group — can be thorny. “For the most part, people know if they're on a psychedelic drug as opposed to a placebo,” says Dr. Dunn, who is leading the West Los Angeles VA Medical Center site for multicenter trials of psilocybin-assisted psychotherapy for PTSD and smoking cessation.

Recruiting subjects for such studies hasn't been difficult — there is considerable interest in participating, Dr. Dunn notes. But that raises its own challenge: a phenomenon where functional unblinding and participant expectations collide. “People come in excited to be part of these studies and hoping to receive the psychedelic. If they realize they received placebo because it is obvious they didn't have the psychedelic experience, they're going to be disappointed, and their depression might worsen,” Dr. Dunn says.

The modern studies also represent a departure from traditional medication trials in that they typically combine the psychedelic with psychotherapy. In the current model, that means a substantial investment of resources — generally six-to-eight hours of therapy beforehand with two psychotherapists to prepare for the drug session; six-to-eight hours under the influence of the drug, guided by the therapists; and six-to-eight hours over the following weeks for subjects to discuss the psychedelic experience and how they might incorporate changes based on insights gained. Emphasis is placed on ensuring the subject has the right mindset and that the environment for the drug session is soothing — more living room than doctor's office, with comfortable couches, beanbag chairs, rugs, artwork and plants. The professionals who deliver the 20-or-so hours of therapy before, during and after the drug treatment undergo extensive training to learn how to work with patients experiencing intense and challenging memories and emotions, and how to harness those experiences therapeutically.

“Unlike most of psychiatry, in which talk therapy and psychopharmacology are related but separate, in this case

“INDIVIDUALS COME OUT LESS FEARFUL OF DEATH, LESS ISOLATED AND WITHDRAWN, AND THEY ARE MORE ENGAGED WITH FAMILY AND FRIENDS.”

they're combined," Dr. Woolley says. "In part, that's because if you're giving high-dose psychedelics to people with mental illness to take by themselves, without someone to help them process the experience, you can have bad outcomes. If you think about it, millions of people use psychedelics out in the world, and they're not all cured of their depression or substance-use disorder. We think it might require this combination of the psychedelic drug and the psychosocial intervention to have the best outcomes."

The drug ketamine may offer an instructive comparison. Though not a classic psychedelic, at high doses, ketamine can produce hallucinations, and it is believed to enhance neuroplasticity. Its antidepressant properties were discovered in the 2000s; it has been used off-label ever since, and in 2019, a ketamine-derived drug won FDA approval for treatment of drug-resistant depression. But ketamine has mostly been studied apart from psychotherapy, and while it produces a fast-acting, mood-elevating effect, that tends to wear off within days or weeks. "It's easy to argue that, in the case of the psychedelic-assisted psychotherapies, it's the therapy that's the driving force in terms of patients getting better,

with the psychedelics supercharging that process," Dr. Dunn says.

THE FORM IN WHICH PSYCHEDELIC THERAPY WILL BECOME LEGALLY AVAILABLE remains an open question. Most psychotropic drugs currently in use to treat conditions like depression, anxiety and psychosis can simply be picked up at a local pharmacy with a prescription and taken at home. If psychedelics, on the other hand, require the supervision of a trained psychotherapist when administered, along with the intensive preparation and integration before and after the experience, both the high cost and the limited supply of trained providers could limit the number of people able to receive the therapy. "There isn't a lot of know-how about these substances in the mental-health profession, and training people to work with them is going to take time," Dr. Anderson says.

That assumes that individuals won't go rogue and seek to medicate themselves with the drugs, either on their own or under the care of untrained therapists. "There's always been an underground," Dr. Grob says. "Some of these practitioners know what they're doing, others don't. I'm not a big fan of underground treatment." UC San

“THERE ISN'T A LOT OF KNOW-HOW ABOUT THESE SUBSTANCES IN THE MENTAL-HEALTH PROFESSION, AND TRAINING PEOPLE TO WORK WITH THEM IS GOING TO TAKE TIME.”



Diego's Dr. Geyer also worries that as word continues to spread about the promise of psychedelic therapy that is demonstrated in the studies, more people will take the drugs outside of medical supervision. "This is not something you should try at home," he says.

Yet, many already are. An increasingly popular use of psychedelics involves microdosing. The idea is to take a small enough amount every few days so as to capture the mental-health benefits without feeling the high — in essence, using the psychedelic like a standard antidepressant medication. But psychedelic-medicine researchers point out that microdosing hasn't been studied, so there is no data to suggest it works, or that it doesn't have adverse effects.

The classic psychedelic drugs aren't addictive, and there is little risk of lethal overdose. Used as they are being currently studied, with one or two supervised doses, they may, in fact, prove to be safer than less-potent drugs prescribed for long-term daily use, Dr. Geyer notes. Concerns about the drugs are more psychological. The clinical studies have mostly excluded individuals with schizophrenia or bipolar disorder, along with those with a first-degree relative with one of the conditions; the risk level for these populations will require further study. Outside of the setting of a clinical trial, people have, in rare cases, likened their negative psychedelic experiences to PTSD, or they have reported that the experience brought on existential crises.

FOR MUCH OF DR. GROB'S CAREER, OBTAINING FINANCING FOR HIS PSYCHEDELIC STUDIES was nearly impossible. "We would have to scrape by with minimal funds. I'd have to work pro bono," he says.

That's changed in a big way, but now Drs. Grob and Geyer, who co-founded the Heffter Institute to help drum up support for the research, worry about the rapid growth of for-profit companies entering the field. They are concerned that an emphasis on maximizing returns on investments will lower safety standards.

Indeed, at a time when the momentum is on the side of decriminalizing psychedelics and once again exploring their therapeutic use, some want to seize the moment and press on the gas pedal, while those who remember how the first wave of interest ended are more likely to urge restraint. "This field was shut down for decades because of the excesses in the culture," Dr. Grob says. "Now we have a remarkable window of opportunity, and we have to be cautious about opening things up too quickly. We need more research to demonstrate the utility of these drugs under optimal conditions, and to spell out what those conditions are." ●

Dan Gordon is a freelance writer and frequent contributor to U Magazine.

For more information about the UCLA Psychedelic Studies Initiative, go to: psychedelic.semel.ucla.edu



"Antique fountain pens first captured my attention because of the variety of interesting designs," says Dr. Otto O. Yang.

Pen Pal

By Veronique de Turenne

IF OTTO O. YANG, MD, IS WEARING A BUT-TON-DOWN SHIRT, it's a good bet that there will be an antique fountain pen clipped in his breast pocket. If so, it likely will be one of the more than 300 that he has collected and restored over the course of 30 years. For a researcher and clinician who examines the world at the cellular level, a love for such old-fashioned writing implements may seem incongruous. But with its form, function and history, the vintage fountain pen reflects a bygone era to which Dr. Yang has been drawn since childhood.

"Ever since I was a kid, I've been intrigued by things that are very old," he says. "I started out in collecting just like a lot of kids do, with stamps

and coins and things like that. As I got older, my interest in antiques just grew from there."

It is an interest that transports him ages away from his day job as a professor of medicine and associate chief of the Division of Infectious Diseases. Over the past two years of the COVID-19 pandemic, the foundation that he laid with his more than two decades of research at UCLA on immune therapies and vaccines against HIV, as well as other viral infections and diseases, has made him a go-to expert on the new coronavirus; since the pandemic was first declared in March 2020, his name has appeared in news stories more than 5,000 times.

What would become his passion for antique pens began during his medical training when, as a resident at Bellevue Hospital in New York City in 1991, Dr. Yang was browsing a stall in one of the area's large flea markets and an unusual object caught his eye. Shaped like a small barrel, with a removable cap and a curving triangular tip, it was an antique fountain pen. He purchased it, and the beginning of his remarkable collection was born.

"Antique fountain pens first captured my attention because of the variety of interesting designs, but then I came to appreciate the function as well," he says. "Early pens, even the fairly inexpensive ones, far outperform many modern

fountain pens, which are so expensive and have become status symbols now."

As his interest in antique pens grew, Dr. Yang narrowed his focus to pens produced from their earliest years to the start of the 20th century. This was an era during which no fewer than 50 different companies were producing pens, almost all of them American, including still-familiar names like Waterman and Parker, but also now-forgotten ones like Conklin. Dr. Yang's pens range from simple hard-rubber cylinders designed to carry as much ink as possible to elegant Art Nouveau gems encased in twining designs of chased silver.

"These are from very early in the 1900s, when there was a brief period during which pens were highly decorated, almost like jewelry," he says, showing off a few examples. "You would invest in a fountain pen, and it would be like a wristwatch, something you would keep for years and years. A company in New York brought in craftsmen from Europe who briefly produced ornate hand-made silver- and gold-covered pens for wealthy buyers, but within a few years decorative metal overlays were mass produced. Starting in the '20s, when plastics became available, the emphasis switched more to colorful designs, and while I do have a few of those, to me they're not as interesting."

Among Dr. Yang's finest finds is the so-called Parker "Snake" pen, a slim, tapered shape wrapped with a green-eyed snake made of silver. Another favorite is the Waterman "Tree Trunk" pen. Also wrapped in silver, the design is reminiscent of

the whorls and knots of a tree. "No one knows why it exists," Dr. Yang says, with a laugh. "But it's an iconic pen — there were only a couple dozen known to exist — and it's a mystery what the design is supposed to be and who commissioned it."

Although the fountain pen is a niche writing implement today, its invention at the end of the 19th century was nothing short of revolutionary. For the first time in history, writers were liberated from the tyranny of the stationary inkwell. Efforts to invent a pen with a portable reservoir of ink trace back to the ancient Egyptians. Leonardo Da Vinci left behind drawings of a fountain pen prototype. A string of inventors tried their hand throughout the 18th and 19th centuries, but it wasn't until Lewis Waterman came along with a patented design, in 1884, that resolved some key issues that had hindered development, such as equalizing the pressure inside the closed reservoir while allowing the ink to flow out, that the modern fountain pen was born.

Not just an object of function and form, the fountain pen also has been the subject of some academic exploration. In 2017, a graduate student at Auburn University, Charles Busby, wrote his master's thesis — by hand, using several of the elegant writing instruments — entitled, "The Forgotten Fountain Pen: The Historical Significance of the Fountain Pen in Twentieth-Century American Society." "It was Waterman's patent that made production of the fountain pen possible," says Busby, who today is an archivist at the Alabama Department of Archives and History. "Once Waterman

solved the problems of ink and air flow, fountain pens become extremely popular because they were both easy to use and easy to manufacture."

While popular, fountain pens were far from inexpensive. The better pens sold for \$10, which in the early 1900s was equal to a week's salary. The convenience of ballpoint pens, which went into wide production in the mid-1940s, was a death knell for fountain pens. However, their demise was only temporary. A resurgence of interest began in the 1980s, and Busby says he's not surprised. "Fountain pens satisfy a desire for authenticity, for distinction," he says. "Using a fountain pen is the exact opposite of flickering screens and digital communication like Facebook, which is one of the reasons they have an enduring value and an enduring legacy, even today."

After three decades of collecting, studying, repairing and refurbishing antique fountain pens, Dr. Yang is firmly entrenched in that legacy. With his eclectic collection mostly complete, he now finds pleasure in helping and guiding new enthusiasts. "I've been collecting for a long time, so there are very few examples that interest me that I don't already have," he says. "In terms of collecting, it's more that I'm looking to be surprised. The joy for me now is when I see or learn something new. And it's also interacting with new collectors, sharing knowledge and enjoying and sharing in their enthusiasm." ●

Veronique de Turenne is a freelance writer in Los Angeles.

AWARDS & HONORS

Dr. Aparna Bhaduri, assistant professor of biological chemistry, received the 2022 Sloan Research Fellowship.

Dr. Enrico G. Castillo (FEL '17), associate director of residency education at the Jane and Terry Semel Institute for Neuroscience and Human Behavior at UCLA, received the American Psychiatric Association's Irma Bland, MD Award for Excellence in Teaching Residents.

Dr. Lindsay De Biase, assistant professor of physiology, received an inaugural McKnight Brain Research Foundation Innovator Award in Cognitive Aging and Memory Loss.

Dr. David P. Eisenman (FEL '02), professor-in-residence of medicine at the David Geffen School of Medicine at UCLA and director of the UCLA Center for Public Health and Disasters at the UCLA Fielding School of Public Health, was named to the standing committee for the CDC Center for Preparedness and Response.

Dr. Gregg C. Fonarow (MD '87, RES '90, FEL '93), Eliot Corday Chair in Cardiovascular Medicine and Science, received the Gold Heart Award from the American Heart Association.

Dr. Patricia A. Ganz (MD '73, RES '76, FEL '78), director of the Center for Cancer Prevention and Control Research in the Jonsson Comprehensive Cancer Center, was named a Fellow of the American Association for Cancer Research Academy.

Dr. Tomas Ganz (MD '78, FEL '81, '83), Distinguished Professor of Pathology and Laboratory Medicine, received the Gold Medal of Charles University of Prague.

Dr. Carol M. Mangione, Barbara A. Levey, MD, & Gerald S. Levey, MD Professor of Medicine and Public Health and chief of the Division of General Internal Medicine and Health Services Research, was named chair of the U.S. Preventive Services Task Force.

Dr. Folasade P. May (FEL '15), director of the Melvin and Bren Simon Gastroenterology Quality Improvement Program, received the Distinguished Service Award in Diversity, Equity and Inclusion from the American Gastroenterological Association.

Dr. May Nour (RES '13, FEL '14, '15), medical director of the UCLA Arline & Henry Gluck Mobile Stroke Rescue Program, received the 2022 Stroke Care in Emergency Medicine Award from the American Stroke Association.

Dr. Kymora B. Scotland, assistant professor of urology, was named the 2022 American Urological Association Western Section's Young Urologist of the Year.

Dr. Tisha Wang (RES '05, FEL '08), clinical chief of the UCLA Division of Pulmonary/Critical Care Medicine, received the 2022 California Thoracic Society's Woman of the Year Award.

In Memoriam

Dr. Mark De Antonio (FEL v'87), clinical professor of psychiatry at the Jane and Terry Semel Institute for Neuroscience and Human Behavior at UCLA, died December 31, 2021. He was 67 years old. Dr. De Antonio served as director of the inpatient child and adolescent psychiatric service at the Stewart and Lynda Resnick Neuropsychiatric Hospital at UCLA. He was known for his passion to care for severely mentally ill and vulnerable youths.

Dr. John Edmond, professor emeritus of biological chemistry, died February 18, 2022. He was 85 years old. Dr. Edmond's research included basic infant nutrition and nutrient requirements for brain development, and whether or not secondhand smoke and air pollution contribute to hearing loss in infants.

Mann Gift Lays Groundwork for Scientific Advancement

By Robin Keats



Alfred E Mann.

ALFRED E MANN WAS A VISIONARY WHOSE groundbreaking work in the field of medical technology led to such accomplishments as the pacemaker, insulin pump, a retinal prosthesis and other highly advanced prosthetics. His vision extended to those scientists who would follow him, and he made sure the fortune he amassed from his inventiveness and entrepreneurship would continue to benefit others. In 2010, six years before his death at the age of 90, Mann established the Alfred E Mann Family Foundation. Mike Dreyer, president of the foundation, explained it was created specifically so that Mann's philanthropy would continue in perpetuity.

In 2022, the Alfred E Mann Family Foundation made a \$5 million gift to UCLA, evenly divided to establish the Alfred E Mann Family Foundation Research Acceleration Fund at the Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research at UCLA and the Alfred E Mann Family Foundation Technology Development Fund at the California NanoSystems Institute (CNSI) at UCLA. The

stem-cell center and the CNSI will use the funds to invest in groundbreaking research and develop novel tools and technologies that will yield new insights into human biology and bring lifesaving treatments to patients with serious illnesses.

When Mann, who earned his bachelor's degree in physics at UCLA, began his first philanthropic enterprise, in 1985, he composed a pledge letter:

"I have been very fortunate in having been born to exceptional parents in this great country. I came from humble beginnings and grew to become a young scientist pioneering in a field of electro-optical physics. The United States Army needed my help, and actually set me up in business in 1956. Two years later, the Air Force came to me for help with our country's first spacecraft. The success of my first company has enabled me to leapfrog from one success to another, enabling me to amass a substantial fortune. I want to use those resources to make this a better world — and to do as much as I can during my lifetime. I am therefore committing most of my estate to philanthropy, primarily focusing on development of medical products to improve and extend lives."

During his lifetime, Mann founded and helped to fund 17 companies. All were formed to execute his ideas that sprung from the nexus of medicine and engineering. Following creators Warren Buffett, Melinda French Gates and Bill Gates, he became a member of The Giving Pledge.

In addition to being a brilliant scientist, inventor and entrepreneur, Mann also was a humanist. Dreyer recounted how, during a gala some 20 years ago, Mann asked a veteran of the war in Iraq who had lost his arms in a bombing to come to the podium. With his brain-controlled prosthetic arms, hands and fingers — technology developed by one of Mann's foundations — the soldier deftly grasped a tomato, cut it into slices and neatly put them into a cellophane bag. "It was an example of engineering perfection," Dreyer said. "I can remember how proud Al felt, how personally moved he was when his gift of restored dexterity was put to such precise use by someone previously so disabled."

In a *Los Angeles Times* article from 1998, Mann said: "When my success exceeded my expectations, I began to think of a way to return to society what it has given to me." He focused much of his career on issues dealing with hearing, sight, paralysis and the loss of limbs. The seriousness of his work did not obscure his self-deprecating humor. "Al joked that he 'helped make the blind see, the deaf hear and the lame walk,'" Dreyer said. "And then he added, 'Remember what happened to the last guy who did these things?'"

The Alfred E Mann Family Foundation gift comes as the stem-cell center marks 15 years since it was renamed in honor of Eli and Edythe Broad. Through the generosity of The Eli and Edythe Broad Foundation, UCLA was able to purchase specialized high-tech laboratory equipment, support faculty recruitment and continue its leadership role in pursuing innovative research concepts to unlock the potential of regenerative medicine, which provides

"I can remember how proud Al felt, how personally moved he was when his gift of restored dexterity was put to such precise use by someone previously so disabled."

enormous opportunities to harness the body's inherent ability to heal.

At the same time, the CNSI is celebrating 22 years since its establishment to keep California at the forefront of technology through academic research and partnerships with the private sector. Today, the CNSI is a campus hub of multidisciplinary research, education and entrepreneurship. The institute helps develop leading-edge technologies that encourage collaboration among interdisciplinary teams of UCLA investigators, while also administering educational programs that train the next generation of academic leaders. Additionally, the CNSI's start-up incubator, Magnify, helps scientists commercialize discoveries and launch new companies that generate jobs and work to address societal challenges in health, energy and the environment.

Freedom to explore novel research avenues is vital to advancing science, and those who helm the Alfred E Mann Family Foundation allowed investigators at the stem-cell center and the CNSI to determine for themselves how the philanthropic investment should be spent.

"Truly groundbreaking research that can alter the course of human health often begins with bold, unconventional ideas," said Dr. Thomas Rando, director of the stem-cell center. "Our scientists have proven that a profound investment in research at discovery and preclinical stages can yield tremendous results. Moreover, private philanthropy has seeded and accelerated innovative research leading to Phase I clinical trials."

At CNSI, the Alfred E Mann Family Foundation Technology Development Fund will give UCLA scientists the opportunity to create new tools and technologies, as well as the resources to pursue studies focused on accelerating the development of biomedical devices and therapeutics that address grand challenges in health care.

"New tools often drive scientific discoveries with high impact," said Dr. Jeff F. Miller, director of the CNSI. "Continuous investment in technological advancement is crucial for UCLA's research enterprise and only possible with philanthropic partnerships. The Alfred E Mann Family Foundation's gift will enable UCLA's scientists to create pioneering tools with new capabilities to probe questions that would otherwise be unapproachable. The research fund supported by the Alfred E Mann Family Foundation will give our investigators a competitive edge and help keep UCLA as a global leader in biomedical research."

The foundation points to the spirit of collaboration it recognizes within UCLA as its reason for giving now to UCLA. "We did not have a strong relationship with UCLA prior to these gifts, but we know why UCLA is held in such high regard," Dreyer said. "We know that UCLA has extraordinary men and women who can help to further realize Al's vision of solving challenges in medicine."



PHOTO: ELENA ZHUKOVA

As the stem-cell center and the CNSI look to the future, the foundation's gift will advance their missions to produce significant discoveries and new technologies that will revolutionize the treatment of disease. In recognition of the gift, UCLA will name a portion of the third floor of the Terasaki Life Sciences Building, home to the UCLA Broad Stem Cell Research Center, the Alfred E Mann Family Foundation Foyer, and the auditorium on the first floor of the CNSI building will be renamed the Alfred E Mann Family Foundation Auditorium.

The foundation noted it looks toward a day when stem-cell therapies become more viable, widely available and economically feasible. "We think that gifts such as ours will propel scientists involved in achieving such things," Dreyer said. The foundation also considers the dual \$2.5 million gifts as a beginning. "We'll monitor how the funds are used, and we hope to be able to continue our funding," Dreyer said. ●

Robin Keats is a freelance writer in Los Angeles.

For more information about the Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research at UCLA, contact Sabrina Ayala at: 310-206-3815

For more information about the California NanoSystems Institute at UCLA, contact Jordan Kovacev at: 310-825-2648

Attanasio Family Gift To Benefit UCLA Geriatric Medicine



Debbie and Mark Attanasio.

MILWAUKEE BREWERS PRINCIPAL OWNER MARK ATTANASIO AND HIS WIFE, DEBBIE, made a \$1 million commitment to support the new Innovation in Geriatric Medicine Fund at the David Geffen School of Medicine at UCLA. Under the direction of Dr. Brandon Koretz (RES '99, FEL '00), co-chief of the UCLA Division of Geriatrics and James and Carol Collins Chair in Geriatric Medicine, the fund will provide unrestricted resources for early-stage research, physician training and education and clinical programs.

According to Mark Attanasio, the family contributed to UCLA out of gratitude for the care UCLA Health has provided for his family, particularly his

mother. Dr. Eric Esrailian (FEL '06), chief of the UCLA Vatche and Tamar Manoukian Division of Digestive Diseases and The Lincy Foundation Chair in Clinical Gastroenterology in the David Geffen School of Medicine at UCLA, is an enthusiastic advocate of the geriatrics program and told the family about the fund. Upon learning about the new Innovation in Geriatric Medicine Fund, the family was eager to support Dr. Koretz's vision for fostering health care innovation and resiliency research.

"Our family sees the Innovation in Geriatric Medicine Fund as an opportunity to make both an immediate and long-term difference in responding to the growing need for high-quality geriatric care," Attanasio

said. "We strongly believe our society must elevate the elderly and value their wisdom and love. They should be cherished and not forgotten."

The seed funding provided by the gift will advance the work of geriatricians and support research that will help them gain a better understanding of aging and develop interventions that promote healthful aging. Current research underway at UCLA that may benefit from this funding includes studies of the links between social and biological factors that determine a person's health, and how these shape health outcomes, aging and the life course; how economic and social development interact with genetics and epigenetics; and how long-term social trends shape population and health. Other areas cover mitochondrial-DNA-deletion mutations that may be predictors of physical performance in older adults.

Supporting pioneering research is a vital part of UCLA's efforts to retain outstanding faculty members and advance knowledge in the field, which in turn will help prepare physicians across the country to care for a growing elderly population. By 2030, about 70 million Americans — approximately 20% of the population — will be 65 years of age or older, which could seriously strain the nation's health care system.

"The Innovation in Geriatric Medicine Fund will advance a variety of

efforts to improve the health of older adults, from accelerating fundamental research and developing new diagnostics and therapeutics to building a pipeline of future geriatrician-scientists," Dr. Koretz said. "By supporting these efforts, this generous gift from the Attanasio family will help UCLA improve care and quality of life for older adults in Los Angeles and around the world."

Attanasio is the co-founder and managing partner of Los Angeles-based Crescent Capital Group, LP. In addition to health care initiatives, he and Debbie Attanasio are actively involved in numerous philanthropies focused on underprivileged youths, high school and higher education, the arts and Jewish and Catholic communities.

They have instilled similar philanthropic values in their children. For example, their son, Mike, joined with several professional athletes to launch California Strong, which raises funds for those in need following natural disasters and other tragic events. The organization contributed to UCLA Health's response to the COVID-19 pandemic by donating funds, distributing grants and, with the Wahlburgers restaurant chain, organizing hospital meal deliveries. ●

For more information, contact Nora McCarl at: 310-210-5795

\$10 Million Gift Advances Ocular-Genetics Research



PHOTO: COURTESY OF DR. BRONWYN BATEMAN

Dr. Bronwyn Bateman.

UCLA HAS RECEIVED A \$10 MILLION COMMITMENT from Dr. Bronwyn Bateman (RES '78, FEL '79), a former professor of ophthalmology and pediatrics at the David Geffen School of Medicine at UCLA, to establish a center for ocular genetics at UCLA Stein Eye Institute. The gift will provide funding for center startup costs and an endowment to support an endowed chair, future research projects and the greatest needs of the center, as determined by the center director.

"As a long-standing partner of Stein Eye, Bronwyn has helped advance many of our vision programs," said Dr. Bartly Mondino, director of the Stein Eye Institute and Bradley R. Straatsma, MD Endowed Chair in Ophthalmology. "We are grateful for this contribution, which will help position UCLA at the forefront of ocular-genetics research and accelerate interdisciplinary science, innovative medicine and new technologies to benefit patients worldwide."

Many genetic disorders affect the eyes and can be complex. Ocular genetics, a priority area for the Stein Eye Institute and the David Geffen School of Medicine at UCLA, addresses the genetic component of ophthalmic disease and includes

studies to understand the patterns and risks of inheritance, accurate diagnosis and prognosis and the development of therapies to treat genetic abnormalities. The center, to be named the UCLA Bronwyn Bateman Center for Ocular Genetics in honor of Dr. Bateman's gift, will advance the clinical and translational science in this area of ophthalmology.

"As one of the first major centers of its kind in the United States, the UCLA Bronwyn Bateman Center for Ocular Genetics will be a basis for growth and will make a significant impact," Dr. Mondino said.

"It is an honor to support the genetics program for the UCLA Stein Eye Institute, a leader in ophthalmology," Dr. Bateman said. "Genetics is the future of medicine, and this center will support the current ophthalmology-genetics faculty and provide resources for growth."

As a young resident at the Stein Eye Institute in the 1970s, Dr. Bateman faced tragedy when her husband, Rory Smith, who was then a resident in orthopaedics at UCLA, was diagnosed with mesothelioma, an asbestos-related cancer. He died after an 11-month battle with the disease; Dr. Bateman said her Stein Eye colleagues provided a great sense of community for her during that very difficult time.

She also credits Drs. Mondino and Straatsma, the founding director of the Stein Eye Institute, with providing professional opportunities that proved pivotal in her career. Her previous contributions to the Institute include a gift to create an endowed faculty chair in her late husband's name to create a legacy he could not build for himself.

"I had the pleasure of being an internal medicine resident in 1974, and my first husband, Rory, and I recognized the institutional integrity at UCLA," Dr. Bateman said. "I also am indebted to Dr. Straatsma and Dr. Mondino for their personal and professional support."

Dr. Bateman became board-certified in both ophthalmology and medical genetics/clinical genetics,

and during her time as a faculty member at UCLA, she became the first woman to serve as president of the Association of University Professors of Ophthalmology, the organization for ophthalmology departments in the United States and Canada, and the president of the Pan-American Association of Ophthalmology. Dr. Bateman is currently president of the UCLA Ophthalmology Alumni Association.

This visionary gift will provide a remarkable legacy for Dr. Bateman, as well as immense resources to advance research in ocular genetics, while positioning UCLA at the forefront of research in this area. Through collaborations across the UCLA campus, the new center will leverage the study of ocular genetics and precision medicine, accelerating interdisciplinary science, innovative medicine and new technologies.

"It is an honor to support the genetics program for the UCLA Stein Eye Institute."

In addition, it will complement UCLA Stein Eye Institute's introduction, in 2021, of a medical-genetics track in its Specialty Training and Advanced Research Program, which offers residency training in ophthalmology in tandem with training by the UCLA Intercampus Medical Genetics Training Program, leading to certification in clinical genetics and genomics by the American Board of Medical Genetics and Genomics. Dr. Bateman's contribution also supports Stein Eye's overall goals of preserving and restoring vision by preventing and treating eye disease, eradicating preventable blindness and training the next generation of exceptional vision specialists. ●

For more information, contact Joy Kruger at: 310-825-3381

Legacy Gift Will Support Resident Internists and Diversity



Ethel Toki.

AFTER ETHEL N. TOKI MOVED FROM HAWAII TO LOS ANGELES in 1954, she was working at a bank when a friend told her about UCLA, describing the campus as a wonderful place to work. She was intrigued and applied for a job, ultimately starting her 20-year career in the university's administration office, where she worked as a senior systems analyst for the vice chancellor in the Graduate Division.

Toki's other connection to the university is as a UCLA Health patient. As such, she has been impressed by the medical care she received from her internist, Dr. Robert Oye (RES '83). "I believe internists are often underappreciated for all that they do," Toki said. "They are really the gatekeepers of what happens to patients, making sure they get the right testing and care. I know they do not receive large stipends during their residency, and other residents in specialties such as oncology or surgery will have a greater earning potential. So,

as I was organizing my estate, I thought a little additional stipend would help these doctors and let them concentrate on their work instead of worrying about whether or not they have enough money for the rest of the month."

Toki took steps to leave a share of her estate to UCLA to establish an endowment that will generate support for resident internists, who will be known as Ethel N. Toki Fellows. In addition, as part of her legacy, she also wanted a classroom in the David Geffen School of Medicine at UCLA to be named after her.

"When I was working at UCLA many years ago, I would walk around campus and notice the names on buildings," she said. "Reflecting back on that, I thought it would be important to have my Japanese American name on a classroom to represent the diversity of the campus."

"They are really the gatekeepers of what happens to patients, making sure they get the right testing and care."

Diversity is an issue close to Toki's heart and life story. "I am Japanese American," Toki said. "When I was growing up in Hawaii, ethnicity mattered. My father was incredibly committed to his community and worked very hard to give back. He assisted individuals with a variety of matters, including taxes, immigration and notary public work, among other things. He was a role model to me, and I was inspired to emulate him and give back to my community here, in California," she said. "I decided to name a classroom to inspire people of different ethnic groups to have a presence and representation in their communities while remaining connected to their roots." ●

For more information, contact Emily McLaughlin at: 310-794-4763

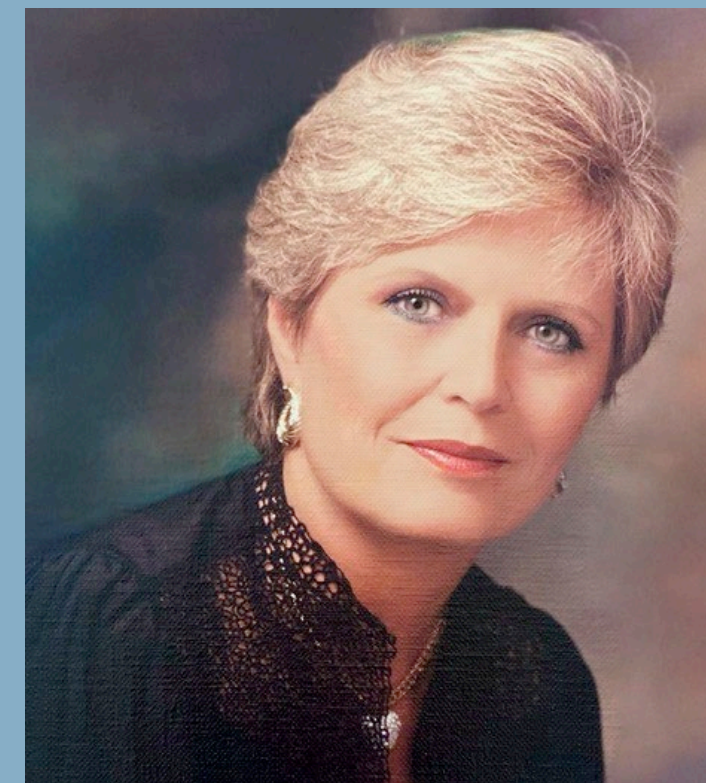
A Responsibility to Effect Positive Change

Just as diversity is an issue close to Ethel Toki's heart, so it is at the David Geffen School of Medicine at UCLA. With a belief that health care is a human right, the school is educating the next generation of physicians, physician-scientists and researchers with that belief in mind. The core values of justice, equity and diversity inclusion are inseparable from its institutional goals of excellence in all areas of health care, research, education and community engagement. To further these efforts, the David Geffen School of Medicine has created the Anti-racism Roadmap

"With a belief that health care is a human right, the school is educating the next generation of physicians, physician-scientists and researchers with that belief in mind."

as a path to ensuring racial justice, equity, diversity and inclusion. This roadmap represents a commitment to actively dismantle structural racism and is the first step in the school's planning, development and implementation process. The roadmap outlines priorities, strategies and actions across all areas that will be co-created over the years in close collaboration with the David Geffen School of Medicine Faculty Equity and Diversity Inclusion Committee, the school's Staff Racial Justice Task Force and the entire David Geffen School of Medicine at UCLA community of trainees, staff and faculty. ●

IN MEMORIAM



Lena Longo.

Lena Longo, a longtime friend of the Center for Cerebral Palsy (CCP) at UCLA | Orthopaedic Institute for Children, died on July 26, 2021. She was 90 years old. Born in Port Colborne, Ontario, Canada, Longo was a devoted mother, lifelong learner and distinguished philanthropist. She worked numerous jobs as a child during the Great Depression and World War II, including on farms and in factories, experiences she valued throughout her life. She attended St. Joseph's School of Nursing in Toronto, married and settled in Welland, Ontario, as a working mother and full-time nurse. She and her husband, Dominic,

moved the family to California in the 1950s, and Longo worked as a nurse at St. Vincent's Hospital and helped her husband found Longo Toyota. After one of their daughters was diagnosed with severe cerebral palsy, they did what they could to advance research in this field and began contributing to the UCLA center in 2004, later establishing the Lena Longo Endowment for Cerebral Palsy Research to help accelerate discovery at the CCP. "Once you meet someone with cerebral palsy, they automatically have your heart," said Longo about her giving. She is survived by five of her six children, 10 grandchildren and many nieces and nephews. ●

HONORING A MENTOR



Dr. Nanette DeBruhl.

Dr. Nanette DeBruhl has contributed \$250,000 in memory of her colleague, friend and mentor Dr. Lawrence W. Bassett (RES '74). The late Dr. Bassett, who passed away in December 2020, joined the UCLA faculty in 1974 and held the Iris Cantor Endowed Chair in Breast Imaging until his retirement in 2016. A professor of radiological sciences, beloved by his colleagues and patients, Dr. Bassett, who helped launch the careers of UCLA residents and fellows, was considered one of the fathers of breast imaging, and he played an important role in its gaining recognition as a subspecialty. He was internationally known for his role in the development of national guidelines to ensure high-quality mammography through the Mammography Quality Standards Act. Of all his accomplishments, he was most proud of the UCLA Breast Imaging Fellowship, which he established in 1987. This gift will transform the waiting area for patients of the Iris Cantor Breast Imaging Center and name it The Bassett Lounge in his honor. ●

For more information, contact Gemma Badini at: 310-206-9235

RACING FOR A CURE TO END ALZHEIMER'S DISEASE

Philip Frengs, a 1973 UCLA alum, has contributed more than \$150,000 to benefit the UCLA Alzheimer's and Dementia Care Program (ADC) in the UCLA Division of Geriatrics. In 2013, his wife, Mimi, also a UCLA alum, began to

show some signs of cognitive decline. "We consulted with her physician and a local neurologist and ran a battery of tests, including an intensive study at UCLA. At only 60 years of age, Mimi had been stricken with early-onset Alzheimer's," Frengs said. In 2016, as Mimi's needs increased, Frengs, president and CEO of Legistics, Inc., engaged in-home caregivers to help his wife stay in their home. That same year, while on a track where the Legistics racing team was competing for an International Motor Sports Association championship, he realized that companies like his regularly cover these race cars with company names, logos and brands. It struck him that the car could instead be covered with the names of loved ones who are



Philip Frengs (left), with one of his race cars, presents Dr. David Reuben (FEL '88), chief of the UCLA Division of Geriatrics, director of the UCLA ADC program and Archstone Foundation Endowed Chair in Geriatrics, with a check to support the ADC.

suffering from Alzheimer's, or who may have passed away because of dementia to raise awareness and funding to fight the disease. After winning that championship, Frengs established the Racing to End Alzheimer's Foundation. Since then, Racing to End Alzheimer's, with its distinctive purple livery, competes in a car covered from bumper to bumper with names. In April 2022, Frengs hosted a pro-am golf tournament in Palos Verdes. Adding golf to racing, he hopes to double his impact to benefit the UCLA ADC program. ●

For more information, contact Nora McCarl at: 310-210-5795

HONORING THE MEMORY OF A LOVED ONE

The Trena and Stanley Greitzer Family Foundation has made a \$500,000 gift to honor the memory



(From left) Ron Greitzer; Trena Greitzer; Dr. Alexandra Drakaki (on video); Dr. Mark S. Litwin (FEL '93), chair of the UCLA Department of Urology and The Fran and Ray Stark Foundation Chair in Urology; and Dr. Karim Chamie.

of husband, father and grandfather Stanley Greitzer, who passed away in the summer of 2021. Trena Greitzer and the couple's children and their spouses, Ron and Carolyn Greitzer and Bonnie and Jonathan Barg, wanted to make a meaningful gift to honor Stanley, who was receiving care at UCLA. This funding will benefit the cancer research of Drs. Karim Chamie (FEL '12) and Alexandra Drakaki in the UCLA Department of Urology. The family has a long-standing connection to UCLA — Trena met Stanley at UCLA 63 years ago and both are UCLA alumni, as are their daughter, Bonnie, and daughter-in-law, Carolyn. Trena Greitzer, who gives her time to numerous organizations, understands the importance of philanthropy and building awareness about various causes. "The care team at UCLA has been incredible, and our family is forever grateful for the compassionate care given to Stan and our family," she said. "It has been very healing and meaningful for our family to support research with this gift honoring Stanley and the doctors who cared for him." ●

For more information, contact Gretchen McGarry at: 310-794-4746

ADVANCING BRAIN-CANCER RESEARCH

The Sheila and Stanford L. Kurland Family Foundation has made a \$2.5 million pledge in honor of Dr. Timothy Cloughesy (RES '91, FEL '92), director of the UCLA Neuro-Oncology Program, for brain-cancer research. Their gift will fund studies to discover innovative drug candidates being led by Drs.



Stanford and Sheila Kurland.

Cloughesy and David Nathanson (PhD '11, FEL '13), associate professor in the Department of Molecular and Medical Pharmacology. The late Stanford Kurland was founder of PennyMac Financial Services, Inc. and PennyMac Mortgage Investment Trust, and he was president and chief operating officer at Countrywide Financial Corp. In recognition of this gift, the lobby of the Bowyer Oncology Center in the Peter Morton Medical Building will be named the Stanford L. Kurland Lobby. In June, PennyMac will present the Stanford L. Kurland Memorial Golf Classic in his memory to raise funds to benefit brain-cancer research. ●

For more information, contact Elizabeth Naito at: 310-206-6749

REMOTE FUNDRAISING CAMPAIGN BENEFITS UCLA MATTEL CHILDREN'S HOSPITAL

The fundraising committee for Party on the Pier wrapped up its Party On! "nonevent" fundraising campaign in December 2021, raising \$526,000 for UCLA Mattel Children's Hospital. In 2020, the hospital's signature fundraising event, Party on the Pier, held on the Santa Monica Pier, went virtual due to COVID-19. In lieu of Party on the Pier, Party On! was born, and the dedicated Party on the Pier fundraising committee focused on a remote campaign to raise vital dollars to support the hospitalized children and their families served by UCLA Mattel Children's Hospital.

Proceeds raised from this event support a wide variety of children's health initiatives, hospital programs, innovative research and discoveries that are improving children's lives. ●

For more information, contact Danielle Dietz at: 310-267-4098

PROMOTING WELL-BEING IN BODY AND SOUL

UCLA Health's Sound Body Sound Mind and Operation Mend have received a \$200,000 commitment from **Deanne and Steve Moore** to support both programs over the next four years. Sound Body Sound Mind provides middle and high schools with a comprehensive physical education program, including state-of-the-art fitness centers. The Moore's gift will enable the program to continue ensuring that thousands of students across Greater Los Angeles will have access to its full array of health and wellness resources. It also will allow the program to provide essential equipment repairs and replacement. The couple's contribution also will benefit Operation Mend, which provides post-9/11 military personnel with plastic and reconstructive surgery, along with comprehensive mental-health care. It will assist Operation Mend in developing new programs, as well as in expanding its Intensive Treatment Program, which offers individualized treatment to service members suffering from post-traumatic stress disorder and traumatic brain injury, along with support for their families. ●

For more information, contact Nicholas Middlesworth at: 310-206-2089

A DEDICATION TO PHILANTHROPY

The Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research at UCLA has received a \$300,000 gift from **Dr. Mark Terasaki** in memory of his father, Dr. Paul Terasaki. This gift will provide crucial funding to support and increase access to the center's microscopy core, which

offers state-of-the-art imaging technologies for the in-depth analysis of cells and tissues. As a professor in the Department of Cell Biology at UConn Health, Dr. Terasaki's work involves the use of microscopy, and he understands the benefits of the technology to move research forward. Dr. Terasaki, who received his BS from UCLA in 1975, has previously supported the Immunology, Inflammation, Infection and Transplantation Research Theme in the David Geffen School of Medicine at UCLA. His philanthropy follows in the footsteps of his father, a UCLA alumnus and former UCLA professor of surgery, and his mother, Hisako, an artist and printmaker, who have given transformative gifts to UCLA. "To honor my father's legacy, I am happy to contribute to the infrastructure that supports promising research at UCLA," Dr. Terasaki said. ●

For more information, contact Sabrina Ayala at: 310-206-3815

CONTINUING TO HEAL THE WOUNDS OF WAR

In fall 2021, **Wounded Warrior Project (WWP)** awarded UCLA Health Operation Mend four grants totaling nearly \$12 million dollars over the next two years. The grants will establish two new programs: Approximately \$6.2 million will fund a traumatic-brain-injury intensive-treatment program and \$895,000 will establish a substance-use disorder/post-traumatic stress disorder intensive-treatment program. Additional funds include nearly \$4 million to support the life-changing surgical and physical-injuries program and more than \$800,000 for capital improvements that will enable the team to take care of more warriors and improve treatments. "Thanks to the support of WWP, we are going to be able to do so much more great work for our warriors and their families," said Dr. Jo Sornborger, executive director of Operation Mend. ●

For more information, contact Nicholas Middlesworth at: 310-206-2089

A Book Changed My Life

By D'Juan Farmer, PhD



PHOTO: BRIAN VAN DER BRUG/LOS ANGELES TIMES VIA GETTY IMAGES

I WAS 12 OR 13 YEARS OLD WHEN I PICKED UP THE BOOK *DEATH BE NOT PROUD*. One of my older brothers brought it home from high school to read for a class, but I don't think he ever did, and it was left lying around the house.

I was an avid reader, so I'd grab pretty much any book that was within my reach. I had no idea what this one was about — the dust jacket gave little clue, other than to say it was "A Memoir" — but from its first pages, this account by John Gunther of the death of his brave and spirited teenage son, Johnny, from a brain tumor had me in its spell.

Even at that young age, I'd already read some pretty weighty books, primarily African American literature. There were heavy, difficult themes in those books. I didn't know what to expect from this one. It was heavy, to be sure; "death" is right there in the title. But it also was something else

— hopeful. I was riveted by how relentless Johnny's parents were in their pursuit of different strategies to battle his disease, and by the determination of his doctors to go down every conceivable road that was available in the late 1940s to try to save him. And I felt a close kinship with Johnny. He was 16 years old — just a few years older than me — when he was diagnosed, and through the course of the book, he endured a roller coaster of ups and downs, experiencing progress and setbacks. Yet, he didn't ever lose hope, and he remained, to the end, courageously optimistic.

I was particularly struck by his deep gratitude for the people who worked so hard to help him. There is

one particular line from the book that stands out, a note scribbled across the top of the last letter that Johnny wrote to his mother, Frances, before he died, at the age of 17: "Scientists will save us all." There is no bitterness or irony in

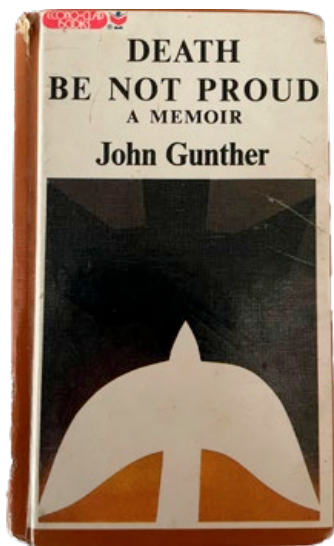


PHOTO: COURTESY OF DR. D'JUAN FARMER

those words; rather, they are an affirmation of his persistent faith that, even though it would not save him, science one day *will* save others.

It was inspiring to read. At the same time, members of my family were going through serious health issues of their own, and the intersection of Johnny's journey and the realization that disease can strike people so close to home motivated me further.

And, so, I decided I would be a scientist. I didn't really know at that time exactly what it was that a scientist does, but I did know what doctors do, and so I told anyone who would listen that I wanted to be an oncologist, because that was the kind of doctors I read about in the book.

Ultimately, however, it was not so much the idea of becoming a clinician who heals others that captured my imagination; what captivated me was the idea of discovering new ways to heal.

Discovery, then, would be my path.

I GREW UP IN COMPTON, CALIFORNIA, a community not known for sending a large percentage of its young people to college, and I attended local schools until high school. I was a good student, and many of my teachers took notice of my interest in math and science, and they became mentors to me. The caring and support shown to me by those strong, Black women helped me to earn admission to a highly competitive magnet high school, and then to UCLA (where I was one of just 96 Black students in my freshman class of some 4,300, but that is a story for another day). I am the middle son among five, and the first person in my family to go to college. It makes me proud that my two younger brothers have followed my example to pursue college degrees.

It has been a rigorous journey, with stops along the way at the National Institutes of Health, UC San Francisco and USC. I have come full circle, back to UCLA, where I conduct research to more fully understand a birth defect called craniosynostosis. It is a condition that causes premature fusion of the sutures — the fibrous joints that connect the bony plates of a baby's skull — and inhibits proper brain growth. While not life-threatening, it is life-altering, and I hope that our work will not only increase understanding of why the condition occurs but also someday contribute to better treatments.

As I settle into my new lab and begin to pursue my research at UCLA, I think back on the mentors who helped me to get here, and



PHOTO: SERGIO BIANCO/USC STEM CELL

As a UCLA freshman in 2006 (left), Dr. D'Juan Farmer was one of only 96 Black students in a class of some 4,300. After earning his PhD from UC San Francisco, he did a post-doc in stem-cell studies at USC (above).

I recognize that now I, too, have a role to play to help other young scientists find their paths. Mentorship, particularly of underrepresented students in the sciences, is incredibly powerful and can be among the most formative experiences anyone can have.

With that as my North Star, my dream is to do my part to uphold Johnny's expression of faith — "Scientists will save us all" — by not only conducting my own research to, in whatever way I can, defeat illness and death, but also by committing myself to support and guide the next generation of scientists who will make the important discoveries of the future.

That is my dream. It began 20 years ago when I picked up a book. ●

Dr. D'Juan Farmer is assistant professor of molecular, cell and developmental biology and a researcher with the Department of Orthopaedic Surgery in the David Geffen School of Medicine at UCLA. He received his BA from UCLA in 2010, followed by a post-baccalaureate fellowship at the National Institutes of Health. Dr. Farmer earned his PhD at UC San Francisco, was the inaugural Choi Family Postdoctoral Fellow in stem-cell studies at USC and is recipient of the Howard Hughes Medical Institute Hanna H. Gray Fellowship.