



PANDEMIC

COVID-19 has changed everything.



A publication of
UCLA Health and
David Geffen School of Medicine at UCLA

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Photo: Ann Johansson

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Confronting COVID-19.

BY JOHNESE SPISSO, MPA

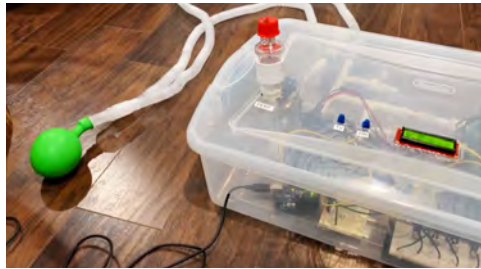


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Editor's Note

This is not the issue of *U Magazine* that we had planned. The publication was going into production when the COVID-19 pandemic hit. While it was not possible to completely tear up the issue and start over and still keep to some semblance of a schedule, we did tap the brakes, pulling out some stories and replacing them with newly written content that is relevant for what we are going through at this time. One of the changes you may notice in this issue is that we have suspended our practice of original photography that requires direct contact with subjects. Social distancing now is the norm, and everyone involved in the production of *U Magazine* is doing their utmost to complete the issue while working from home. But that is the world in which we live, at least for now.

Stay well and stay safe.

Dave Greenwald

Share Your Thoughts with Us

Your input is important, so please give us your comments and feedback. Include your name, E-mail 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.



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Photo: UCLA Health

Resilience

As health care workers confront COVID-19, it will be the combined strength and support of our UCLA Health family and of our community that enables us to get through this.

As COVID-19 spread across the country, the physicians, nurses and staff of UCLA Health have been on the frontline of a crisis that is like nothing we have seen before.

But the mission of UCLA Health demands that we be here every day, 24 hours a day, to support and deliver care to our patients. That mission revolves around a concept we call CICARE, which is the foundation of our vision to alleviate suffering and deliver acts of kindness. While this has been an extremely difficult time — one that has created both personal and professional stress — it has been so gratifying to see how everyone has coalesced around these core values, which have inspired all of us to work in health care and to treat everyone — patients, families and each other — with compassion, dignity, understanding, patience and kindness.



The COVID-19 pandemic has been an unprecedented situation for health care providers nationwide. But this is not the first time we have faced an epidemic. We have been challenged in the past by outbreaks of measles, tuberculosis, SARS and MERS. Even if no patient with these diseases sets foot in our hospitals or clinics, we prepare for and learn from each of these events. We build on the

knowledge that we gain from each event to bolster our response for the next one, accumulating increased understanding of what we need to do to prepare.

Safety for our patients and staff continues, as always, to be our foremost priority. Since the first days of this outbreak, our infectious-diseases specialists have been on high alert, monitoring the situation and regularly communicating with regional and federal agencies to coordinate our response as events evolve. Our Emerging Infectious Disease Program

and the members of our highly trained infectious-diseases team work with our physicians and staff to educate everyone about necessary safety precautions, including the use of PPE (personal protective equipment), and the proper care of patients coming to us with symptoms of COVID-19. They also work to ensure that there are appropriate supplies of medical equipment and protective gear and that proper cleaning and disinfection protocols are followed.

Managing a crisis such as this truly is a team effort. From the onset, we have come together to collaborate across our health system to develop a robust hospital surge plan to meet the anticipated needs of large numbers of patients coming to us for care. Our goal has been to maximize all our physical spaces within our contiguous licensed facilities at our Ronald Reagan UCLA campus and our Santa Monica UCLA campus. If fully implemented, our multilevel surge plan would bring our total capacity to more than 1,100 beds for inpatient care. Staffing for many critical areas has been planned to assure resources consistent with the hospital surge plan. Well before the anticipated crest of this wave, we placed orders for such vital equipment as additional respirators, gurneys, IV poles and infusion pumps. And our clinical microbiology lab worked rapidly to expand its capacity and bring COVID-19 testing in-house. You can read an interview about those efforts in the Conversation section of this issue (“Litmus Test,” pg. 12).

As our teams of dedicated health care professionals and support staff pull together, it also is gratifying to see how our broader community has come together to support us. The messages of support that we have received have bolstered our spirits. Whether expressions of encouragement come from videos by LA Lakers stars like LeBron James, Kyle Kuzma and Danny Green or from messages Tweeted by civic leaders like Los Angeles County Supervisor Sheila Kuehl or from someone standing six feet away in a grocery line who thanks one of our team members for their service, they bring some light into what feels to many like a dark time.



LeBron James.
Image: Courtesy of LeBron James

As the songwriter Leonard Cohen said: “There is a crack in everything; that’s how the light gets in.”

That light has been shed, as well, by direct support that has helped to provide the resources necessary to continue to safely engage with patients and protect our staff. Several companies and institutions came forward to donate critically needed PPE such as N95 and surgical masks. Others made significant financial gifts to help meet our needs for

PPE and ventilators and research. Organizations have been created to coordinate restaurants to provide meals for our frontline caregivers. Across our university campus, teams came together to address and solve urgent needs. These are wonderful examples of generosity and caring at this critical time. You can read more about this in the Friends section of this issue (“Philanthropic Giving Aids UCLA Clinicians Combating COVID-19,” pg. 44).

In a time like this, I am reminded of how proud I am of all the wonderful people we have working at every level who are touching the lives of our patients. We now are in the midst of the International Year of the Nurse and Midwife, which honors the 200th anniversary of the birth of Florence Nightingale, and as we salute our nurses, it also is appropriate at this challenging time to include all health care workers in our thoughts and good wishes.

The people of UCLA Health are a family. The community that supports us is a part of that family. Our strength is in our caring for one another in a time such as this. That is what makes us resilient and will ensure that we all will come out of this experience stronger.

Handwritten signature of Johnese Spisso.

Johnese Spisso, MPA
President, UCLA Health
CEO, UCLA Hospital System
Associate Vice Chancellor, UCLA Health Sciences

Low-cost Ventilator Prototype Could Provide Support in COVID-19 Pandemic

It took a UCLA Biodesign Fellow one week to build a working, low-cost ventilator prototype from parts purchased at Home Depot. If additional development with medical-grade materials, further testing and clinical studies yield positive results, the device could have the potential to provide much-needed support in treating patients during the COVID-19 pandemic.

Mechanical ventilators in today's hospitals are highly sophisticated, powerful devices capable of adapting to the varying needs of patients with a wide range of pulmonary disorders, including chronic obstructive pulmonary disease and amyotrophic lateral sclerosis. These full-featured ventilators are complex and expensive, costing from \$30,000 to \$50,000 and requiring dedicated software to administer high concentrations of oxygen to assist patients in respiratory distress.

But treatment of COVID-19 does not require that level of sophistication, and the new prototype — a sort of “ventilator-lite” — might provide the essential lifesaving functions at a fraction of the price. Glen Meyerowitz, a graduate student in electrical and computer engineering at the UCLA Samueli School of Engineering, watched with alarm as news reports and medical professionals predicted a severe shortage of ventilators needed to treat the projected surge in COVID-19 patients. He looked at research coming out of Seattle, China and other disease hot spots around the world; reviewed widely accepted treatment protocols; and consulted with clinicians from around the U.S. — including several from the David Geffen School of Medicine at UCLA — to determine the exact functionalities needed in a device.

His review of clinical research and discussion with more than a dozen medical professionals confirmed that COVID-19 patients often need treatment for acute respiratory distress syndrome (ARDS), which

has a much narrower treatment regimen than that needed by many patients typically seen in an ICU. He set out to design a smaller, simpler device capable of providing the standard level of care for ARDS — the ARDSnet protocol — but without the extra features and price tag of a standard machine.

Early tests were encouraging, and Meyerowitz has been in contact with several design and manufacturing firms to begin medical-grade production of the devices for testing at the UCLA Simulation Center in preparation for an institutional review board study at UCLA Health. “Direct collaboration with UCLA Health’s clinical community is key to identifying and optimizing the specific features needed for this unique clinical challenge,” Meyerowitz says, adding that the team is working with the UCLA Department of Anesthesiology to best replicate the conditions that clinicians are facing.

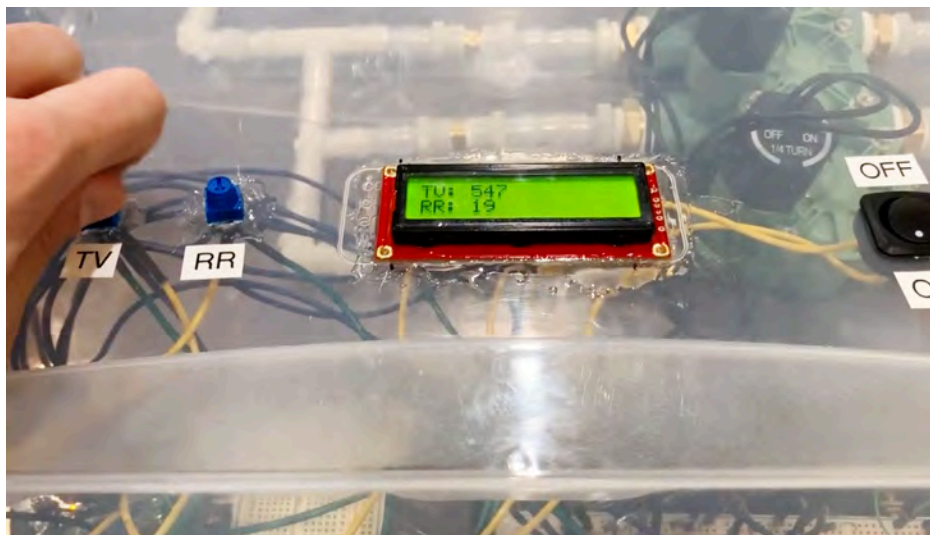
Meyerowitz’s work was supported by UCLA Health’s UCLA Biodesign Fellowship. “In the COVID-19 crisis, Glen saw a possible opportunity to transform the practice of medicine and individual patient lives in an immediate and profound way,” says Desert Horse-Grant, senior executive director of UCLA Health Research and Innovation and co-executive director of UCLA Biodesign. “This low-cost ventilator prototype is an excellent example of how interdisciplinary teams at UCLA Health are collaborating to find medical solutions,” adds Jennifer McCaney, co-executive director of UCLA Biodesign.

Although Meyerowitz and the team are not yet able to predict the final price tag, they expect the ventilators might be mass produced in the \$1,000 range per unit.

— Sandy Van



To view a video about development of the low-cost ventilator prototype, go to: tinyurl.com/ventilator-prototype



Using parts purchased from Home Depot, UCLA electrical and computer engineering graduate student and BioDesign Fellow Glen Meyerowitz built a prototype for a low-cost ventilator (top) that potentially could be employed in a hospital setting. He has gone on to refine his design (bottom left and right) and test it at the David Geffen School of Medicine at UCLA Simulation Center, using an artificial lung connected to the ventilator to determine the device's performance.

Photos: Glen Meyerowitz

Blood-donor “Angels” Save a Child’s Life

Her words hung in the hushed air. “Thank you for saving our boy,” the mother said, her voice choked with emotion. Devra Schwartz and her husband Jeff recently had a chance to express their gratitude to eight

of the 100 strangers whose blood donations provided a lifeline for their son Judah, now 4 years old. The Santa Monica youngster nearly died last year when his kidneys failed due to foodborne *E. coli* infection.



Blood donors who saved the life of Judah Schwartz (from left) April Yamamoto, Naomi Mimila, Lars Schumacher, Samantha Calzadillas, Emma Stackpole, Vilma Curiel and Shannon Viola with Judah, Devra, Levi and Jeff Schwartz.

Photo: Reed Hutchinson

Toxins in the *E. coli* bacteria ruptured Judah's red blood cells, leading to massive blood loss. His platelets — critical to clotting and preventing hemorrhage — plummeted to 13,000. A healthy person's platelet count is between 250,000 and 450,000.

Judah underwent 47 transfusions in 21 days, his 37-pound body hooked to a dozen machines in the pediatric ICU at UCLA Mattel Children's Hospital.

"At Judah's first transfusion, we were terrified and hopeful," Jeff Schwartz recalled during an event in January organized by the UCLA Blood & Platelet Center to recognize its top blood donors. "We sat by his bed and prayed that platelets would be the answer to his recovery."

When his kidneys shut down, Judah required 24-hour dialysis to clean his blood. Seizures and small strokes wreaked havoc in his brain. To lessen stress on his body and support his breathing, UCLA doctors placed Judah on a ventilator and induced a medical coma.

"We were not confident that Judah's story would have a positive resolution," Patricia Weng, MD, Judah's pediatric nephrologist and an assistant professor of pediatrics, told the audience. "Without you, his recovery could not have happened."

UCLA collaborated with Loyola Marymount University (LMU), where Devra and Jeff Schwartz work in campus security and instructional technology, respectively, to quickly organize a blood drive on the LMU campus. There was a huge outpouring of community support, and within 30 days the organizers collected all of the O-positive blood, platelets and plasma that Judah needed to survive.

"You feel like someone's hero without even intending to," Naomi Mimila, one of Judah's blood donors, told KNBC-TV. "It's so rewarding, especially when you get news like this."

Fellow donor Anthony Bejjani, MD, a hematology/oncology fellow at the David Geffen School of Medicine at UCLA, agreed. "I just assume that my blood will go to someone who really needs it. But it's nice to actually put a face to it."

UCLA shared Judah's story as the nation struggles with a severe blood shortage. The blood center's stock of type-O blood — which can be transfused into anyone, regardless of blood type — has dropped to half its normal inventory. "We hope that people can be inspired by Judah's story and donate," said Devra Schwartz, her eyes brimming with tears. "You are our angels. From the bottom of our hearts and souls, thank you."

— Elaine Schmidt



To view a video about Judah Schwartz and the blood donation that saved his life, go to: tinyurl.com/Judah-Schwartz



For information about blood and platelet donations and to make an appointment at the UCLA Blood & Platelet Center, go to: uclahealth.org/gotblood



Top: Judah Schwartz and older brother Levi share a moment of comfort during Judah's hospitalization. **Bottom:** "Thank you for saving our boy," Devra Schwartz told blood donors who saved the life of her son Judah (center right), with husband Jeff and older son Levi.

Photos: UCLA Health

Blood Test Identifies Risk of Disease Linked to Stroke and Dementia

Levels of six proteins in the blood can be used to gauge a person's risk for cerebral small vessel disease (CSVD), a brain disease affecting an estimated 11 million older adults in the United States, a UCLA-led study has found. CSVD can lead to dementia and stroke, but currently it can be diagnosed only with an MRI scan of the brain.

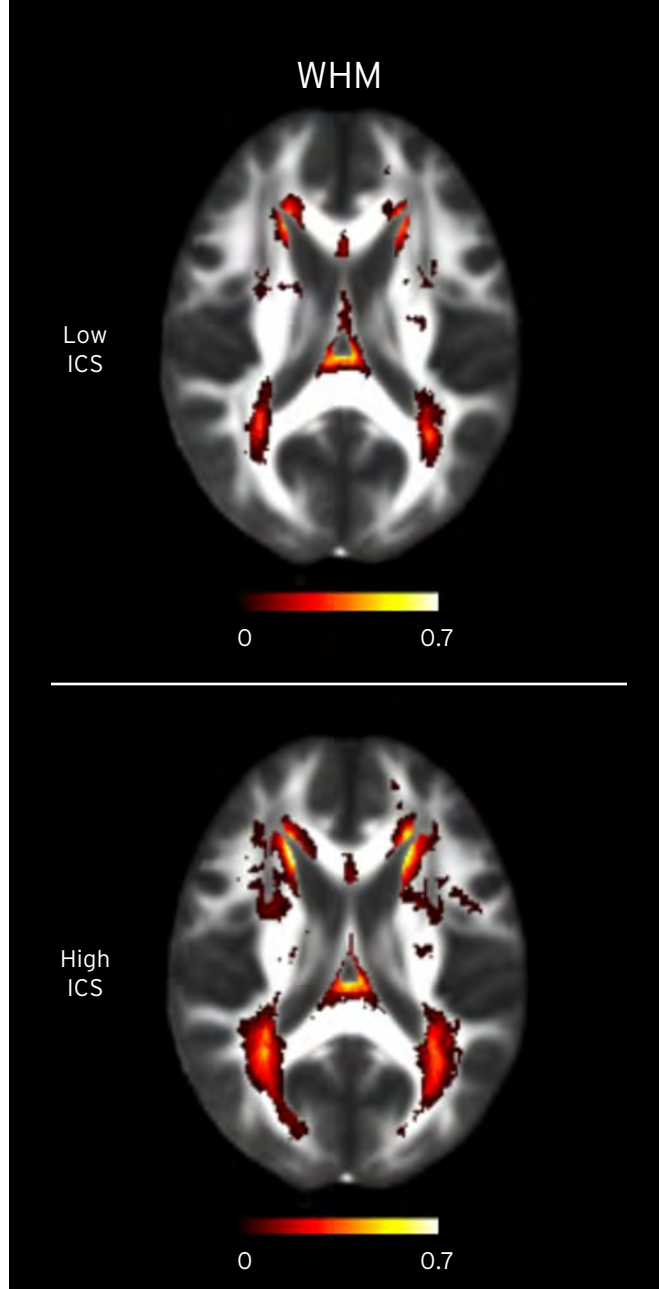
“The hope is that this will spawn a novel diagnostic test that clinicians can start to use as a quantitative measure of brain health in people who are at risk of developing cerebral small vessel disease,” says Jason Hinman, MD (RES '11, FEL '13), PhD, assistant professor of neurology.

CSVD is characterized by changes to the brain's white matter — the areas of the brain that have a high concentration of myelin, a fatty tissue that insulates and protects the long extensions of brain cells. In CSVD, small blood vessels that snake through the white matter become damaged over time, and the myelin begins to break down. This slows the communication between cells in the brain and can lead to problems with cognition and difficulty walking. If the blood vessels become completely blocked, it can cause a stroke. The disease also is associated with a heightened risk for multiple forms of dementia, including Alzheimer's disease.

Typically, doctors diagnose CSVD with an MRI after a person has experienced dementia or suffered a stroke. About a quarter of all strokes in the U.S. are associated with CSVD. But many cases of the disease go undiagnosed because of mild symptoms, such as trouble with walking or memory, that can often be attributed to normal aging.

In the new study, Dr. Hinman and colleagues focused on six proteins related to the immune system's inflammatory response and centered on a molecule called interleukin-18 (IL-18). They hypothesized that inflammatory proteins that damage the brain in CSVD may be detectable in the bloodstream. The researchers measured the levels of the proteins in the blood of 167 people whose average age was 76 and who had either normal cognition or mild cognitive impairment. As part of their voluntary participation in the study, 110 participants also underwent an MRI brain scan, and 49 received a more advanced scan called diffusion tensor imaging.

People whose MRI or diffusion tensor imaging tests showed signs of CSVD had significantly higher levels of the six blood proteins, the researchers discovered. Those with higher-than-average levels of the six inflammatory proteins were twice as likely to have signs of CSVD on an MRI scan and 10% more likely to show very early signs of white matter damage. Moreover, for every CSVD risk factor that a person



MRI scans show the average measurable difference in white-matter brain damage in people with low inflammatory-blood-test scores (below median) and those with high scores (above median).

Image: Courtesy of Dr. Jason Hinman

had — such as high blood pressure, diabetes or a previous stroke — the inflammatory protein levels in their blood were twice as high, on average.

To confirm the results, the team performed the blood test in a group with a much higher risk for CSVD: 131 people who visited a UCLA Health emergency department with signs of stroke. Once again, the blood test results were correlated with white matter changes in the brain that were detected by an MRI.

The blood test is a step forward, Dr. Hinman says, because it could provide a quantitative scale for evaluating the disease. That means it could be used to follow the progression of the disease or to identify people who are candidates for prevention efforts or treatments for CSVD.

— Sarah C.P. Williams

📖 “An IL-18-Centered Inflammatory Network as a Biomarker for Cerebral White Matter Injury,” *PLoS One*, January 24, 2020

A Step toward Treating Infertility with Lab-grown Eggs and Sperm

Research into how and when the precursors to eggs and sperm are formed during development could help pave the way for generating egg and sperm cells in the lab to treat infertility. The study describes the way in which human stem cells evolve into germ cells, the precursors for egg and sperm cells.

“Right now, if your body doesn’t make germ cells, then there’s no option for having a child that’s biologically related to you,” says Amander Clark, PhD, chair of the UCLA Department of Molecular, Cell and Developmental Biology and a member of the Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research at UCLA. “What we want to do is use stem cells to be able to generate germ cells outside the human body, so that this kind of infertility can be overcome.”

It is estimated that infertility affects 10 percent of the U.S. population, and infertility rates have increased over the past several decades because more people are waiting longer to have children. Many forms of infertility can be treated using procedures that join egg and sperm together outside the body, such as in vitro fertilization and intracytoplasmic sperm injection. But for people whose bodies don’t produce eggs or sperm — because of chemotherapy, radiation, genetics or other unexplained causes — those treatments aren’t an option unless a donor provides the eggs or sperm.

“With donated eggs and sperm, the child is not genetically related to one or both parents,” Dr. Clark says. “To treat patients who want a child who is genetically related, we need to understand how to make germ cells from stem cells, and then how to coax those germ cells into eggs or sperm.”

In developing male and female embryos, a subset of pluripotent stem cells — cells that have the potential to become nearly every type of cell in the body — become germ cells that later will generate eggs or sperm. Researchers previously demonstrated in a laboratory the ability to make similar stem cells, called induced pluripotent stem cells (iPS) from a person’s own skin or blood cells.

Dr. Clark and her colleagues used technology that enabled them to measure the active genes in more than 100,000 embryonic stem cells and iPS cells as they generated germ cells. Collaborators at the Massachusetts Institute of Technology developed new algorithms to analyze the massive amounts of data.

The experiments revealed a detailed timeline for when germ cells form: They first become distinct from other cells of the body between 24 and 48 hours after stem cells start differentiating into cell types that will ultimately make up all of the specialized cells in the adult body. Dr. Clark says this information can help scientists focus their efforts on that particular timeframe in future studies in order to maximize the number of germ cells they can create.

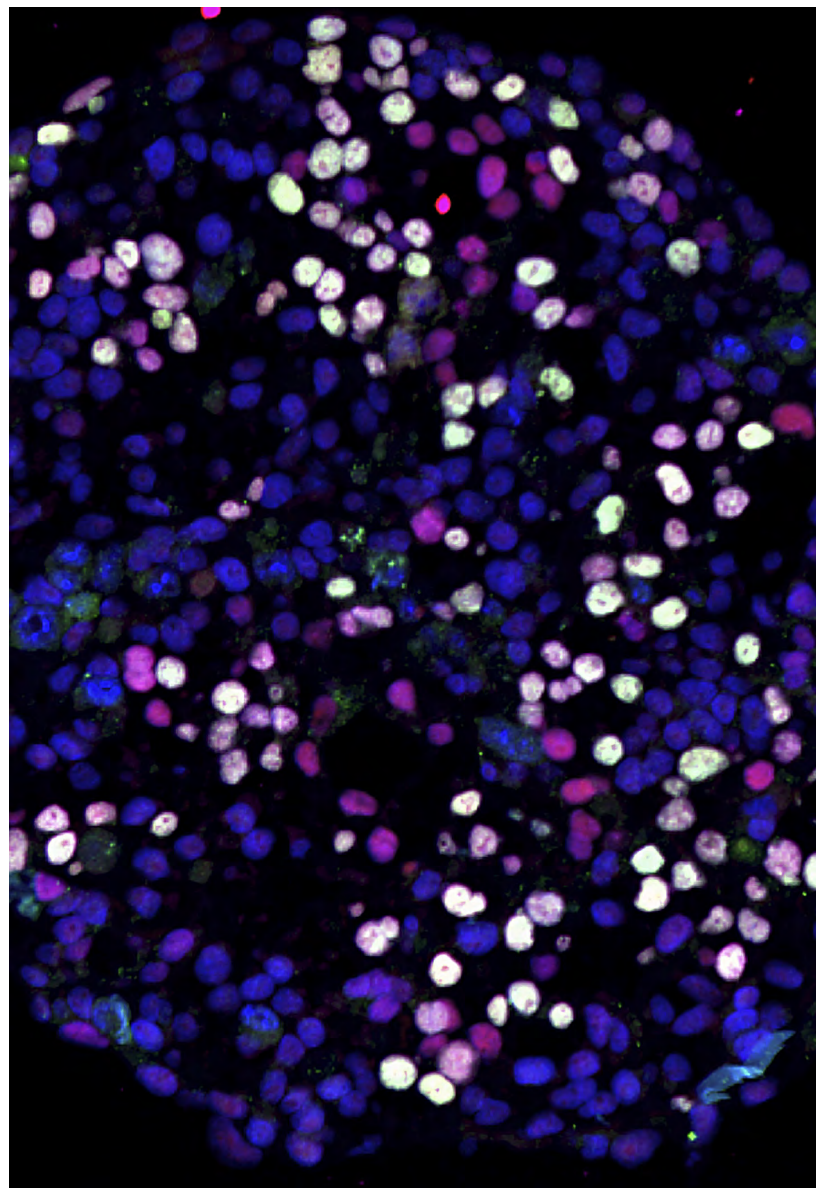
When the researchers compared the germ cells derived from embryonic stem cells with those derived from iPS cells in the lab, they

found that the patterns by which genes were activated were nearly identical. “This tells us that the approach we’re using to begin the process of making germ cells is on the right track,” Dr. Clark says. “Now we’re poised to take the next step of combining these cells with ovary or testis cells.”

If the approach were to be incorporated into a future treatment for infertility, scientists might eventually be able to use a patient’s own skin cells to form stem cells that can be coaxed into both germ cells and ovarian or testis tissue — and those cell types might be able to be used to generate a person’s own eggs or sperm in the lab.

— Sarah C.P. Williams

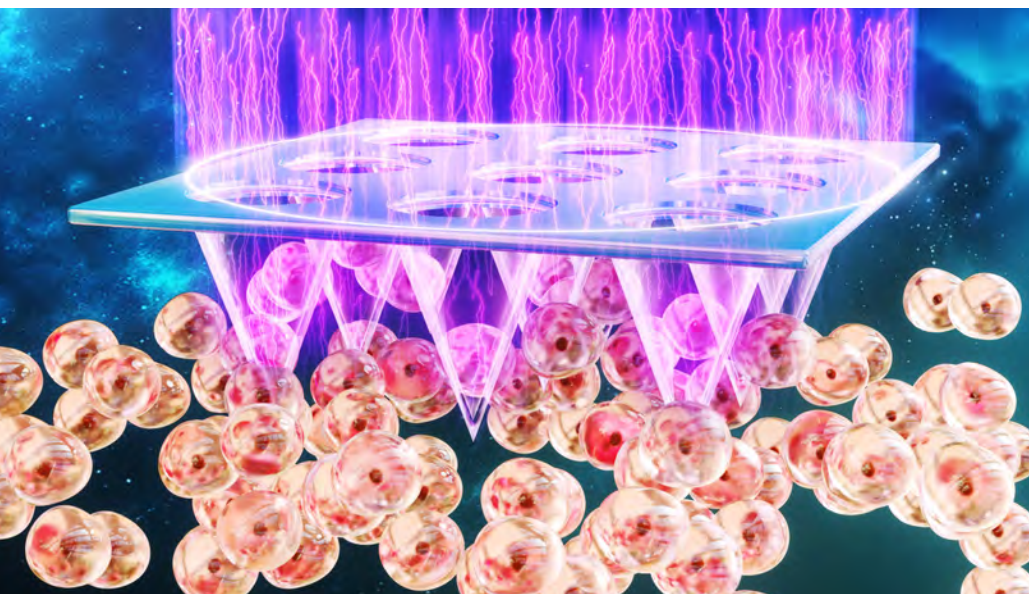
 “Human Primordial Germ Cells Are Specified,” *Cell Reports*, December 24, 2019



Differentiating human pluripotent stem cells (blue) turning into human germ cells (pink and white).

Image: UCLA Broad Stem Cell Research Center/*Cell Reports*

Cold Plasma Patch Could Enhance Immunotherapy Treatment of Melanoma



Schematic shows the thumb-sized cold plasma patch, which has more than 200 hollow microneedles that can penetrate the skin and enter the tumor tissue.

Image: UCLA Jonsson Comprehensive Cancer Center

An interdisciplinary team of researchers at the UCLA Jonsson Comprehensive Cancer Center has developed a medicated patch that can deliver immune checkpoint inhibitors and cold plasma directly to tumors to help boost the immune response and kill cancer cells. The thumb-sized patch has more than 200 hollow microneedles that can penetrate the skin and enter the tumor tissue. The cold plasma is delivered through the microneedles, destroying cancer cells, which facilitates the release of tumor-specific antigens and boosts the immune response. The immune checkpoint inhibitors — antibodies that block checkpoint proteins, which interfere with immune system function and prevent the immune system from destroying cancer cells — are also released from the sheath of microneedles to boost the T cell-mediated anti-cancer effects.

The UCLA researchers found that using the patch to deliver the two therapies to mice with melanoma enabled the immune system to better attack the cancer, significantly inhibiting the growth of the tumor and prolonging the survival of the mice. The team further found that the

therapy not only inhibited the growth of the targeted tumor, but it also could inhibit the growth of tumors that had spread to other parts of the body.

“Immunotherapy is one of the most groundbreaking advances in cancer treatment,” says Zhen Gu, PhD, professor of bioengineering at the UCLA Samueli School of Engineering and a member of the Jonsson Comprehensive Cancer Center. “Our lab has been working on engineering new ways to apply or deliver drugs to the diseased site that could help improve the effectiveness of cancer immunotherapy, and we found the patch to be a quite promising delivery system.”

The study is also the first to demonstrate that cold plasma can be effective in synergizing cancer immunotherapy. Plasma, which is usually hot, is an ionized gas that comprises more than 99% of the universe. Cold plasma was generated by a small device operating at atmospheric pressure

and room temperature; therefore, it could be applied directly to the body — internally or externally.

“This study represents an important milestone for the field of plasma medicine,” says Richard Wirz, PhD, professor of mechanical and aerospace engineering at the Samueli School. “It demonstrates that the microneedle patch can realize the plasma delivery, while also working with the drug to improve the effectiveness of cancer therapy.”

The team tested the cold plasma patch on mice with melanoma tumors. The mice that received the treatment showed an increased level of dendritic cells, which are a specific type of white blood cell that alert the immune system of a foreign invader and initiate a T-cell-mediated immune response. The group of mice also showed delayed tumor growth compared to the untreated group, and 57 percent were still alive at 60 days, while mice in other control groups had all died.

— Denise Heady



“Transdermal Cold Atmospheric Plasma-Mediated Immune Checkpoint Blockade Therapy,” *Proceedings of the National Academy of Sciences*, February 18, 2020



Illustration: Maja Moden

Voice-analysis App Effectively Monitors Patients with Mental Illness

An interactive voice application using artificial intelligence (AI) can effectively monitor the well-being of people being treated for serious mental illness, a UCLA study has concluded. Forty-seven patients under physician care for serious mental illnesses — including bipolar disorder, schizophrenia and major depressive disorder — were followed for up to 14 months using an application called MyCoachConnect. Participants called a toll-free number one or two times a week and answered three open-ended questions when prompted by a computer-generated voice: How have you been over the past few days?; What’s been troubling or challenging over the past few days?; and What’s been particularly good or positive?

MyCoachConnect was designed to collect personalized patient responses, says Armen Arevian, MD (RES '14), PhD, director of the Innovation Lab at the Jane and Terry Semel Institute for Neuroscience and Human Behavior at UCLA. Specifically, the AI was trained to use an individual’s own words to offer a personalized analysis. The application focuses primarily on the choice of words the patients use in their responses and how their responses change over time, while also taking into account audio features such as tone of voice.

The study, conducted in collaboration with researchers from USC’s Signal Analysis and Interpretation Laboratory, found that the application’s analysis was closely aligned with the physicians’ tracking of their patients’ well-being during the study period. “Technology doesn’t have to be complicated,” Dr. Arevian says. “In this study, patients didn’t need a smartphone. It could be simple and low-tech on the patient end, and high-tech on the back end.”

The researchers hope artificial intelligence that can analyze data collected from apps such as MyCoachConnect will enable more proactive and personalized care. The application, for example, could help to improve treatment by intervening early when a patient is experiencing more symptoms. Participants who were interviewed after the study ended said they found the system easy and enjoyable to use. “They said speaking to a computer-generated voice allowed them to speak more freely,” Dr. Arevian notes. “They also said it helped them feel less lonely because they knew that someone would be listening to it, and to them that meant that someone cared.”

— Marrecca Fiore

 “Clinical State Tracking in Serious Mental Illness Through Computational Analysis of Speech,” *PLoS ONE*, January 15, 2020

Litmus Test

The role of clinical laboratories in patient care often has taken a back seat to glossier areas of medicine. But in the fight against COVID-19, their efforts are at the forefront as they work to implement and develop new diagnostic tests that ultimately may determine the future course of treatment for this disease.

Omai B. Garner, PhD (FEL '12)

Associate Professor, Pathology & Laboratory Medicine

Director, Clinical Microbiology, UCLA Health

Lee H. Hilborne, MD (RES '87)

Professor, Pathology & Laboratory Medicine

Medical Director, Care Coordination, UCLA Health

Past President, American Society for Clinical Pathology

Omai B. Garner, PhD (FEL '12), associate professor of pathology & laboratory medicine and director of UCLA Health's clinical microbiology laboratory, and Lee H. Hilborne, MD (RES '87), professor of pathology & laboratory medicine and medical director of care coordination for UCLA Health, are used to being behind the scenes. The work that they and their laboratory colleagues do rarely is seen by the public, but it is essential to diagnose disease and deliver the appropriate treatment for patients. In today's fight against COVID-19, these once-unsung heroes are on the frontline of the battle.

"For years, we were on the last page of the newspaper, if we were there at all. Now we are on the front page," Dr. Hilborne says. "The importance of testing has risen to the top because the thing that will control this pandemic is going to be our ability to test and identify patients with disease."

Drs. Garner and Hilborne spoke with *U Magazine* editor David Greenwald. This Conversation was conducted online via Zoom in early April, and in this ever-evolving situation, it was not clear what might happen in the weeks and months to come before publication.

Let's start by talking about the work that has been taking place in the UCLA Health clinical laboratory since this outbreak began.

Dr. Omai B. Garner: We were one of the early labs to think about having a test in-house. Early in this outbreak, when it was decided that people flying directly to Los Angeles from Wuhan, China, would be screened for the novel coronavirus at LAX, you had to send the sample to the Centers for Disease Control and Prevention (CDC) in Atlanta and get the result back from them, which took five or six days. Then it was approved that these tests could be performed by the Los Angeles County Department of Public Health, and so samples would be sent there, with a one- or two-day turnaround. At the end of February, the Food and Drug Administration (FDA) made it possible for clinical hospital laboratories to do their own testing and to perform either the CDC test or to develop their own laboratory-developed test. That's when our lab moved as quickly as we could to begin with the CDC test, and we went live on that test 11 days later, on March 10, offering about 30 tests per day. Now, 20 or so days later, we've brought in a couple of different FDA-approved platforms to meet the need for COVID-19 testing, and we're able to offer around close to 1,000 tests



Dr. Omai B. Garner (left) and Dr. Lee H. Hilborne.
Photos: Ann Johansson

per day, with turnarounds for our inpatient and emergency department populations of four-to-six hours. The turnaround time for some other areas that don't require that level of speed is about 16-to-18 hours.

Dr. Lee H. Hilborne: On a broader scale, I think the experience of America's clinical laboratories is reflective of what Dr. Garner describes, ramping up in a very short period of time to do huge volumes. These are assays that, under normal circumstances, would take months, or even years, to develop. It took the loosening of some regulatory restrictions, as well as the dedication of the laboratory staffs like UCLA's, to get it done, but they did get it done. Is there enough testing? No, not at all. There have been reports that some labs have been overwhelmed with the number of requests, despite the fact that they've considerably ramped up testing.

How was your lab able to get up and running so quickly?

Dr. Garner: A challenge of the CDC test was that it had to be run on a very specific viral-extraction platform. If a laboratory didn't have this specific piece of equipment, it could not perform the test. We actually had two of these platforms that were used primarily for clinical research. Because our hospital system has supported our Department of Pathology to do clinical research, we had them, and we were able to pivot very quickly to using those platforms for testing. That is why we were one of the first hospital laboratories in the country to be able to perform the CDC test in-house. Then a new test for COVID-19 from a company that we use for a lot of other viral diagnostics received FDA approval, and we were able to use that test to supplement the CDC test.

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“Clearly, there currently is not enough testing, not enough supply to meet the demand. We need there to be sufficient testing, in the long term, to be able to understand where this disease is in the population, who has it and at what point someone is no longer at risk for transmitting it and can safely reengage in the community.”

What will be the future direction of testing for this disease?

Dr. Hilborne: Clearly, there currently is not enough testing, not enough supply to meet the demand. We need there to be sufficient testing, in the long term, to be able to understand where this disease is in the population, who has it and at what point someone is no longer at risk for transmitting it and can safely reengage in the community. We don’t completely understand all those issues right now, but they’re being worked on with new blood-based antibody tests. Going forward, we will be doing more of that kind of serology testing to determine if someone has developed antibodies to the virus. We don’t yet know for sure, but my sense is that it will convey immunity. We don’t know how long that immunity will last, but there is reason to believe that, in fact, those individuals who have developed antibodies should be resistant to reinfection, at least for the foreseeable future. And I think we’ll see more population-based testing, and that information will give us a better handle on the strength of the community’s immunity to the disease.

Dr. Garner: Once we are in June and July, I think we will be less worried about testing so many people for acute disease, because we will have gone through the surge and are coming down on the other side. This then becomes a larger question around antibody and immunity testing. Those are things that are going to be very important as we move toward a vaccine, however long that’s going to take — probably not before we are back into flu season in November, and we find ourselves in the same place as we are now,

experiencing the respiratory viral season in the context of symptoms potentially being COVID-19.

What might be the policy implications of this pandemic?

Dr. Hilborne: Laboratories are critical to patient care, but, as I’ve said, that sometimes has gone unrecognized. I think this experience demonstrates that there needs to be greater investment in laboratory personnel and training the next generation of laboratory professionals. Many of the programs that train laboratory staff have closed, and, so, the average age of the laboratorian now is much older than it was when I started several decades ago. As people retire, we are approaching the edge of the cliff where there will be a shortage of trained personnel. Now there is greater recognition of how important laboratory professionals are to the broader mission of health care, and we need to reinstate training programs that have been lost.

Dr. Garner: I think that this particular crisis also has revealed some of the regulatory challenges that clinical laboratories face. Often, the regulatory bodies that oversee clinical labs have been unable to respond fast enough to issue emergency-use authorization to meet the need for diagnostic testing in an emergency situation. I think that is something that needs to be revisited. In today’s globally connected world, the potential for pandemic disease is increased, and it is vitally important to be able to move quickly to implement diagnostics. Countries that were able to move quickly — South Korea is a great example — were able to be better

“In today’s globally connected world, the potential for pandemic disease is increased, and it is vitally important to be able to move quickly to implement diagnostics. Countries that were able to move quickly — South Korea is a great example — were able to be better prepared for this particular outbreak.”



Photos: Courtesy of the American Society for Clinical Pathology

prepared for this particular outbreak. This doesn't fall exclusively on the FDA, but one of the reasons we weren't as prepared as we should have been was due to the lack of testing, and part of the reason for that lack was that clinical labs were hampered in their ability to perform any testing whatsoever until the end of February. That was a really long lag time in this outbreak. So, I think there are opportunities for relooking at the regulations around diagnostic testing to be able to create a pathway that can move faster in something like a global pandemic.

Dr. Hilborne: From a policy perspective, that is front and center. How much oversight is appropriate? In the United States, we have better testing than anywhere else, and that's due, in part, to our infrastructure. We certainly don't want to blow that up, but the question is, how do you rightsize it to be able to provide high-quality laboratory testing without creating huge burdens?

Dr. Hilborne, in a conversation with the executive vice president of the American Society for Clinical Pathology, you said that now is the time for scientists to come together to do the right thing. What did you mean by that?

Dr. Hilborne: What I meant was that it is important for us to have the correct and factual information on which to base decisions. Managing an epidemic is not a political issue; it is a scientific and epidemiologic issue. In a situation like this, it is scientists who should be influencing the policies for how we manage it. What we need are clear facts, we need truth and we need to be able to have it in real-time.

When you first heard reports about this disease out of China, what did you think? Did you anticipate at that time how this would evolve?

Dr. Garner: I'm a big history-of-virology and history-of-infectious-diseases buff. And so I know that spillover, which is this concept of an animal virus moving into human beings, happens all the time. And because I know that actually happens a lot, it didn't light up my radar as anything that was going to be huge. Then, as we were watching it proceed and move to a human-to-human transmission stage, I started to think about other coronaviruses that were out there — SARS, MERS. These were viruses that were not really easy to pass human to human. And so, in that setting, I was interested in what was happening, but I had no idea that this was going to be anything like what it has become. This was still early on in the outbreak. It wasn't until I started talking with the assistant director in my lab, a molecular diagnostic microbiologist, Dr. Shangxin Yang (PhD, FEL '16). He said to me, "Omai, this is going to be really bad." I was a little bit incredulous. But he had been talking with family and friends and university colleagues in China and who were near Wuhan and hearing their accounts and seeing the photos they were sending him. "No, no, it's going to be worse than SARS," he told me. Listening to him — that flipped a switch for me. It is hard when an outbreak is starting thousands of miles away to be able to appreciate how bad it's going to be. But he was right.

"Managing an epidemic is not a political issue; it is a scientific and epidemiologic issue. In a situation like this, it is scientists who should be influencing the policies for how we manage it. What we need are clear facts, we need truth and we need to be able to have it in real-time."

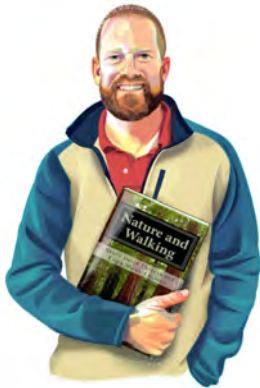


[Read about Dr. Shangxin Yang's experience in Epilogue, "The Messenger," pg. 52](#)

Natural Wonder

Thomas Vondriska, PhD
Professor, Anesthesiology, Medicine & Physiology

ILLUSTRATIONS BY NIGEL BUCHANAN



Dr. Thomas Vondriska and his colleagues are studying how genetic and environmental factors interact to cause cardiovascular disease. Their mission is to discover the basic biological principles of chromatin — the material of which chromosomes are composed — and lay new foundations for the future development of therapies and cures.

Dr. Vondriska steps into the *U* Magazine spotlight

When did you first start to think seriously about science?

Probably when I was maybe 4 or 5 years old. I was only allowed to watch PBS when I was growing up, and I spent a lot of time watching *Nova* and *National Geographic* and shows where they constantly were exploring outside. I would watch these shows, and I always had this question in my mind, “How did the scientists ever figure out all of these details? How did human beings come to know this much about the natural world?”

Who is your science hero?

My father. He was not a scientist, he was a civil servant, but I spent a lot of time with him outdoors, and he taught me to be driven by curiosity and to accept our ignorance as human beings.

Where are you happiest?

In the middle of the woods somewhere, as far away as possible from any cell service.

What do you consider to be your finest achievement?

The environment of collegiality and creativity that has been fostered in my lab. That is something I am very proud of.

What characteristic most defines you?

I’m pretty analytical and philosophical, maybe at times to a somewhat obnoxious degree.

What are the qualities of a great scientist?

Creativity. Curiosity. Perseverance. Humility. If I were to rank them, creativity and humility have to be tied for No. 1.

What do you value most in your colleagues?

Honesty. Colleagues who are honest and give candid feedback I find extremely valuable. There’s also self-honesty. We all struggle with allowing our egos to be broken down to the point where we can understand whether or not what we are working toward is driven by a thirst for knowledge versus a thirst for recognition. If we can be honest with ourselves and recognize what really is motivating us, then we can be open to honest feedback and criticism. If we could get less ego and more honesty into the scientific discourse, it would really allow discoveries to move forward more quickly.

What is your motto?

This is going to sound maybe too earnest, but something that I find myself saying is that nothing worth doing is easy. It is like JFK said, we go to the moon because it is hard. That is something that maybe defines the American spirit in a way. I certainly hope so.

What is your greatest virtue?

I think that is for other people to judge.

What is your greatest fault?

Impatience.



Whom do you most admire?

People who are able to define for themselves what success is and pursue it and not let anything or anyone dissuade them from that. I have met people like that throughout my life, in all kinds of different fields and professions, and I gravitate toward them.

When don't you think about science?

When I'm asleep. Otherwise, I would say that there's no time when I don't have the potential for some thought to cross my mind. I can compartmentalize, and I can disconnect, but I think one of the privileges of a career in science is that I get to think about these things all the time, if I choose to do so.

If not a scientist, what would you be?

Maybe I'd write the "Lexington" column for *The Economist*, or maybe I'd be a park ranger or a professional cyclist.

What is your most treasured possession?

A belt buckle from Philmont scout ranch in New Mexico, which I went to twice when I was in high school. It basically was a 10-day outdoor experience, during which you carry everything you would need on your back. It was a very formative experience. The buckle reminds me of that and also of scouting in general. I met all of my closest friends from childhood through scouting.

What keeps you up at night?

I'm a Luddite when it comes to technology, and I worry about what kind of dystopian world my children might find themselves living in where we're so dependent on technology, where meaningful

human interaction and creativity are supplanted by narcissism and consumerism and a loop of instant gratification. I really do think that it is changing who we are as human beings, and in a not productive way, and I am concerned about it.

To which superhero do you most relate?

I sometimes think there's something wrong with me in terms of my disconnect from modern pop culture, but I pretty much dislike all of the superhero movies, with the possible exception of Heath Ledger's Joker character in *The Dark Knight* Batman movie. The one movie character I maybe relate to is Jason Bourne. The whole idea of this man who has amnesia but amazing survival skills, and who has to figure things out as he goes along, is a good analogy for the human experience.

How do you want to change the world?

I am very motivated by the belief that the work we are doing could someday have a real impact on patients with cardiovascular or other forms of disease. I'm also very motivated by the idea that some of the things we're studying in the lab could have general applicability and could help define new basic mechanisms of biology as they relate to the function of chromatin.

What is your definition of happiness?

Freedom, and knowing what to do with it.

What is your idea of misery?

Not having anything good to read.

HARD CHOICES

BY DAN GORDON • ILLUSTRATION BY ROBERT BALL

In the face of a pandemic that threatens to overwhelm hospitals across the country, UCLA wrestles with troubling questions about how to deliver the most appropriate care in a potential environment of limited resources.

As the pandemic of novel coronavirus took hold across the globe, hospitals throughout the United States were confronted with the frightening reality that they could be overwhelmed as never before. News and personal accounts from China and Italy pointed to dire conditions that soon might cross the oceans and land on America's shores — more critically ill COVID-19 patients needing treatment than there were intensive care beds and shortages of lifesaving equipment such as ventilators. For the doctors, nurses and other health care professionals who would be manning the frontlines to confront the anticipated onslaught of cases, there were the added anxiety and fear that they might be placing themselves and their loved ones at risk in the line of duty, particularly amid reports of shortages of personal protective equipment (PPE).

These and other concerns have compelled health care leaders at UCLA and across the country to plan for contingencies they hoped never to experience and to wrestle with ethical questions that have no easy answers.

At the first indication that a surge in COVID-19 cases might be unavoidable, mobile tents went up outside the Ronald Reagan UCLA Medical Center and UCLA Medical Center, Santa Monica emergency departments, a visible sign that UCLA Health, like all major health systems in the U.S., was taking steps to expand its capacity. Elective surgical procedures were postponed, extra equipment was stockpiled, PPE was fortified and frontline emergency and critical-care staff was bolstered in anticipation of the influx of patients.

“The goal is to have the resources to handle all of the cases that come in. Unlike a natural disaster such as an earthquake, with a contagion like this, you have lead time that allows the system to plan to take on many more patients during a surge,” says Neil S. Wenger, MD '84 (RES '87, '90, FEL '89), MPH, professor of medicine and chair of the Ronald Reagan UCLA Medical Center Ethics Committee. “But, of course, systems also have to plan for the possibility that even after increasing their capacity as much as possible, their supply of beds, equipment, doctors and nurses is exceeded.”





Left: Dr. Clarence H. Braddock III: “In a triage situation, such as in wartime, the next available resource might go to the person who is most likely to recover.” **Right:** Dr. Neil S. Wenger: “Systems ... have to plan for the possibility that even after increasing their capacity as much as possible, their supply of beds, equipment, doctors and nurses is exceeded.”

Opposite Page Top: Dr. Rochelle A. Dicker: “We, by-and-large, live in a land of plenty, so the thought that we may have to make choices about how we deliver the most appropriate care in an environment in which we may not have sufficient resources is incredibly sobering.” **Opposite Page Bottom:** Dr. Thomas B. Strouse: “Because UCLA has been doing solid-organ transplants for decades, the ethical concepts related to maximizing benefits under conditions of limited resources — how to do so rationally, justly and equitably — are routinely discussed by many people here.”

Photos: UCLA Health

In a situation in which every ICU bed in the city is full, “hospitals would face the conundrum of how we fairly, rationally and consistently make decisions on the allocation of limited resources,” adds Clarence H. Braddock III, MD, MPH, professor of medicine and vice dean for education at the David Geffen School of Medicine at UCLA. “That’s a huge challenge.”

Scenarios such as what occurred early on in other parts of the world raise perilous questions. Hospitals under normal circumstances take heroic measures to save the lives of all critical-care patients, but in a surge, with resources stretched beyond their limit, they might have to adopt a triage mode, prioritizing which patients will receive the attenuated supply of interventions based on factors such as the severity of their condition and likelihood of recovery.

For UCLA Health, an institution within whose vision statement are embedded the words “to heal human kind ... by alleviating suffering and delivering acts of kindness,” having to make such choices is nearly unthinkable. “It is our mission as medical providers to preserve or prolong life, so in a normal situation, the next available ICU bed or ventilator goes to the person who is sickest,” says Dr. Braddock, who before coming to UCLA served as chair of the ethics committee at Stanford University School of Medicine and director of the Bioethics Education Project at the University of Washington. “In a triage situation, such as in wartime, the next available resource might go to the person who is most likely to recover.”

These are the troubling issues with which physicians across the country have been grappling and debating with each other over online and social

networking channels and in journal and newspaper opinion articles since this pandemic erupted.

THOUGH IT IS A SCENARIO NO HEALTH SYSTEM EVER WISHES TO CONFRONT,

preparing for the possibility that not every patient will have access to lifesaving treatment, or that the demands on health care personnel will require them to prioritize which cases receive their attention, necessitates the adoption of a different mindset for everyone involved — health care workers, patients and families — as well as clear guidelines for how these heart-wrenching decisions would be made.

The University of California (UC) responded early in the pandemic to convene an 18-member working group of bioethicists and critical-care specialists from across the UC’s six medical campuses to develop systemwide guidelines — based on ethical principles that include a duty to promote health and avoid harm, respect for persons and justice — for the allocation of critical resources if a surge exceeds available capacity. “In a severe crisis, these principles may be in tension, either with each other or with themselves,” states the report, which was released in April (as were guidelines by the California Department of Public Health) and will continue to undergo review, public input and revision over the next several months. “In such situations, medical institutions must shift from their traditional focus on individual patients to a focus on populations, the common good and the protection of civil society. As the National Academy of Medicine wrote: ‘Ultimately, this shift represents not a rejection of ethical principles but their embodiment.’”

The tension that the report acknowledges is evident in the language of those on the frontline who must grapple with this issue. “As Americans, we are not used to being in a situation where we might have a scarcity of resources to the extent we potentially could experience in an event such as this,” says Rochelle A. Dicker, MD, UCLA professor of surgery and anesthesia, vice chair for surgical critical care and chair of the UC working group. (Dr. Wenger and Russell G. Buhr, MD [FEL ’17], PhD ’19, UCLA assistant professor of pulmonary and critical care medicine and chair of UCLA’s Crisis Standards of Care-Disaster & Pandemic Response Team, also were members of the working group.) While there are significant health-care disparities and inequities in the United States, “we, by-and-large, live in a land of plenty, so the thought that we may have to make choices about how we deliver the most appropriate care in an environment in which we may not have sufficient resources is incredibly sobering,” Dr. Dicker says.

Before wading into the details of the guidelines, the panel worked to erect an ethical scaffold around which to build its discussions. “This was a group of incredibly ethical, moral and thoughtful individuals,” Dr. Dicker says of her colleagues on the panel. Once that framework was established, “the rest of our conversations, which certainly were intense, flowed from our alignment on the ethical principles.” At the core of those ethical principles was “saving the most lives — which is what we do under normal circumstances — within the context of a duty to prepare and a duty to conserve scarce resources,” Dr. Dicker says. Addressing such issues was an intense experience, but, ultimately, she says, “I’ve never had more pride in being a part of the University of California than I have in this moment.”

THERE IS, IN NORMAL TIMES, ONE NOTABLE EXCEPTION IN WHICH SCARCE RESOURCES DICTATE that mechanisms be developed to determine how lifesaving treatment is allocated: organ transplantation. Because there is a limited supply of donor organs available for transplantation, a federal system has been developed, overseen by the United Network for Organ Sharing, to prioritize patients for transplants based on factors that include waiting time, medical condition and prognosis. It is a system that is administered at the regional

level rather than by individual hospitals. “Because UCLA has been doing solid-organ transplants for decades, the ethical concepts related to maximizing benefits under conditions of limited resources — how to do so rationally, justly and equitably — are routinely discussed by many people here,” says Thomas B. Strouse, MD (RES ’91), medical director of the Stewart and Lynda Resnick Neuropsychiatric Hospital at UCLA and the inaugural holder of the Maddie Katz Chair in Palliative Care Research and Education.

Those issues are relevant in the current situation. Since the pandemic began, medical ethicists around the world have been struggling to address such questions as: If a hospital is inundated by COVID-19 cases, how does that impact patients with other conditions? In a system that seeks to maximize the benefits accrued from the allocation of limited resources, does a younger person take priority over an older person, given their longer life expectancy? Should a patient’s underlying health conditions be weighed, and if so, how?

The calculus of determining who would be the best candidate to receive life-saving care in a situation that necessitates medical triage might seem obvious — an individual with good long-term prognosis who needs a ventilator to survive as opposed to a patient with a terminal illness who has only days to weeks to live and has become sick with the coronavirus, for instance — “but in the vast majority of cases, it isn’t so simple,” Dr. Wenger says. “We need objective measures. People are working to build models that produce an estimate of survival, but there are many variables, and much work is necessary to avoid bias.”

Dr. Wenger notes that some of the issues raised in a crisis like this point to similar concerns that arise in hospitals nearly every day, such as when is it appropriate to withdraw lifesaving measures? “In a way, this is something of a teachable moment. What is happening now makes it clearer that it is important to think about the future and one’s priorities,” Dr. Wenger says. “This is what advance care planning is all about: communication about one’s values and goals and how those translate into preferences in the setting of potential danger.” Dr. Wenger says that primary care physicians now are being asked to emphasize these kinds of conversations with their patients. “This is an important issue for everyone to consider,” he says.

“We know that in our country, there are inequities in who gets the best care. At a societal level, we must ensure that in a crisis in which resources are strained, those inequities do not get magnified.”



“Within the first 24-to-48 hours, you might make certain decisions that then have to change, as your volume of patients continues to increase and your resources decline. At that point, it becomes more important to ensure that energies are directed toward patients most likely to benefit from aggressive measures.”

IN ANTICIPATION OF THESE

CHALLENGES, federal agencies, states and professional organizations have developed general recommendations for approaches to allocating scarce resources during a pandemic, and hospitals and health systems like the UC have brought together medical ethicists and other clinical leaders to determine how they will put them into practice. Dr. Wenger explains that having well-established guidelines is critical, so that treatment decisions are made rationally and equitably, rather than in an ad hoc manner. Transparency, consistency and accountability are all essential in the implementation of such guidelines. In an op-ed in the *Los Angeles Times* that he co-authored with Martin Shapiro, MD, professor of medicine at Weill Cornell Medical College in New York City and formerly chief of the Division of General Internal Medicine and Health Services Research at UCLA, Dr. Wenger noted: “The American public needs to be educated on the rules for medical decision-making so that it’s clear why some patients receive [lifesaving] treatment while others do not.”

Failing to use objective measures to allocate scarce resources risks tilting the scales toward those with wealth and influence. “We know that in our country, there are inequities in who gets the best care,” Dr. Wenger says. “At a societal level, we must ensure that in a crisis in which resources are strained, those inequities do not get magnified.”

A group providing oversight in the implementation of guidelines is important, Dr. Braddock adds, both to ensure that the policies are being fairly adhered to and so that frontline clinicians working under extreme pressure aren’t tasked with making these difficult judgments on their own. “You probably don’t want individual clinicians having to make these decisions, but instead, recognizing circumstances at the bedside and then referring to a deliberative body that can review a series of situations across the hospital,” he says. “That also allows the individual physician to remain solely focused on responsible advocacy for the best interests of the patient.”

One principle on which there is broad agreement concerning resource allocation is to make the health of frontline clinicians, along with other emergency workers, a high priority, given that their services are essential to the efficacy of the pandemic response. This is a triage strategy known as multiplicity. “Part of the rationale is that health

care workers need to know that if they are putting themselves in danger, they will receive treatment, if necessary,” Dr. Wenger says. “Their ability to continue functioning is critical to addressing the needs of patients in a pandemic.”

Beyond that, ethicists have pointed to the need to draw on utilitarian principles aimed at maximizing benefits to the largest number of people and prioritizing patients — whether they are COVID-19 patients or individuals with other medical conditions — most likely to benefit from care and those with the best chance for the longest remaining life. This diverges from the usual approach, in which care is delivered on a first-come, first-served basis. In a worst-case scenario, “this means that ventilators and ICU beds should be denied to or withdrawn from patients for whom the benefits are minimal at best and those resources given to patients who are more likely to survive,” Dr. Wenger wrote in his *Times* op-ed. He acknowledges that these are “gut-wrenching” choices for everyone involved, and they “must be carried out with compassion, support and palliation.”

Dr. Wenger points out that a different calculus is likely to present itself when an effective treatment or vaccine for COVID-19 becomes available. In the case of a vaccine, for example, maximum benefit would likely be achieved by prioritizing not only frontline health care workers, but also groups at the most risk of experiencing poor outcomes if they contracted the disease, including older patients and individuals with chronic conditions that leave them vulnerable.

ALTHOUGH THE MAGNITUDE OF THE COVID-19 PANDEMIC MAY BE UNPRECEDENTED IN MODERN TIMES,

the prospect of a surge of critically ill patients requiring triage decisions related to allocation of staff time and resources is something for which every emergency clinician has prepared, notes Medell K. Briggs-Malonson, MD (RES ’09, FEL ’12), MPH, a UCLA Health emergency physician, who serves as both director of quality for the Department of Emergency Medicine and the medical director of clinical effectiveness for UCLA Health. “We are trained in responding to mass-casualty incidents, where you have a wide variety of patients ranging from the walking-well to those who are so close to death that there is little we can do to help them, and everything in between,” Dr. Briggs-Malonson says.

The emergency department (ED) is the frontline in the battle against COVID-19, as it is for other highly infectious diseases, adds Gregory Hendey, MD (RES '93), chair of the UCLA Department of Emergency Medicine. "We have to stay ahead of the curve because the ED is the point of the spear, the first place a patient would go."

Although general triage guidelines have been formulated from experiences with incidents such as natural disasters and mass shootings, Dr. Briggs-Malonson explains that each hospital and its emergency department must develop its own system based on the resources and personnel it has — and that each situation is fluid. "Within the first 24-to-48 hours, you might make certain decisions that then have to change, as your volume of patients continues to increase and your resources decline," she notes. "At that point, it becomes more important to ensure that energies are directed toward patients most likely to benefit from aggressive measures."

The difference when the emergency response involves a pandemic infectious-disease outbreak is the potential risk from being exposed to patients — requiring measures to ensure the safety of the doctors, nurses and other staff. "Although we're highly skilled and comfortable with these mass surges of patients and the need to triage, we have to be very thoughtful about how we minimize the risk to our health care workers, because if they become infected, it has an impact on our ability to care for the community," Dr. Briggs-Malonson says.

Emergency physicians responding to COVID-19 cases must consider not only how to protect the safety of their patients, but also how to protect their own safety and that of their clinical team. "In a sense, it's like being on a battlefield, in which you're trying to provide optimal care while minimizing the number of people who have to wade into the conflict," Dr. Briggs-Malonson says. "That is not something we would have to think about in the traditional practice of emergency medicine."

She notes that beyond wrestling with the difficult ethical questions raised by the COVID-19 pandemic, health systems have a responsibility to address the secondary trauma of frontline staff who are working long hours in these battlefield-like conditions, caring for critically ill patients while confronting their own fears about potentially placing themselves and their families at risk. Providing support and looking after the psychological wellness of the health care team is

vital, Dr. Briggs-Malonson explains, both to ensure that clinicians are at their best when they see patients and as a moral obligation to those who are putting themselves on the line.

"As emergency personnel, our job is to save lives, but we go home every day with a heavy heart," she says. "There are people walking the halls of emergency rooms and ICUs who know it is their responsibility to be there, but they see health care workers across the country getting sick, and they worry about themselves and their families. It's important that they have a safe space and a supportive environment in which they can talk about their feelings and that they can take wellness breaks when they need them."

Dr. Strouse agrees, and he has worked with other UCLA Health leaders to ensure that staff have access to a wide array of mental health support services. "These are difficult personal decisions each clinician is making, especially when we hear about hospitals that have had shortages of PPE," says Dr. Strouse, who has taught and written extensively on ethical issues in end-of-life care. "For most of us, though, this is part of our core identity — taking care of sick people even if it means making sacrifices, including putting ourselves in jeopardy."

"Every health profession has a tradition in which there is a responsibility to care for patients even if it entails some risk," Dr. Braddock says. "COVID-19 challenges our understanding of how much risk we should be expected to take, but most people are recognizing that obligation and meeting the challenge." Dr. Braddock says he knows of cases in which frontline health care workers with families at home have undertaken extra precautions, such as quarantining themselves to one room within their homes.

"Clinicians do not have an ethical duty to put themselves at very serious risk of harm," Dr. Wenger says. "But we do have a duty to treat patients within the constructs of the best available protection. The question is where that line is. Here, and across the country, we have seen our health care providers stepping up."

Dan Gordon is a freelance writer in Los Angeles and a frequent contributor to *U Magazine*.



For more information and UCLA-related resources about COVID-19, go to: uclahealth.org/coronavirus



Dr. Medell K. Briggs-Malonson: "As emergency personnel, our job is to save lives, but we go home every day with a heavy heart."

Photo: Dr. Kellie Kitamura



Vape Not

By Veronique de Turenne • Illustrations by Mark Sojka

E-cigarettes originally were intended as a replacement for carcinogenic tobacco products, but today it is known that they foster addiction and create their own sometimes life-threatening medical issues.

Even before the patient crashed, her lungs unable to function, critical-care pulmonologist Kathryn Melamed, MD '12 (FEL '18), sensed that something about the case was amiss. The patient was young, just 18 years old, and prior to her hospital admission, she had been healthy. Yet, here she was, in the ICU at Ronald Reagan UCLA Medical Center, with a high fever, shortness of breath and a wet, heavy cough — winter-flu-like symptoms, even though it was mid-August.

The illness that brought her to the hospital progressed so rapidly, the entire care team was startled. Soon after becoming Dr. Melamed's patient in the ICU, the young woman struggled to breathe. Unlike an initial X-ray, in which a white haze at the bottom of her lungs suggested pneumonia, a subsequent scan ordered by Dr. Melamed came back almost completely opaque. The patient's lungs, severely inflamed, had rapidly filled with fluid.

"You might expect someone who is chronically ill or who has a weakened immune system to develop a pneumonia that gets quite severe," Dr. Melamed says. "But to see someone who is healthy and young develop a severe illness that quickly is very concerning, and it quickly becomes life-threatening. There was a real chance that she was going to die."

After almost a week on a respirator under sedation, the patient did begin to recover. At the same time, the Centers for Disease Control and Prevention (CDC) released a warning about

a spate of unusual vape-related lung injuries, which corroborated Dr. Melamed's suspicions.

"This all took place just before the CDC gave its warning, but there had been a few news stories about potential vape-related cases in Ohio, so I had an idea of what might be going on," Dr. Melamed says. "Then, with the CDC's announcement, we got even more confirmation that this was what was happening with our patient."

Severe lung injuries have come to symbolize America's growing vaping crisis. Known as EVALI, an acronym that stands for 'e-cigarette or vaping product use-associated lung injury,' it was officially recognized by the CDC in August 2019. EVALI cases have led to numerous long-term hospitalizations, several lung transplants and a number of deaths. As of late February, the agency reported more than 2,807 hospitalized EVALI cases in all 50 states and 67 deaths. Initial research has linked the EVALI outbreak to black-market cannabis-based products and certain additives, but the exact cause still is not known.

The dramatic and grave illnesses of the EVALI epidemic have dominated news coverage of vaping. But physicians at UCLA warn that nicotine-based e-cigarettes, which now are addicting children and adolescents in record numbers, pose a far greater danger. Offered in an array of enticing flavors and loaded with amped-up forms of nicotine, e-cigarette technology opened

a Pandora's box of ills. And, with lax oversight compounded by a lack of regulation, most of the product's ingredients remain a mystery. So do the potential effects of both short- and long-term use. Without crucial information, health professionals say that young people have become test subjects in what amounts to a vast and unregulated experiment. At the same time, with billions of dollars in annual profits at stake, competing interests are fighting for control of the products, the laws that govern them and the narrative.

"The forces at play are so powerful, that we need to be able to place research and facts in front of our community, our patients and the world about this very serious problem."

"We have been presented with a very serious problem related to lung injury, largely with those products that deliver THC; however, the true catastrophe lies in the addiction of young people and children to nicotine, and we should not take our focus off that problem at any time," says lung-cancer investigator Steven M. Dubinett, MD (RES '84), associate vice chancellor for research and division chief of pulmonary and critical-care medicine. "The forces at play are so powerful, that we need to be able to place research and facts in front of our community, our patients and the world about this very serious problem." Otherwise, he says, "the enormous harm that is in the offing for children and young adults amounts to a tsunami of addiction that is swelling to engulf an entire generation."

E-CIGARETTES, ALSO KNOWN AS ELECTRONIC NICOTINE-DELIVERY SYSTEMS, or ENDS, were invented with the initial intent of helping smokers quit. Today's devices, which bear little resemblance to the original mechanism, go by a variety of different names. These include vapes, vape

pens, tanks and mods, nomenclature that refers to the various technologies involved in nicotine delivery. They work by using a battery to heat a liquid solution until it produces an aerosol that can be inhaled. The solutions, often referred to as e-liquids, typically include nicotine and flavoring agents, as well as solvents, which help generate the aerosol.

Users purchase a vaping device, which they then fill with the e-liquid of their choice. There are thousands of products on the market offered by major manufacturers as well as mom-and-pop operations. The devices also are the subject of a thriving black market, with a variety of off-label products available online. To make their own products, users have only to turn to YouTube to find tutorials on making e-liquids.

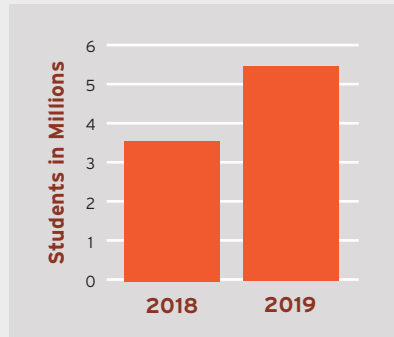
In the commercial vape marketplace, both the e-liquids and the devices that deliver them have, until recently, been largely free from regulatory oversight. In addition to two basic ingredients — nicotine and solvents — the e-liquids include numerous unnamed ingredients. "These are unregulated products, so really we don't know what's in them," Dr. Dubinett says.

The content of the e-liquids varies not only from manufacturer to manufacturer, but also from batch to batch. This makes it impossible for users to know what's in any of the thousands of different products that are available and poses unique challenges to researchers working to study the health effects of vaping habits.

"Unlike nicotine-replacement therapies like gum or a patch, which had to undergo product review, with vaping we are talking about unregulated products that are being marketed directly to the consumer. That makes it really difficult to comment on the safety of these devices," says Michael K. Ong, MD, PhD, UCLA professor-in residence of medicine and health policy and management and chair of the California Tobacco Education and Research Oversight Committee. "The way a regular cigarette is constructed is very well-known, whereas these vaping products haven't undergone the rigorous testing of other consumer products." That, Dr. Ong says, is a critical concern. "This is a technology that lets a manufacturer add all sorts of additives and flavors, but we have not had a regulatory environment that restricts them in any way, let alone one that requires manufacturers even to reveal what's in their products."



Between 2011 and 2015, the use of **e-cigarettes** among high school **students** surged **900%**, according to a report released in 2016 by then-Surgeon General Vivek Murthy.



Between 2018 and 2019, the number of **middle** and **high school** students who used **e-cigarettes** jumped by **1.8 million**, from **3.6** to **5.4 million**.

By 2019, more than **10%** of **middle school** children reported **vaping** in the previous 30 days. This number jumped to **27.5%** when **high school** students were surveyed.

What is clear is how strongly nicotine-based e-cigarettes appeal to — and, ultimately, addict — the youth market. According to the CDC, most tobacco smokers launch their habits in early adolescence. Research shows that close to 90 percent of smokers will have tried their first cigarette by the age of 18. Only two percent of smokers will start the habit after age 26. Thanks to decades of education, regulation and advocacy, the youth smoking rate had hit a historical low at the turn of the last century.

Then came vape products. Peddled in appealing flavors like mango, fruit, bubblegum and crème and presented in cheery, child-friendly packaging, they took direct aim at the youth market. The result was a spike in the numbers of new e-cigarette users and an equally dramatic drop in their age. Between 2011 and 2015, the use of e-cigarettes among high school students surged 900 percent, according to a report released in 2016 by then-Surgeon General Vivek Murthy. Between 2018 and 2019, the number of middle and high school students who used e-cigarettes jumped by 1.8 million, from 3.6 to 5.4 million. By 2019, more than 10 percent of middle school children reported vaping in the previous 30 days. This number jumped to 27.5 percent when high school students were surveyed.

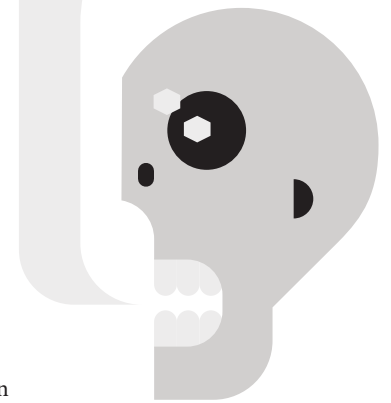
The biggest driver of the e-cigarette revolution has been Juul, a company whose name quickly became a verb to describe the use of its products. The company made savvy design decisions for its vaping devices, which resemble a flash drive and can be charged in a USB port. They also released products that critics say

deliberately targeted the youth market, including children, with cute names in kid-friendly flavors and bright-colored cartoon-like packaging.

“Juul often is referred to as the iPod of e-cigarettes,” says Eric Hamberger, MD, a pediatric pulmonologist at UCLA. “They use a lot of the same design elements that you see in Apple products, like the small, brushed-metal cases that are sleek and squared-off. But Juul’s real claim to fame is the formulation that they came up with — nicotine salts.”

Based on research conducted by legacy tobacco companies in the mid-1900s, Juul adjusted the chemical formulation of its e-liquids. Known as nicotine salts, they make the stimulant easier to use and markedly more palatable. “The engineers at Juul realized that a lot of the harshness of nicotine came from the pH of the liquid,” Dr. Hamberger says. “When people took a hit of the e-cigarette vapor at a lower pH, which allows it to be stable in the liquid form, it’s much less harsh on the inhale. With nicotine salts, they really turned vaping into a science.”

Gone was the choking, burning sensation that beginning cigarette smokers endure as they





inhale. Instead, with solvents and other additives to “soften” the aerosol and a range of flavors to appeal to the palate, the company created a product that even first-time smokers could take deep into their lungs from the first pull. The company soon began to offer products with dramatically higher concentrations of nicotine. Previously, vendors sold e-liquids with nicotine concentrations in the one-to-three-percent range. But Juul raised the ante with refill products that deliver five percent nicotine. Between 2016 and 2017, sales at Juul jumped 641 percent. By December 2017, the company’s products made up the biggest share

of the vaping market. That spike in nicotine concentrations sent competitors scrambling to catch up. Today, refills at five-to-seven-percent nicotine are the industry standard. As a consequence, widespread addiction has followed.

HIGH CONCENTRATIONS OF NICOTINE ARE PARTICULARLY HARD ON ADOLESCENTS, who are much more likely to become addicted due to their developing brains, says Bonnie Halpern-Felsher, PhD, a developmental psychologist and professor of pediatrics in the Division of Adolescent Medicine at Stanford University with expertise

in health-related decision-making by adolescents and young adults. This propensity to addiction during adolescence is due to brain development that takes place during this period. “As you grow into adulthood, your brain continues developing and looking for cues about synaptic connections that it can prune away and those it needs to keep,” Dr. Halpern-Felsher says. “When you introduce a substance during this time, the brain pathways associated with the drug use are kept and strengthened. In the case of e-cigarettes, the nicotine-receptor pathways become more strongly connected with the brain’s internal pleasure pathway, the dopaminergic reward system, making it much easier for young people to become addicted to nicotine and also more difficult to quit that addiction.”

With little understanding of what vape products contain, adolescents have been ideal targets for the vaping industry, she says. “They’ve been lied to by the e-cigarette industry, which went around saying these products are healthier, safer than cigarettes and are meant for smoking cessation,” she says. “But then they also advertised the products as being fun and invited young people to just give them a try. It becomes clear when you look at the ads, which directly target children and adolescents with the flavors and the names.”

That leap from merely fooling around with vape products to being unable to put them down turns out to be all too easy. “Nicotine is one of the most addictive compounds there is, so much so that it has been compared to heroin,” says UCLA cardiologist Holly R. Middlekauff, MD (RES ’89, ’92, FEL ’90, ’92). “And then it’s just tremendously hard to break that addiction, which is part of why smoking cessation rates, despite everybody knowing how bad it is for you, are so low, in the range of five or 10 percent.”

The original argument in favor of e-cigarettes focused on their use in place of tobacco products containing scores of potential carcinogens such as arsenic, ammonia, hydrogen cyanide and benzene. Nicotine, while addictive, was believed to be harmless. But emerging research is revealing some inconvenient truths about e-cigarettes and the nicotine they deliver. Not only is there evidence that the solvents and other chemicals in e-liquids may play a role in cardiac and pulmonary disease, but also nicotine itself is

emerging as a health hazard. In her research, in collaboration with UCLA infectious-diseases specialist Theodoros Kelesidis, MD (FEL ’11), Dr. Middlekauff has detected a link between the use of e-cigarettes and oxidative stress, a harmful process that adversely affects numerous cellular structures, including proteins, lipids, membranes and DNA. “We have an abstract that we are presenting at an American College of Cardiology meeting that shows chronic electronic-cigarette users exhibit increased levels of oxidative stress as compared to non-users,” she says. “Our data show that these products are causing real changes in immune cells, which is disturbing because not only does oxidative stress increase the risk for cardiovascular disease, it also has been implicated in cancer, lung disease and premature aging.”

“[Adolescents have] been lied to by the e-cigarette industry, which went around saying these products are healthier, safer than cigarettes and are meant for smoking cessation.”

The results reinforce the pressing need for transparency in e-cigarette ingredients, Dr. Middlekauff says. “You get young people who really don’t know what’s in the products they’re using — some of them don’t even know if there’s nicotine or not — and they become addicted very quickly. This is setting them up for lifelong exposure to oxidative stress and inflammation, which is going to get them later,” she says.

At the University of North Carolina (UNC) School of Medicine, researchers also have identified troubling changes in



the lungs of vapers. Robert Tarran, PhD, professor of cell biology and physiology and a member of UNC's Marsico Lung Institute, says these changes are similar to those seen in cigarette smokers. These include elevated levels of proteases, a kind of molecular scissors that cut up other proteins. The link between high protease levels and lung diseases, such as emphysema and COPD, is well-established.

"We found that just the nicotine alone causes the immune cells to release proteases, so clearly there's a potential for lung disease. And now, vaping is attracting a whole new generation who would never have smoked otherwise."



"We found that just the nicotine alone causes the immune cells to release proteases, so clearly there's a potential for lung disease," Dr. Tarran says. "And now, vaping is attracting a whole new generation who would never have smoked otherwise."

Trying to persuade users that their products of choice may, in the long run, not be much better than cigarettes is an uphill battle, Dr. Tarran says. "I've had vapers say that they've been using these products for 10 years without any major effects, so that must mean that vaping is safe. But that's a false argument," he says. "Even with tobacco smoking, if you start smoking when you are 20, you're still pretty healthy by the time you get to 30. It's not until a few decades later, about retirement age, that it gets you."

OVERSIGHT OF THE E-CIGARETTE INDUSTRY IS GEARING UP ON MANY

FRONTS. But a growing number of health care professionals say it's too little too late. A patchwork of state regulations have banned flavored vape liquids and raised the legal age for purchasing vape products. Federal enforcement of restrictions on flavored e-cigarettes kicked in in February. Thanks to a U.S. District Court ruling last summer, manufacturers had until May 2020 to submit their products to the Food and Drug Administration for public-health review. But the flavor ban focuses solely on reusable vape products, such as Juul, which creates some big loopholes. Many in the youth market have already moved on to disposable devices, which continue to sell flavored products with impunity.

Meanwhile, with billions of dollars in profits at stake, Big Tobacco has been buying into the e-cigarette industry. Last year, Altria Group, Inc., the maker of Marlboro cigarettes, purchased a 35 percent stake in Juul for \$12.8 billion. It has joined other tobacco advocates in lobbying lawmakers, often successfully, to loosen, weaken or postpone proposed e-cigarette regulations. At the same time, Juul has pursued a number of prominent physicians and scientists to become its chief medical officer.

The task of helping kids quit vape products often falls to pediatricians like Dr. Hamberger. It can be a heavy lift. "You can talk with them about the science or the health effects that they will face in the future, but that's really not going to get you anywhere," he says. "I've found that the most convincing thing I can tell an adolescent is how this habit is going to affect them today, right now."

Behavioral symptoms, such as sleep disruption, depression, ADHD and poor mood, catch their attention. "When you start getting into the

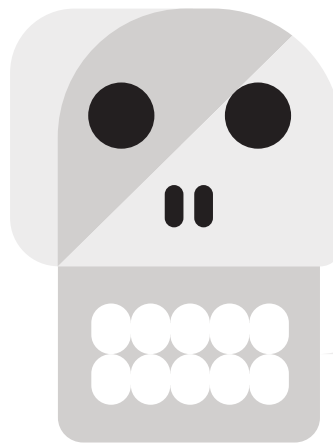
“I didn’t think of myself as a smoker. Like, it’s just a different kind of smoke. The vaping just makes it seem like nothing. Like you’re doing nothing wrong.”

psychological effects of using these products, it tends to scare them,” Dr. Hamberger says. “If you tell a teenager that he or she is not going to feel well emotionally, they tend to listen more.”

With young athletes, who are invested in physical performance, the arguments can be a bit easier to make. “I’ll talk about symptoms like coughing and immune function and shortness of breath, and they kind of raise their eyebrows, and I know that they’re listening,” Dr. Hamberger says. “But, in the end, you’re still talking about the future, about long-term consequences, and that just doesn’t have much of an effect on them at that age.”

All of which comes full circle, back to Simah Herman, the young woman struggling to breathe in the ICU at UCLA. Her path to addiction, her unfettered access to products and her lack of understanding about the potentially grave consequences of vaping exemplify the challenges so many adolescents face .

It was while she was unconscious and on a ventilator that a friend shocked Herman’s mother with the news that her daughter had been secretly vaping since she was 15 years old. She had been able to hide her habit because the vape tech is so small, so easy to use and leaves no telltale odor. Herman began with a random puff or two from friends’ vape devices at school. Then, feeling bad about always borrowing, she began buying her own vapes. Despite her age, she was able to purchase cartridges at smoke shops by claiming to be 22. No one questioned her or checked her ID. Soon, Herman was using a vape cartridge per day, the equivalent of a pack of cigarettes. She also began vaping cannabis, some of it black-market products. After searching her daughter’s room, Herman’s mother returned with a backpack filled with an assortment of vape products.



Later, conscious but still on the ventilator, Herman wrote a sign that she held up to the camera, and then she posted the photo to her Instagram account. “I want to start a no vaping campaign,” it said. While recovering from her ordeal, she shared her story with reporters. “I didn’t think of myself as a smoker. Like, it’s just a different kind of smoke,” Herman told ABC News. “The vaping just makes it seem like nothing. Like you’re doing nothing wrong.”

Then, later, despite her medical ordeal, she admitted how much she still misses vaping. “That’s been the hardest thing,” Herman said. “Staying away from it.”

Veronique de Turenne is a freelance writer in Los Angeles.

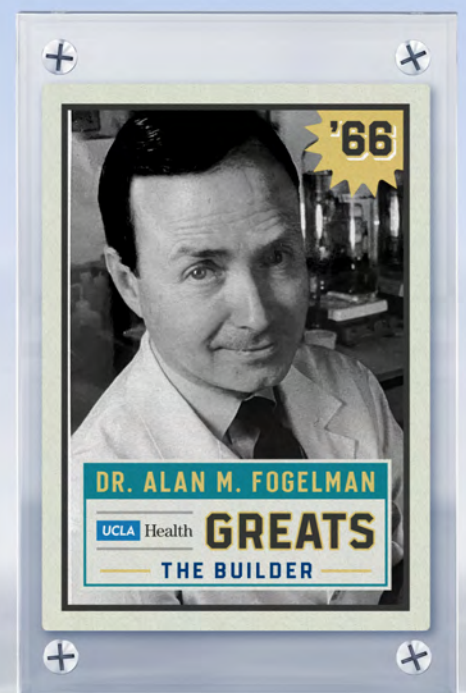
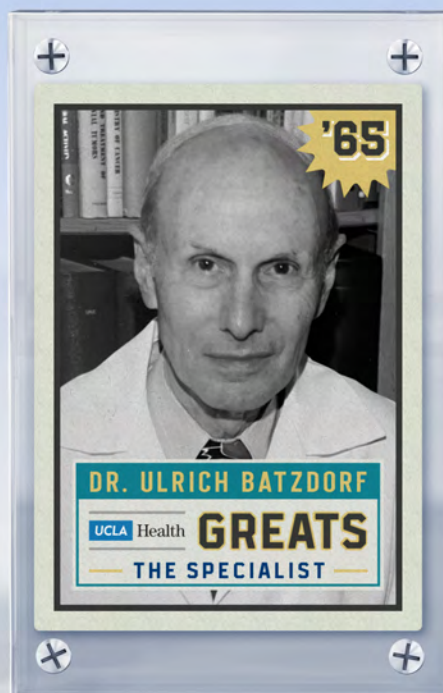


To view an ABC News report about vaping with UCLA patient Simah Herman, go to: tinyurl.com/ucla-vaping

THE LON

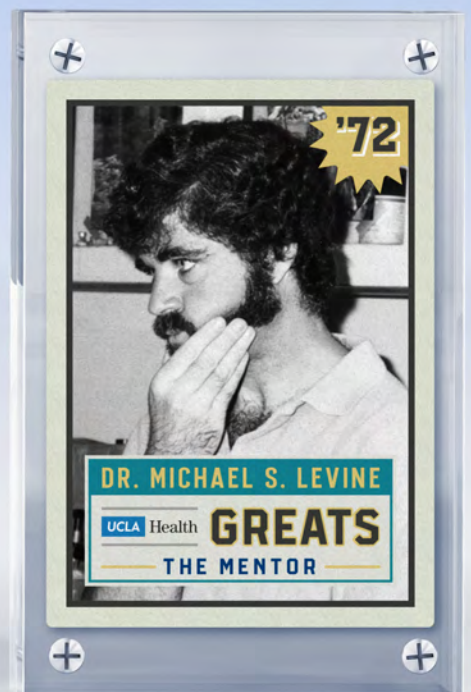
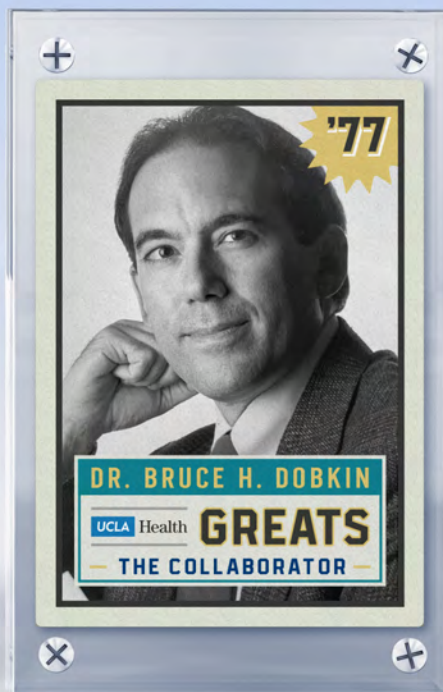
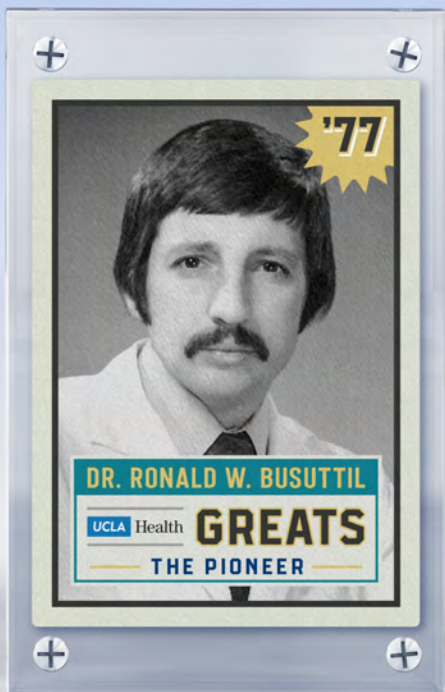
BY NANCY SOKOLER STEINER

PHOTO-ILLUSTRATIONS BY JEFF MANGIAT & WAYNE WATFORD



Longevity is a cornerstone of the careers for many faculty of the David Geffen School of Medicine at UCLA who have found a lifetime of fulfillment here in pursuit of research, teaching and clinical excellence.

GG GAME



In 1964, Lyndon B. Johnson was president of the United States, a gallon of gas cost 30 cents, the Beatles made their American debut on the *Ed Sullivan Show*, Bob Gibson pitched the St. Louis Cardinals to victory over the New York Yankees in Game 7 of the World Series and the UCLA School of Medicine had graduated its first class of doctors just nine years earlier. Also in 1964, three future members of the UCLA medical faculty were pursuing their training here. Alan M. Fogelman, MD '66 (RES '68, '71, FEL '73), was among the school's roughly 270 medical students, and Barbara M. Kadell, MD (RES '68), and Ulrich Batzdorf, MD (RES '65), were residents.

Fifty-six years later, Drs. Fogelman, Kadell and Batzdorf continue to serve as full-time professors or emeriti on the

faculty of what today is the David Geffen School of Medicine at UCLA. Three other faculty members who started their careers at UCLA during the following decade — Ronald W. Busuttill, MD (RES '77), PhD; Bruce H. Dobkin, MD (RES '77), and Michael S. Levine, PhD (FEL '72) — also continue to share their knowledge and clinical expertise.

These six veterans are among more than 60 medical school faculty who still are serving UCLA Health and the school of medicine after more than 40 years on campus. *U Magazine* shares their stories to recognize and honor all of those faculty who have dedicated their careers to teaching and healing at UCLA.



Dr. Barbara M. Kadell: “I was the first woman in the department, and some of the faculty members were not welcoming.”

Photo: David Geffen School of Medicine at UCLA



There were just five women in her class of about 100 students. While the women did not face discrimination, the program was intense and left little room for any activity beyond study.

THE TRAILBLAZER

Dr. Barbara M. Kadell
Professor of Diagnostic Radiology

When Dr. Kadell entered medical school, in 1959, it was during an era when women who wanted a career more often than not found themselves steered toward jobs as secretaries or teachers. So when she was accepted to George Washington University School of Medicine, in Washington, D.C., Dr. Kadell didn't pack much in her suitcase “because I didn't think I was going to last very long,” she says.

By Thanksgiving, however, she realized she was there to stay.

There were just five women in her class of about 100 students. While the women did not face discrimination, Dr. Kadell recalls, the program was intense and left little room for any activity beyond study. “It was just assumed that you would give 120 percent, and that nothing else was going on in your life,” she says.

That is a dramatic difference from today. “Students today have interests [outside of school]. Many of them are married. Some of them have children, which would have been unheard of for us at that time,” she says.

But Dr. Kadell knew that she might someday wish to have a family, and, even though there were few women in the field, she decided to pursue radiology. She and her husband — she married during her internship in Utah — came to UCLA to begin their residencies in 1964. While George Washington University had been relatively accepting of women, UCLA's young medical school was, she found, a more difficult environment.

And, Dr. Kadell was breaking new ground. “I was the first woman in the department, and some of the faculty members were not welcoming,” she

recalls. “They were very upset that I had gotten married between the time I had interviewed and the time I arrived. They were not at all happy about working with me.”

In the face of that resistance, Dr. Kadell found herself taken under the wing of the department’s director of radiology residency programs, Leo G. Rigler, MD. Dr. Rigler was an immense figure in the field who, after 20 years as chair of the radiology department at the University of Minnesota School of Medicine, was known as the “Father of Modern Radiology.” Dr. Kadell and the other four radiology residents in her class were an atypical group. In addition to Dr. Kadell’s groundbreaking presence, there was the department’s first African American and Asian American residents, as well as two older men who had served in the military. (Women are 36.5 percent of UCLA’s current radiology residents.)

Even with Dr. Rigler’s support, “when our residency was over, three of the guys found jobs easily,” but Dr. Kadell and her African American colleague, James Collins, MD, received no offers. “So,” Dr. Kadell says, “Dr. Rigler made sure we were hired at UCLA.” (Like Dr. Kadell, Dr. Collins stayed at UCLA for the duration of his career; he died in 2019.)

But it still was difficult to break through the barriers. Members of the faculty seeking assistance

to review a case “would go straight to a male colleague. It’s like I was invisible,” Dr. Kadell says.

Dr. Kadell worked to make herself invaluable, and her colleagues eventually came around. “They realized I wasn’t going to cry, and I wasn’t going to quit,” she says. “We all got used to each other, and then we all became pals.”

Dr. Kadell has seen vast change to the profession over the course of her career, which included 30 years as chief of abdominal imaging, a position from which she recently stepped down. “I started before ultrasound, CT, MRI and PET. If a patient was sick or had abdominal pain, you didn’t have a CT scan to see that they had appendicitis or diverticulitis. They would need exploratory laparotomies,” she recalls. “Interventional radiology today is just amazing. Abscesses can be drained, tumors can be ablated, all without having to put the patient through surgery.”

There are many factors to which Dr. Kadell attributes her longevity at UCLA: her colleagues, the interactions she enjoys with the many other departments in the medical school, the gratification of teaching the next generations of health care professionals and the enormous resources of an institution as comprehensive as UCLA. But at its core, Dr. Kadell’s greatest enjoyment emanates from the practice of medicine itself. “Every day, I’m blown away by something,” she says.

“They realized I wasn’t going to cry, and I wasn’t going to quit. We all got used to each other, and then we all became pals.”

THE SPECIALIST

Dr. Ulrich Batzdorf

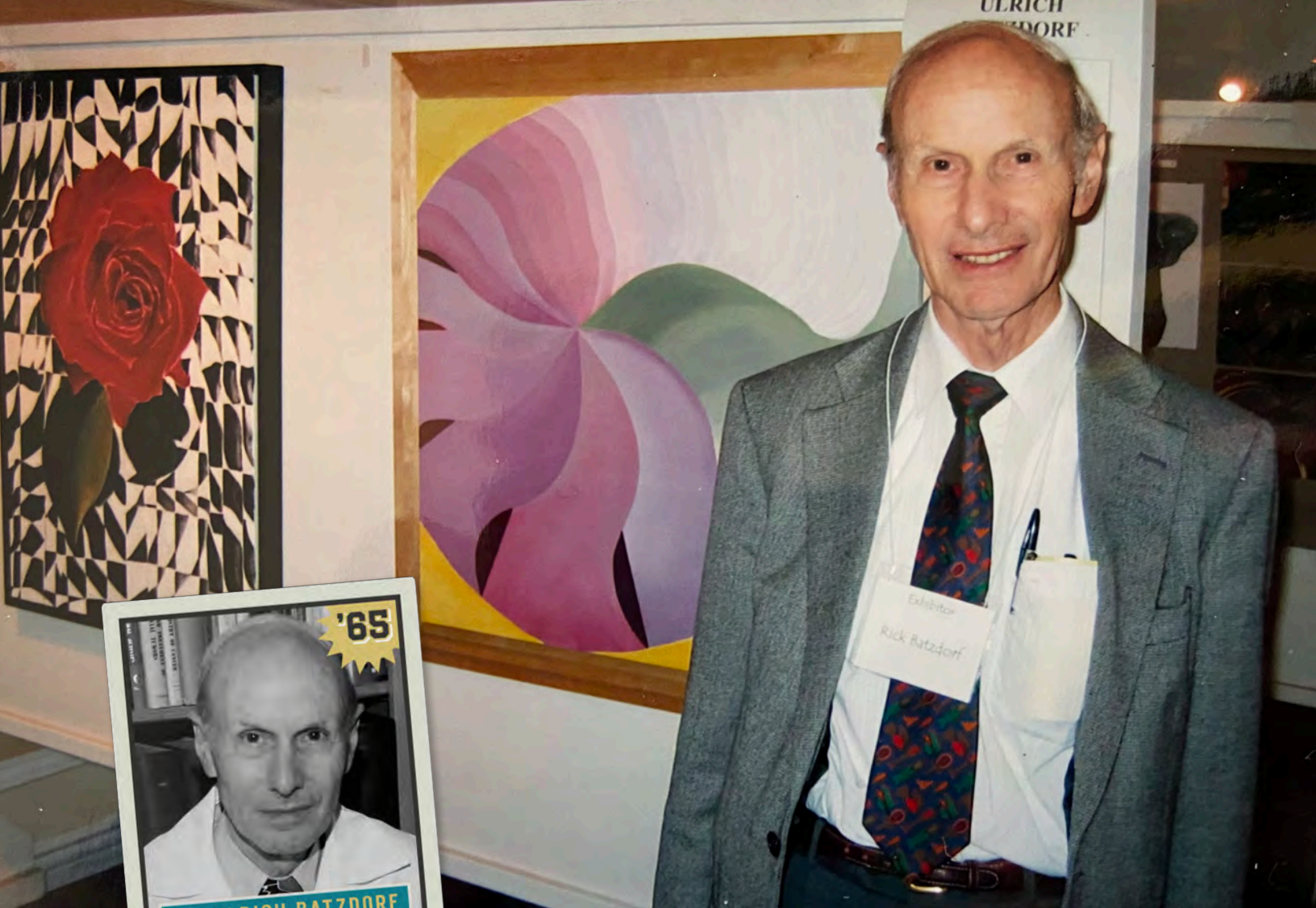
Professor Emeritus of Neurosurgery

Dr. Batzdorf’s early affinity for science came naturally; his father was a urologist and surgeon, and his uncle was a mathematician and physicist. As a medical student at New York Medical College, he leaned toward neurosurgery — “In those days, neurologists had little to do beyond prescribing medicine. I enjoy doing things with my hands,” he says — a choice that crystalized under the tutelage of the renowned surgeon and researcher Isadore Tarlov, MD.

Following medical school, Dr. Batzdorf completed a fellowship in neuropathology at UC San Francisco and then came south to

UCLA for his residency in neurosurgery, training under Eugene Stern, MD, a co-founder of the Department of Neurosurgery. At UCLA, another co-founder of the department, Paul H. Crandall, MD, asked him to participate in a study of cervical spondylosis — age-related changes to the bones, discs and joints of the neck. “That started my focus on the spine,” Dr. Batzdorf says, adding that he particularly enjoyed learning “avant-garde” spinal surgery techniques by another of the department’s co-founders, Robert W. Rand, MD.

Early in his career, Dr. Batzdorf encountered a patient with a condition called syringomyelia. The condition involves formation of a cyst in the spinal cord, which can cause loss of feeling, stiffness, weakness and paralysis. Little at that time was known about the disorder. In a time decades



Dr. Ulrich Batzdorf: "In those days, neurologists had little to do beyond prescribing medicine. I enjoy doing things with my hands."

Photo: Courtesy of Dr. Ulrich Batzdorf

"When I started, there was no CT or MRI, let alone image-guided surgery. The first magnification loupes were available just as I finished residency training. I was the first person in the department to order a surgical headlight."

before the internet, Google or hi-tech imaging technology, Dr. Batzdorf spent hours on the phone, making calls to other medical institutions in the U.S. and around the world to learn more about how to treat the condition. Eventually, Dr. Batzdorf would become one of the nation's top experts in the treatment of syringomyelia and an often-related condition, Chiari malformation.

Dr. Batzdorf, too, has seen major changes in medical practice over the course of his career. Like Dr. Kadell, Dr. Batzdorf says that "when I started, there was no CT or MRI, let alone image-guided surgery. The first magnification loupes were available just as I finished residency training. I was the first person in the department to order a surgical headlight."

Surgical techniques also have dramatically changed since Dr. Batzdorf first began. Rather than employing large, open incisions, more surgeries are being done with minimally invasive techniques that utilize internal cameras and tiny instruments inserted through small cuts.

"One of the biggest changes I've seen in terms of spinal surgery is the development of implants," he adds. "The plates, rods, screws and hooks that we use routinely today didn't exist when I started in the field," he says.

Dr. Batzdorf currently is an emeritus professor on recall. He loves his work, and he says that he plans to continue for as long as he remains in good health. "I find it stimulating. I enjoy my colleagues. I like teaching, working with patients and sorting out problems," he says.

THE BUILDER

Dr. Alan M. Fogelman

*Professor of Medicine and Cardiology and
Chair of the Department of Medicine*

Dr. Fogelman is a lifelong Bruin. He arrived on campus as a freshman in 1958 and stayed to earn his MD and complete his internships, residency and fellowship training. He even met his wife at UCLA, in the Biomedical Library; they will celebrate 56 years of marriage in June.

When he was chief resident in the Department of Medicine, Dr. Fogelman worked in the lab of George Popják, MD, a pioneer in the study of the biosynthesis of cholesterol. It is a subject that Dr. Fogelman continues to investigate today, as he looks at the main protein in HDL — so-called good cholesterol — and its role in preventing inflammation.

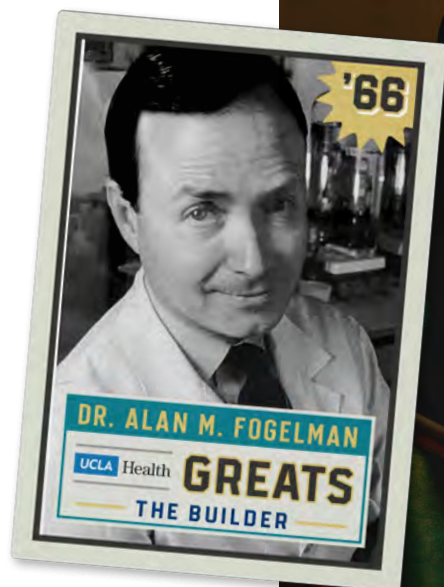
In 1992, Dr. Fogelman was named chair of the Department of Medicine, and he immediately set out to sharpen the school's focus to advance in primary care. At that time, only two of the department's 200 faculty members practiced in that field. Spurred by a dearth of primary care physicians statewide, Dr. Fogelman worked with his colleagues to transform UCLA into a premier training center for primary care physicians. He recruited primary care physicians who worked in Westwood and mentored them in taking on the teaching, research and leadership roles required of faculty physicians.

"I really believe that the best care for an individual is care that is coordinated, and that if you have a good general internist or family physician who is well-trained and provides most of your care, you are better off," Dr. Fogelman says. It was a Herculean effort, for which hospital and school of medicine leadership called Dr. Fogelman "a medical visionary" and

compared him to a great athlete who "knows before everyone else what changes are going to occur."

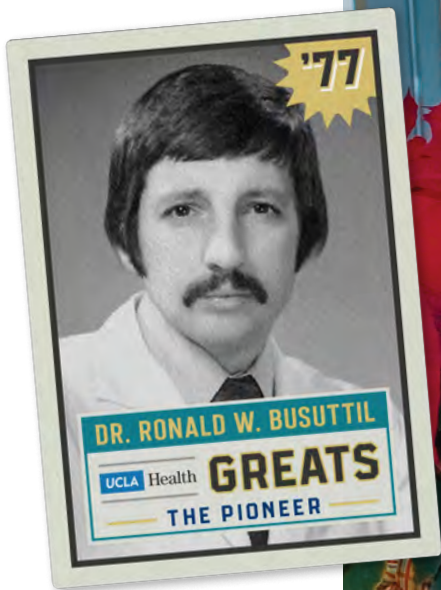
In addition to building a robust primary care faculty, Dr. Fogelman recruited specialty care physicians to work with primary care doctors in the community. Today, the Department of Medicine has about 100 primary care internists on its faculty, and UCLA Health has more than 180 primary and specialty care community clinics throughout Southern California. "Trying to figure out how to deliver health care today is challenging, and it is satisfying when we make progress and can bring high-quality, high-value health care into the communities around us," he says.

"Trying to figure out how to deliver health care today is challenging, and it is satisfying when we make progress and can bring high-quality, high-value health care into the communities around us."



Dr. Alan M. Fogelman: "I really believe that the best care for an individual is care that is coordinated."

Photo: Jessica Pons



Dr. Ronald W. Busuttill (with transplant patient Lily Mandel Allen): “We have grown tremendously since that first patient in 1984. But our fundamental mission — saving lives — has not changed.”

Photo: Moses Sparks

The reach of the program that Dr. Busuttill has built at UCLA extends far beyond Westwood. Two years after that first transplant, Dr. Busuttill trained his first fellow. Thus far, 80 liver-transplant fellows have been trained at UCLA.

THE PIONEER

Dr. Ronald W. Busuttill
*William P. Longmire, Jr. Chair in Surgery and
Executive Chair of the UCLA Department of Surgery*

It was 1982, and Dr. Busuttill was just five years out from having completed his residency in surgery at UCLA. He had performed a procedure called a distal splenorenal shunt on a patient who was bleeding due to liver disease. The operation was successful, but the patient later went into liver failure. Dr. Busuttill hurriedly made arrangements for the patient to be transferred to the University of Pittsburgh, where the groundbreaking surgeon Thomas E. Starzl, MD, PhD, was advancing the nascent field of liver transplantation. Unfortunately, the patient died before he could be flown to Pittsburgh.

That should never have happened, Dr. Busuttill says. “I said to my colleague, Dr. Leonard Goldstein, who was a hepatologist at that time and helped me with all these cases, ‘Lenny, it’s time to do liver transplants at UCLA.’”

Achieving that goal would be no simple matter. The science of transplantation was in its infancy, and Pittsburgh’s was the only significant liver-transplant program in the country at the time. “I had support

from [Department of Surgery Chair] Dr. William P. Longmire, Jr. and our dean, Dr. Sherman M. Mellinkoff, but there were some in the administration who were not supportive,” Dr. Busuttill recalls. “There was skepticism even in the medical community, since liver transplantation was so rare.”

Dr. Busuttill went to Pittsburgh to spend several weeks training with Dr. Starzl. Back at UCLA, he assembled a surgical team and went into the lab to refine his technique by performing transplants in pigs, as their liver anatomy closely resembles that of humans.

After performing 50 transplants in animal models, on February 1, 1984, Dr. Busuttill and his team performed the first human liver transplant at UCLA. The procedure was a success, and the program took off, establishing the first viable liver-transplant center west of the Mississippi. The team performed 22 liver transplants in the first year. Today, UCLA’s surgeons have performed nearly 7,000 procedures, with a success rate close to 90 percent. UCLA also became one of the leading U.S. centers in performing split-liver transplantation, a technique in which a single liver is divided and transplanted into two patients, as well as being among the first to do live-donor liver transplants.

The reach of the program that Dr. Busuttill has built at UCLA extends far beyond Westwood. Two years after that first transplant, Dr. Busuttill trained his first fellow. Thus far, 80 liver-transplant fellows have been trained at UCLA, many of whom have gone on to head their own programs, including at major centers like the University of Chicago, Massachusetts General Hospital, University of Pennsylvania, Baylor, the University of Wisconsin and Johns Hopkins University. In 1994, just 10 years after it started, the UCLA Liver Transplant Program surpassed Pittsburgh's to become the busiest liver-transplant center in the country.

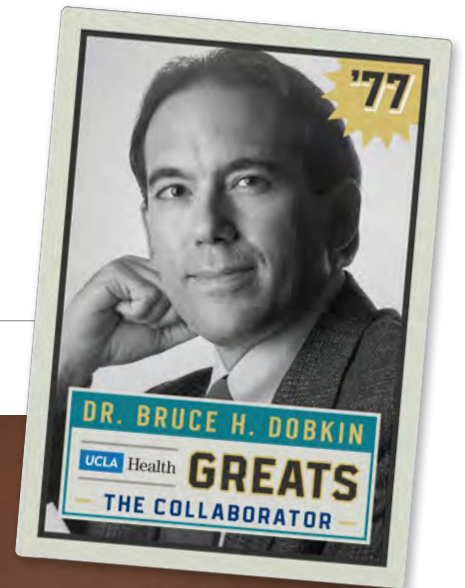
Dr. Busuttill came to UCLA in 1971 for his surgical internship, after earning his MD from Tulane University in New Orleans, Louisiana. He went back to Tulane for a PhD in pharmacology, and then returned to UCLA for his residency, becoming chief resident in 1977. He joined the faculty the following year. "I knew UCLA was rated one of the top surgery programs in the country," he says. "Dr. Longmire had a very, very important influence on me, and there's no way I wanted to leave." Dr. Busuttill has, for the past

16 years, held his mentor's position as chairman of the Department of Surgery.

Dr. Busuttill continues to stay in touch with many of his former patients. One of them was 14 months old when he operated on her, a child from Arizona whose liver was so filled with tumors that it caused her abdomen to swell to four times its natural size. Hers would be only the ninth transplant that Dr. Busuttill had performed, but "no one else would touch the case," he recalls. Now, 36 years later, she is a grown woman, and in his office, Dr. Busuttill has a photograph of her in a wedding dress, taken in 2008, and another from 2011 of her surfing. There are more photos — including one of a young couple with a baby; they met at UCLA, after receiving liver transplants, and now have two children.

"We have grown tremendously since that first patient in 1984," Dr. Busuttill says. "But our fundamental mission — saving lives — has not changed."

"I knew UCLA was rated one of the top surgery programs in the country. Dr. Longmire had a very, very important influence on me, and there's no way I wanted to leave."



THE COLLABORATOR

Dr. Bruce H. Dobkin
Professor of Neurology

Dr. Dobkin likens UCLA to the nervous system: Both involve specialized regions and subregions, and both are characterized by myriad interconnected strands. The whole cannot work without the interconnectedness of its parts, and Dr. Dobkin considers collaboration to be essential to both the university's and his own success. By his estimate, he has worked with colleagues in almost every school on the UCLA campus.

The sharing of ideas even influenced Dr. Dobkin's choice of careers. At Hamilton College in upstate New York, where the motto is "Know Thyself," he was torn between the pursuit of writing and medicine. In a conversation with a visiting professor, Alex Haley (who would go on to write *Roots*), the author urged Dr. Dobkin to pursue the latter. Medicine, Haley said, would give him fodder



Dr. Bruce H. Dobkin: "Every generation of researchers believes that discoveries will soon apply to their patients. And, eventually, they will."

Photo: Jessica Pons

“The intricacy of the nervous-system pathways is much greater than we could have imagined. The science grows more complex as research digs deeper and wider.”

for writing. (Dr. Dobkin did, in fact, go on to write about doctoring for the *New York Times Magazine*, *Life* and other publications, as well as authoring the book *Brain Matters: Stories of a Neurologist and His Patients* [Crown Publishers, 1986].)

Dr. Dobkin earned his MD at Temple University, in Philadelphia, Pennsylvania, and came to UCLA for an internship in internal medicine. “This is paradise,” thought the Pennsylvania native, as he ate his lunch on the grass at UCLA’s Franklin D. Murphy Sculpture Garden on his first visit. He completed his residency in neurology and became interested in cerebrovascular disease and stroke. Dr. Dobkin developed UCLA’s first stroke program in the 1980s, and then helped to found, in 1994, today’s UCLA Comprehensive Stroke Center, which is one of the world’s leading centers for clinical care and research in cerebrovascular disease.

A significant focus of Dr. Dobkin’s clinical research is on spinal-cord injury. It is something with which he has personal experience; in 1995, his brother Craig, an experienced climber and experiential educator, slipped off the edge of a cliff in Wisconsin while setting up a challenge course for a client and landed on rocks 80 feet below. His spine was severely injured and his legs became paralyzed. Dr. Dobkin became a key advocate and participant in his brother’s recovery. As he explained in a *Los Angeles Times* article in 1999, the experience “allows me to empathize with families of patients with spinal-

cord injuries. I tell them about Craig, and for many I think it’s reassuring.”

Dr. Dobkin’s interest in spinal-cord injury and rehabilitation has translated into the establishment of UCLA’s Neuro-Rehabilitation Program. The program, which pursues research and therapies to treat such conditions as stroke, brain and spinal-cord injury, multiple sclerosis and Parkinson’s disease, moved its inpatient and outpatient services in 2017 from Westwood to a 138-bed facility, the California Rehabilitation Institute, in Century City.

In addition to developing advanced rehabilitation therapies to help paralyzed patients regain mobility, Dr. Dobkin is interested in pursuing neurotrophic drug and cellular treatments to regenerate spinal-cord nerve cells. To advance that pursuit, he has been instrumental in creating the UCLA Integrative Center for Neural Repair, which now is part of the UCLA Brain Research Institute.

When he and colleagues created the neuro-rehab program, in the late 1980s, Dr. Dobkin predicted that interventions to promote neural repair would occur within the following decade. It now has been 35 years, and achieving that goal remains elusive. “The intricacy of the nervous-system pathways is much greater than we could have imagined,” Dr. Dobkin says. “The science grows more complex as research digs deeper and wider. Every generation of researchers believes that discoveries will soon apply to their patients. And, eventually, they will.”

THE MENTOR

Dr. Michael S. Levine
*Distinguished Professor of Psychiatry and
Biobehavioral Sciences and Vice Chancellor
for Academic Personnel*

Dr. Levine may be the only research scientist at UCLA who can both operate a lathe and knows how to cast molten metal. These are skills that he learned as a student at Brooklyn Technical High School, where he thought about pursuing a career in industrial design.

He took a different path when he entered college and majored in psychology. Immediately after

earning his PhD in physiological psychology from the University of Rochester, Dr. Levine came to UCLA as a postdoctoral fellow to work in the lab of the internationally recognized neuroscientist Nathaniel A. Buchwald, PhD, and his longtime collaborator Chester Hull, PhD. Their research focused on the basal ganglia, an area of the brain involved in the control of movement. Dr. Levine stayed at the lab after receiving his appointment as an assistant professor and continued the work, following the retirement of Drs. Buchwald and Hull in the early 1990s.

“We still study the basal ganglia in both health and disease,” Dr. Levine says. “We concentrate now

on studying models of Huntington's disease, which is a devastating genetic disorder. We are looking at what happens to brain cells and how their communication is altered as the disease progresses."

Dr. Levine's early background in industrial arts and knowledge of mechanics and electronics came in handy when he worked in the lab, enabling him to troubleshoot myriad technical problems as they arose.

Though he is known to many who admire his research as "a scientist's scientist," at the core of Dr. Levine's career is a deep love of teaching. In an article that was published in 2019 in a special issue of the *Journal of Neuroscience Research* to celebrate Dr. Levine's 75th birthday, Carlos Cepeda, PhD (FEL '86), his longtime collaborator and co-principal investigator in the lab, wrote: "Mike's career as a teacher began in parallel to his research, and it is difficult to tell which part of his job he loves more. ... His pedagogic skills are unsurpassed." No matter how complex the science, "Mike could make it simple and understandable." During one talk, someone in the audience called out, "You chose the wrong profession. You should have been a preacher!"

Dr. Levine is particularly fond of teaching first-year undergraduate students who are interested in neuroscience. It is a rare pursuit for a member of the medical school faculty; he currently co-teaches in one quarter of a cluster course for undergraduates entitled "Mind Over Matter: The History, Science and Philosophy of the Brain." "These students are just beginning to learn about how the brain works, and it is a pleasure for me to see them become enamored with the subject," he says.

These days, Dr. Levine is spending more time on his administrative leadership role. Throughout his career, he has served in various administrative positions, including as associate director of the Intellectual and Developmental Disabilities Research Center, chair of the Undergraduate and Graduate Interdepartmental Programs in



Dr. Michael S. Levine: "In a job like this, you can build programs that help faculty advance, and we've done that."

Photo: Courtesy of Dr. Michael S. Levine

Neuroscience, associate chair of the Department of Psychiatry and Biobehavioral Sciences, special assistant to two vice chancellors for academic personnel and, now, vice chancellor for academic personnel for the UCLA campus.

Being in a role that supports faculty in their growth and progression is fulfilling for him. "In a job like this, you can build programs that help faculty advance, and we've done that. We've enhanced mentoring programs for junior faculty and have begun to develop a program to help associate professors."

When not engaged with his campus duties, Dr. Levine has found time to hike, ski and kayak. His favorite activity, however, remains taking annual expeditions to photograph wildlife and endangered species around the world. His travels have taken him from Antarctica to the Svalbard Islands in the Arctic, from Alaska to Tanzania and from Yellowstone to Borneo. The pursuit is not without risk. "One time," Dr. Levine says, "I was knocked over and stepped on by a mountain gorilla."

Nancy Sokoler Steiner is a freelance writer in Los Angeles. She frequently writes about faculty for *U Magazine*.

"Mike's career as a teacher began in parallel to his research, and it is difficult to tell which part of his job he loves more. His pedagogic skills are unsurpassed."



It took Dr. Colin McCannel years to train for and then 12 hours 18 minutes and 13 seconds to swim the 20 miles between Catalina Island and Palos Verdes, where he came ashore at Smuggler's Cove.

Photo: Terence Young Images

Aqua Man

By Robin Keats

Stars glitter in the midnight sky as a lone swimmer cuts through the dark waters of the Catalina Channel, one arm rhythmically rising through the swell as another descends. Sharks also swim in these waters, but Colin McCannel, MD (RES '95, FEL '98), considers the possibility of being hit by another car while driving on the 405 to be a much greater risk.

As Dr. McCannel, professor of clinical ophthalmology at UCLA Stein Eye Institute, closes the distance between Catalina Island and the Palos Verdes Peninsula — some 20 miles — a manned kayak follows nearby, just in case of an emergency. On board a dive boat not far away, a friend videotapes Dr. McCannel's slow crawl through the chilly water. Before beginning his swim, Dr. McCannel is heard on the video to say, with a laugh: "It seemed like a good idea. Now it seems like a stupid idea." At around 10:45 pm, he enters the water at the edge of Catalina's Doctor's Cove, turns to face the camera and raises his arms, and a companion proclaims: "What an adventure we're about to have!"

The swim took place in September 2019. "The fun of swimming was intermittently replaced with worry," Dr. McCannel says. The current was strong and the water choppy. "Will I make it if it stays like

this or gets worse? Go away bad wolf! Hush! I kept swimming." He swam to the rhythm of Queen's anthem "We Will Rock You" playing on a continuous loop in his head.

Now that he's completed the Catalina crossing — "When it was over, I thought, 'Wow, it's done already? I still feel great.' When I got home, I slept for 14 hours!" — Dr. McCannel's sights are set on one day swimming the English Channel. "My wife's been tolerant, but she is not anxious for me to do it any time soon," he says. "Maybe a swim to Anacapa Island — a mere 12 miles — will be next."

Dr. McCannel spent three years building a "base" with intense swim training before training for six months specifically for the channel crossing. By the time he came ashore around 11 am at Smuggler's Cove, it had taken 12 hours 18 minutes and 13 seconds to complete, according to the unofficial time posted by the Catalina Channel Swimming Federation. That might seem to many people like a perilous undertaking. But Dr. McCannel says the challenge of pitting himself against the sea lightens his mind and elevates his spirits. "I've always enjoyed the vastness of the ocean, of being such a tiny part of its massive expanse," he says. "You see nothing but water as you swim. It's so tranquil."

There are parallels between Dr. McCannel's passion for long-distance swimming and his role as an ophthalmic surgeon. The same focus and determination are as necessary to cross a large body of water as they are to repair the delicate structures of the eye. And there is uncertainty in both endeavors.

“As a surgeon, you must maintain your composure in a sometimes very stressful, imperfect situation. I perform micro-surgery. Being nervous is not an option; you can’t do surgery when you’re shaking,” he says. The same is true in the water, where it sometimes is necessary to react quickly to sudden changes.

DR. MCCANNEL COMES FROM A FAMILY OF PHYSICIANS. He is the son of a urologist, the stepson of a family practitioner, the nephew of an ophthalmologist and the husband of another ophthalmologist, Tara McCannel, MD, PhD, director of the Ophthalmic Oncology Center at UCLA. As an undergraduate, he thought about becoming a chemical engineer, but he wanted more social interaction in his professional life. He attended medical school at the Mayo Clinic in Rochester, Minnesota, and came to UCLA for his residency before returning to Mayo. He joined the UCLA faculty in 2008.

Dr. McCannel had been a runner before a torn meniscus prompted him to switch to swimming. “It’s really a nice outlet from the stress of my job,” he says. “When you start approaching mid-life, as I was when I began to train for marathon swims, you realize your body is starting to deteriorate. I thought about what I could do to slow that down as much as possible.”

While swimming has proven to be a great stress reliever, Dr. McCannel says he is not sure what it is that motivates him in his long-distance pursuits.

“I can’t explain why I do this, but throughout my life, even as a child, whenever I’ve been on a coast and there was an island, I thought it would be cool to swim to it,” he says. “I never acted upon it, and when I first heard about people taking on such challenges, there was no thought on my part that I’d ever do it. But then I met some people who had done it, and I thought if they could, I should be able to, too.”

There’s a triple crown of marathon swimming: Catalina Channel, the English Channel and a swim around Manhattan. “I’m not planning on completing the other two anytime soon,” he says. His voice is somewhat wistful, but the look in Dr. McCannel’s eyes suggests that just might be what the future holds.

Robin Keats is a freelance writer in Los Angeles.



To view a video of Dr. Colin McCannel’s Catalina Channel swim, go to: tinyurl.com/mccannel-catalina



“When it was over, I thought, ‘Wow, it’s done already? I still feel great.’ When I got home, I slept for 14 hours!,” says Dr. McCannel, who was accompanied throughout his swim by a kayak and boat.

Photos: Terence Young Images

Awards & Honors

Keriann Backus, PhD, assistant professor of biological chemistry, was selected for the Alexander and Renee Kolin Endowed Professorship of Molecular Biology and Biophysics.

Dr. Helen Lavretsky, MD (RES '95, FEL '96), professor-in-residence of psychiatry and biobehavioral sciences, received the Award for Research from the American College of Psychiatrists, the Weinberg Award for Research in Geriatric Psychiatry from the American Psychiatric Association and the Distinguished Scientist Award from the American Association for Geriatric Psychiatry.

Dr. James McGough, MD (FEL '91), co-director of the ADHD Clinic at the Stewart and Lynda Resnick Neuropsychiatric Hospital at UCLA, received the Elaine Schlosser Lewis Memorial Award for Research on Attention Deficit Disorders from the American Academy of Child and Adolescent Psychiatry.

Dr. Kalyanam Shivkumar, MD (FEL '99), PhD, professor of medicine and director of the UCLA Cardiac Arrhythmia Center, was named the editor-in-chief of the journal *JACC: Clinical Electrophysiology*. The journal encompasses all aspects of the epidemiology, pathogenesis, diagnosis and treatment of cardiac arrhythmias.

In Memoriam

Dr. William E. Cunningham, professor of medicine and public health, died January 3, 2020. He was 60 years old. Dr. Cunningham was a national leader in studies designed to improve outcomes along the HIV-care continuum. He completed his residency training at UCLA and was selected into the 1991 cohort of the UCLA Robert Wood Johnson Clinical Scholars Program. He taught graduate-level courses on racial disparities and health, health-services organization and outcomes and effectiveness research. Dr. Cunningham was instrumental in mentoring hundreds of trainees, most of who were from underrepresented minority groups aspiring to enter the medical and/or public health professions.

Dr. Howard Ronald Kaback, Distinguished Professor in the Department of Physiology and the Department of Microbiology, Immunology & Molecular Genetics, died December 20, 2019. He was 83 years old. Dr. Kaback joined the UCLA faculty in 1989 as a Howard Hughes Medical Institute investigator and professor. Dr. Kaback’s contributions to science have been recognized by many honors and awards, including election to the National Academy of Sciences and as a Fellow of the American Academy of Arts and Sciences, receipt of the Peter Mitchell Medal and delivery of the Harvey Lecture.

Philanthropic Giving Aids UCLA Clinicians Combating Covid-19



UCLA Health employees (from left) London Brookins of patient transport, security officer Raul Alvarado Hernandez, Miguel Castro of patient transport, Ernest Kirton of patient transport and Roemello Lee of patient transport receive a donation of N95 masks from Tesla.

Photo: Patty Coria

The Greater Los Angeles community has joined together to support health care professionals at UCLA's four hospitals and 180 clinics throughout Southern California, as they treat patients and families affected by COVID-19. To date, UCLA Health and the David Geffen School of Medicine at UCLA have received more than \$3 million from two anonymous donors, one of whom gave the lead gift toward the purchase of 35 new ventilators to treat the most serious cases of COVID-19. As of May 1, additional cash donations have brought the total COVID-19 philanthropy to more than \$14 million. As the global pandemic continues, gifts received after *U Magazine's* press date will be highlighted in the next issue.

While the city sheltered in place, UCLA physicians, nurses, respiratory therapists and staff delivered the exceptional care that has earned UCLA Health its distinction as a world-class health care provider. Across the campus, collaborations led to innovations to meet overwhelming demand for personal protective equipment (PPE), such as the creation of face shields using 3D printing. Shirley and Walter Wang donated rolls of rigid plastic sheeting that the university will use to make as many as 44,500 reusable face shields for UCLA Health clinicians on the frontline of the COVID-19 response. Shirley is a UCLA alumna, UCLA Foundation director and its past chair; Walter is chairman and CEO of JM Eagle Inc., the world's largest manufacturer of plastic and PVC pipe.

Children, too, stepped forward to make a contribution toward meeting this challenge. A group of students collected 750 surgical masks that they delivered to at a UCLA Health collection center in Van Nuys. Their donation came with a note written by an eighth grader: “Thank you so much for all your effort during this pandemic. I cannot possibly imagine what you’re going through, and I am so grateful for all of it.”

Concurrently, UCLA scientists ramped up research to develop an effective way to test for COVID-19. Gifts also provided resources to the David Geffen School of Medicine at UCLA for research to determine the pathogenesis of COVID-19 and pathways to overcome it. One anonymous donor funded a study on immune response in survivors in the hope of expediting an effective treatment or cure.

Goldman Sachs made an unsolicited donation of 25,000 surgical masks and 3,000 N95 respirators (PPEs that cover the nose and mouth and reduce the wearer’s exposure to at least 95 percent of small particle aerosols and large droplets). Additional inspired philanthropists at every level stepped forward to provide vital funds and equipment to support health care professionals on the frontline of patient care. The Los Angeles Unified School District donated 100,000 N95 masks, and Tesla, Inc., donated tens of thousands of N95 masks. In addition, the Getty Center and Getty Villa donated all of the available PPE (goggles, gloves, masks) from their art restoration labs.

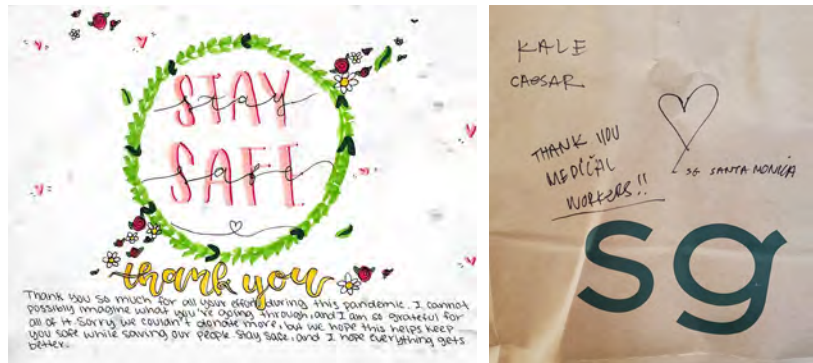
Other contributions include \$1 million toward equipment from an anonymous donor; \$1 million, in an effort led by a UCLA faculty member, to support patient care; and \$250,000 from the Los Angeles Lakers toward PPE and needed equipment.

In response to the multiple requests for ways to help, UCLA created two funds to channel philanthropy to the most urgent needs of UCLA Health and the David Geffen School of Medicine at UCLA: the COVID-19 Patient Care and Healthcare Provider Protection fund and the COVID-19 Coronavirus Research and Education fund.

Dr. Owen Witte, director of the Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research at UCLA, and his wife Jami, a research specialist in microbiology, immunology, and molecular genetics at UCLA, rapidly responded to the need and gave a gift of more than \$500,000 to the Covid-19 Patient Care and Healthcare Provider Protection fund, saying, “It was prompted by both my wife and me being members of the UCLA community for over 40 years and wanting to support our health center at a time of incredible need.”

In response to multiple offers to provide food for frontline staff, UCLA established the #TeamLA: UCLA Health Gift Card Drive to support the well-being of health care workers. Donations to this drive enable UCLA Health to purchase \$25 gift or gas cards or add to BruinCards that can be used at local stores and restaurants to ease the burden on health care providers.

A \$200,000 donation was made to help offset the cost of cafeteria meals for staff working in the hospitals. In addition, Help Feed the Frontline Fighting COVID-19 in Los Angeles, in partnership



Top: Shirley Wang (left), with her husband Walter, wears a sample reusable face shield manufactured by UCLA that was made possible through their gift. **Middle and Bottom Left and Right:** Donations to support UCLA Health in its fight against COVID-19 included personal protective equipment from large organizations and individuals in the community, as well as meals to frontline care givers from restaurants like Sweet Greens.

Photos: (Wang) Courtesy of the Wang family; (warehouse) Reed Hutchinson; (note, Sweetgreens) UCLA Health

with World Central Kitchen, began providing 800 meals per day, three times a week, divided equally between UCLA Medical Center, Santa Monica and Ronald Reagan UCLA Medical Center.

 **For more information, contact Ellen Haddigan-Durgun at:** 310-206-3878

 **To support UCLA’s COVID-19 response, go to:** uclahealth.org/Giving/covid-19-philanthropic-support

COVID-19 Patient Care and Healthcare Provider Protection fund
uclahealth.org/Giving/covid-19-patient-care

COVID-19 Coronavirus Research and Education fund
tinyurl.com/research-and-education-fund

 **To make a donation of PPE, email:** COVID19PPESUPPORT@mednet.ucla.edu

A Garden of Memories



Left: (From left) Bob Clearmountain, Betty Bennett and Bennett's daughter Alexandra Jackson with their dog. **Center:** Betty Bennett (left) with Dr. Brandon Koretz. **Right:** Johnese Spisso (left) and Betty Bennett.

Photos: Jessie Cowan

On November 20, 2019, family and friends of **Betty Bennett and Bob Clearmountain**, along with UCLA faculty members, gathered at UCLA Medical Center, Santa Monica to celebrate the opening of the Dolores Bennett Shade Garden in memory of Bennett's late mother Dolores and the philanthropy of Bennett and Clearmountain.

The generosity of Bennett and Clearmountain will provide support for multiple areas and services at UCLA, including the UCLA Division of Geriatrics and Dr. Brandon Koretz (RES '99, FEL '00), division co-chief and James and Carol Collins Chair in Geriatric Medicine; UCLA People-Animal Connection (PAC), UCLA Health's animal-assisted therapy program that provides more than 12,000 patient visits per year; and No One Dies Alone, a hospital program that ensures compassion and reassurance for patients as they pass. It also will fund the UCLA Health President's Fund for Greatest Needs, which provides care for UCLA's neediest patients.

"The Dolores Bennett Shade Garden is a peaceful respite for everyone at UCLA Medical Center, Santa Monica," said Johnese Spisso, president of UCLA Health, CEO of the UCLA Hospital

System and associate vice chancellor of UCLA Health Sciences, in her opening remarks. "It is named in loving memory of Betty's mother, and we are grateful for the vital support of our patient-care programs from Betty Bennett and her husband Bob Clearmountain. We are delighted to celebrate their support while honoring Dolores's legacy of kindness."

Dr. Koretz shared his heartfelt memories about Dolores, as well as, Betty and Bob, and he thanked the couple for their support of UCLA Geriatrics. Bennett then spoke and, together with Clearmountain, unveiled the memorial plaque in the garden.

"Our family is grateful to UCLA for its caring approach to patients and families," said Bennett. "From Dr. Koretz's warmth in leading the geriatrics program to the canine companionship of the PAC dogs, kindness is key. I know my mom would be happy knowing there's a garden in her memory at the hospital that patients, visitors and staff can enjoy always."



For more information, contact Ellen Haddigan-Durgun at: 310-206-3878

UCLA Health Receives \$18 Million Gift to Expand Whole-person Care for Patients and Families Facing Cancer

The Simms/Mann Family Foundation, led by Dr. Victoria Mann Simms and Ronald Simms, has made an \$18 million commitment to support UCLA's expansion of integrative psychosocial care for people with cancer and their families into communities throughout Southern California.

The gift to UCLA Health will fund an endowment to sustain and expand the Simms/Mann-UCLA Center for Integrative Oncology, which provides psychosocial care — usually free of charge — to patients and families dealing with the emotional, psychological and physical burdens of cancer and its treatment. It is the lead gift in a new campaign by UCLA Health to create a \$50 million endowment for the center.

Psychosocial treatment at the center involves a wide range of individual, family and group therapy — not only psychiatric care, but also educational programs in nutrition, spiritual care, qi gong and meditation, as well as workshops on healing through art and preparing for surgery. The center's mission is to empower patients and families with support that enhances their overall well-being as they go through the many challenges of a cancer diagnosis.

"This is truly an exciting and timely opportunity to inspire and train patient-centered leaders and professionals to work together to transform the delivery of cancer care to our communities," Dr. Vicki Simms said. "This partnership with UCLA reflects our mutual belief: Everyone should have access to excellent health care services that focus on the whole person."

The Simmses learned firsthand about the struggles that face cancer patients and their families when Dr. Vicki Simms's father Ted Mann suffered from cancer and was treated at UCLA. The Simmses have long been passionate about advancing integrative medicine, an approach that cares for the patient as a whole person: mind, body and spirit. Their 20-plus years of national experience on the topic was the catalyst for funding the Simms/Mann-UCLA Center for Integrative Oncology and creating the Simms/Mann Health and Wellness Center at the Venice Family Clinic, the first integrative-medicine center at a free clinic.

In the years since its inception, the Simms/Mann-UCLA Center has grown to become a nationally recognized model for integrative oncology care. Center director Dr. Kauser Ahmed



Dr. Victoria Mann Simms and Ronald Simms.

Photo: Brian Liebman

also oversees the center's acclaimed training program that prepares providers from across the United States in integrative psychosocial care.

The endowment will enhance that training program, strengthen patient care at UCLA Health facilities in Westwood and Santa Monica, expand the center's psychosocial and integrative services into UCLA's community oncology clinics, create the Simms/Mann Family Foundation Chair in Integrative Oncology and endow a chaplaincy in honor of Dr. John Glaspy (MD '79, RES '82, FEL '83), the center's medical director and a member of the UCLA Jonsson Comprehensive Cancer Center.

"The center's invaluable work relies on public-private partnership," said Ron Simms, a California real estate developer. "UCLA has the clinical footprint and expertise to deliver counseling alongside its best-in-class cancer care. We are grateful for UCLA'S commitment to expand access to care, enabling patients and families to receive services close to home from a truly integrated team of professionals."

To inspire other philanthropists to support the center, the foundation's commitment includes a gift-matching fund of \$6 million. Combined with its generous previous gifts, the foundation now has given more than \$33 million to UCLA.

"For decades, the Simms-Mann family has been a tireless advocate for a team approach to patient- and family-centered care," said Johnese Spisso, president of UCLA Health and CEO of the UCLA Hospital System. "Vicki and Ron's pledge is further evidence of their commitment to world-class cancer care by addressing the psychosocial and physical well-being of patients and their loved ones during intense treatment. We are so grateful to have their visionary partnership in our impactful work."



For more information, contact Margaret Steele at: 310-794-5244

UCLA Health Operation Mend Receives a Customized Patient Shuttle

When **Gregory Penske, chairman and CEO of Penske Motor Group**, met with the UCLA Health Operation Mend team in 2019, he was inspired by the Operation Mend story and program. When he discovered one of the program's urgent needs was a patient shuttle, Penske Motor Group gifted the program with a customized shuttle that was recently delivered. The new patient shuttle will provide convenient and free transportation for Operation Mend patients, their caregivers and family members to UCLA facilities and other treatment locations, as well as recreational activities around Los Angeles. On February 27, 2020, Operation Mend and UCLA leadership joined Penske for a ribbon-cutting ceremony for the new shuttle.

"Thanks to Greg for facilitating the customized shuttle from the Penske Motor Group," said Troy J. Simon, executive director of UCLA Health Operation Mend. "It truly is a gift that will remove barriers to treatment for our veterans and improve their well-being while in Westwood."

The new specially modified shuttle bus is designed to accommodate the physical needs of patients, including a wheelchair lift and spacious seating. The bus is wrapped with photos of veterans who have been treated at Operation Mend for injuries suffered while serving in the post-9/11 era. Powered by compressed natural gas, the shuttle will produce approximately 30 percent less greenhouse gas emissions than a comparable gasoline-powered vehicle.

"It is our privilege to support the community in this meaningful way," Penske said. "As we considered Operation Mend's mission to provide comprehensive services to our veterans, we felt the best way we could support this as a transportation services company was to ensure our wounded warriors have a safe, accessible vehicle that gets to and from their scheduled care during their time in Los Angeles. We are grateful for their service to our country that gives us the freedoms we enjoy every day."



Top: The UCLA Health Operation Mend customized shuttle bus from the Penske Motor Group to help veterans on the road to recovery. **Bottom:** (From left) Veteran and Operation Mend patient Darius Johnson, Operation Mend founder Ron Katz, Penske Motor Group CEO Greg Penske, Johnese Spisso, Operation Mend Board of Advisors Chair Dana Katz, veteran and Operation Mend patient Teri Scroggins and veteran and Operation Mend patient Matt Bové at the ribbon-cutting ceremony.

Photos: Reed Hutchinson/UCLA Health

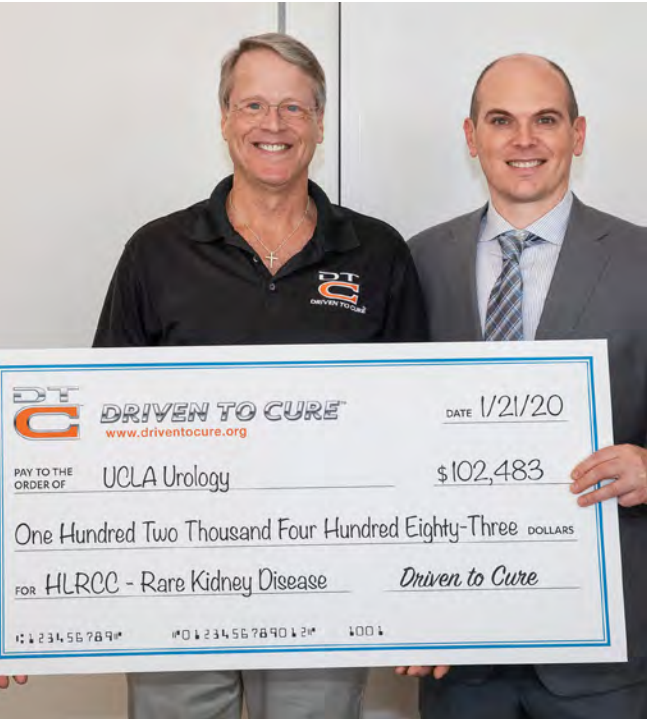
Founded in 2007, UCLA Health Operation Mend helps America's post-9/11 service members and veterans recover from their visible and invisible wounds of war. UCLA clinicians perform highly complex surgeries, as well as address psychological concerns. Many veterans do not have insurance coverage that pays for the services provided by Operation Mend, and many do not know how to secure enough leave time from work, arrange child care or surmount the cost of medical care and personal service needs. All UCLA Health Operation Mend services are at no cost to the veterans, and the program's Gold Standard of Care helps patients cope with these logistical challenges, including coordinating all patient and caregiver transportation, picking up patients and their family members from the airport gate when they arrive, scheduling and escorting patients to appointments, offering a Buddy Family for social support and engagement and providing lodging and group activities while in Los Angeles — making each family feel welcome and comfortable.

"Our veterans deserve the best care and attention," said Johnese Spisso, president of UCLA Health, CEO of the UCLA Hospital System and associate vice chancellor of UCLA Health Sciences. "We are thankful that our Operation Mend program and wounded warriors are so thoughtfully supported by community leaders such as Penske Motor Group."



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

UCLA Kidney Cancer Program Receives Gift for Research on Genetic Forms of Kidney Cancer



Left: Bruce Lee (left) and Dr. Brian Shuch. **Right:** (From left) Drs. Paul Boutros; Sandy Ting Liu (FEL '17); Mark S. Litwin, (FEL '93), chair of the UCLA Department of Urology and The Fran and Ray Stark Foundation Chair in Urology and Brian Shuch; Bruce Lee; Dr. Stuart Holden, The Spielberg Family Chair in Urologic Oncology; Peter Burnham with Driven to Cure; and Dr. Heather Christoff.

Photos: Reed Hutchinson/UCLA Health

On January 21, 2020, **Bruce Lee, co-founder and CEO of the nonprofit Driven to Cure**, and the Lee family presented the UCLA Health Kidney Cancer Program with a check for \$102,483. The gift will benefit physician-researcher Dr. Brian Shuch (RES '10), associate professor of urology, director of the UCLA Institute of Urologic Oncology Kidney Cancer Program and Henry Alvin and Carrie L. Meinhardt Chair for Kidney Cancer Research in the David Geffen School of Medicine at UCLA. The contribution also will facilitate a collaboration between the cancer-research labs at the UCLA Jonsson Comprehensive Cancer Center (of which Dr. Shuch is a member) in disciplines such as tumor metabolism, molecular biology, cancer genomics and population health.

Driven to Cure was founded in 2015 by then-19-year-old Andrew Lee, who sought to combine his two biggest passions: cars and cancer awareness. Andrew Lee was diagnosed with late-stage kidney cancer after his first year of college. The rare form of the disease, known as hereditary leiomyomatosis and renal cell (HLRCC) is caused by a mutation in the fumarate hydratase (FH) gene, which makes an enzyme that is a fundamental component of

how cells use oxygen to metabolize sugar to generate energy. Little was known about the condition, and there were no treatments. To help search for a cure, Andrew Lee, along with his family, decided he would undergo seven different cancer-treatment trials to extend his life. Dr. Shuch, whose research focuses on tumors with mutations in the FH gene, developed a strong relationship with Lee and his father Bruce as Andrew underwent the treatment regimens in various trials at academic centers. Andrew Lee lost his battle with cancer on Easter Sunday, 2019.

Dedicated to advocacy and funding for research on rare genetic forms of kidney cancer, Driven to Cure has raised more than \$600,000 since its inception and has become recognized as a fountain of information for those who suffer from the rare disease. The UCLA Kidney Cancer Program is known as a center of excellence on the West Coast for its expertise in diagnosing, treating and researching rare genetic kidney cancers such as HLRCC.

 **For more information, contact Heidi J. Saravia at:**
310-206-4565

Lab Party Raises Money for UCLA Neurosurgery

More than 120 people attended the **8th Annual Lab Party**, founded by UCLA supporter Kate Berg, to raise vital funds for UCLA neurosurgery research and education. Held on September 19, 2019, the event included an update on the UCLA Steve Tisch BrainSPORT Program, interactive stations with concussion goggles that simulate the effects of a traumatic brain injury and demonstrations of post-concussion breathing techniques. UCLA neurosurgeons Drs. Aria Fallah and Won Kim (MD '09, RES '16, FEL '16) gave a presentation about their work on hydrocephalus, a buildup of fluid in the brain, and the department's goal to conduct annual mission trips to provide health care to underresourced areas. Proceeds from this year's event will fully fund a future international mission trip led by Drs. Fallah and Kim.

"The junior faculty presentations are so compelling and fun," Berg said. "I'm extremely proud of the community we've built around Lab Party."



For more information, contact [Samantha Lang](#) at: 310-351-9806



(From left): Guests Lily Berg, Bec Smith and Lab Party founder Kate Berg.

Photo: Vince Buccì

The Fifth Annual Max Gray Fellows in Mood Disorders Salon



(From left) Drs. John Mazziotta and Kelsey C. Martin, dean of the David Geffen School of Medicine at UCLA and Gerald S. Levey, MD, Endowed Chair; Laurie and Steven Gordon; and Johnese Spisso, president of UCLA Health, CEO of the UCLA Hospital System and associate vice chancellor of UCLA Health Sciences.

Photo: Damon Cirulli

On March 3, 2020, **Laurie Gordon and the Jane and Terry Semel Institute for Neuroscience and Human Behavior at UCLA** hosted the fifth annual Max Gray Fellows in Mood Disorders Salon at UCLA. Gordon established the Max Gray

Fund for Treatment of Mood Disorders in 2014 in memory of her son Max, with the vision of making quality mental health care more accessible. The fund has enabled the Semel Institute to offer 13 postdoctoral Max Gray Fellowships, with plans to recruit additional fellows for the 2020-21 academic year, trained and supervised by Drs. Michael Gitlin (RES '79) and David Miklowitz (PhD '85).

Dr. John C. Mazziotta (RES '81, FEL '83), vice chancellor of UCLA Health Sciences and CEO of UCLA Health, announced the naming of the UCLA Max Gray Child and Adolescent Mood Disorders Program as a lasting tribute to Max. Gordon moderated a conversation with the current fellows, Drs. Artha Gillis and Cassidy Zanko, in the Child and Adolescent Mood Disorders Clinic; and Drs. Eric Rosoff and DS Adnan Majid, in the Mood Disorders Clinic, who shared how the fellowship has positively affected their careers. For the first time, a former patient spoke about how her treatment in the program changed the trajectory of her life.



For more information, contact [Dorin Esfahani](#) at: 310-267-1838

Gifts



Donald and Nancy De Brier.

Photo: Shannon Cottrell

UCLA donors **Nancy** and **Donald De Brier** have continued their long-standing support of UCLA Health's research and patient-care faculty members in the David Geffen School of Medicine at UCLA and the UCLA Jonsson Comprehensive Cancer Center. Their recent gift benefits a variety of areas: Dr. Leonard Marks, Jean B. deKernion, M.D., Endowed Chair in Urology, for his ongoing research in targeted biopsy and focal therapy for prostate cancer, and Dr. Arnold I. Chin (PhD '02, MD '03, RES '09) for his studies to improve treatments of bladder and prostate cancers, both in the UCLA Institute of Urologic Oncology; Dr. Langston Holly (MD '95, RES '01) in the UCLA Department of Neurosurgery; Dr. Eric Esrailian (FEL '06), The Lincy Foundation Chair in Clinical Gastroenterology, in the UCLA Vatche and Tamar Manoukian Division of Digestive Diseases; Dr. David McAllister in the UCLA Orthopaedic Biometrics Laboratory; and for the Urology Education Program under the direction of Dr. Jennifer Singer (MD '96, RES '02, FEL '03), Peter Starrett Term Chair in Medical Education. In the UCLA Jonsson Comprehensive Cancer Center, the De Briers' philanthropy will help advance the pancreatic-cancer research of Dr. Timothy Donahue (RES '09) and Dr. Sarah Larson's (FEL '13) multiple myeloma investigations. The funding also will be directed to the UCLA Health Clinical Innovation Fund. "During the course of our 25 years living in West Los Angeles, Nancy and I have become enormously impressed with the UCLA medical establishment. They provide quick, efficient and highly skilled expertise across a wide range of specialties. Most important, I am impressed with the fact that we have these incredible facilities in our backyard," said Donald de Brier.



The Johnson family (from left): Haley, Gary, Morgan, Wendy and Taylor.

Photo: Christine Photography

Wendy and **Gary Johnson**, along with their daughters Haley and Taylor, established the Morgan Johnson Gruenebaum Endowed Fund for Glioblastoma Research at UCLA in memory of Morgan Gruenebaum, who was treated at UCLA for a unique type of malignant glioblastoma multiforme (GBM) that typically occurs in teenagers and young adults. Morgan, the Johnsons' daughter and Haley and Taylor's sister, passed away on September 24, 2019, at home with her husband Ben Gruenebaum, at the age of 33, after battling brain cancer for almost two years. To honor Morgan's legacy, the family started the fund with an initial goal of raising \$100,000. In just over two months, UCLA received more than 230 gifts and \$130,000. The contributions will advance progress in the diagnosis and treatment of brain cancer — specifically GBM — with a focus on supporting research on pediatric and rare GBM, as well as clinical trials and patient care. Morgan's family and friends continue to garner support, which includes matching gifts from Morgan's employer and a charity golf tournament to take place at Old Ranch Country Club in Seal Beach, California, on November 16, 2020.

The **L.A. Care Health Plan** has contributed more than \$540,000 to support two new pediatric residency positions at the David Geffen School of Medicine at UCLA. This new gift is part of the L.A. Care Elevating the Safety Net Residency Support Program, which is intended to address the growing shortage of primary care physicians and recruit more physicians to serve the county's most vulnerable residents. UCLA was one of just five institutions to benefit from this new initiative. Thanks to this gift, the UCLA Pediatric Residency Program will expand in the summer of 2020 to include two new residency positions.



Alan and Judi Wapner.

Photo: Courtesy of the Wapner family

Judi and **Alan D. Wapner**, a City of Ontario council member, made a contribution to support Huntington's disease clinical trials led by Dr. Susan Perlman (RES '79, FEL '80) in the UCLA Department of Neurology. The couple also raised hundreds-of-thousands of dollars by hosting a fundraiser that also will support Dr. Perlman's Huntington's disease research and clinical trials.



**For more information, contact
Health Sciences Development at:
310-206-6484**

The Messenger

By Shangxin Yang, PhD (FEL '16)

AS I LOOKED AT THE MESSAGES AND PICTURES POPPING UP ON WECHAT FROM RELATIVES, FRIENDS AND COLLEAGUES IN CHINA, it was difficult, at first, to grasp exactly what I was seeing. It was around Christmas, and word of a mysterious pneumonia was only just beginning to filter out of Wuhan, with no hint of how in just a few months it would explode as a global pandemic.

My initial thought was that it was a reemergence of SARS, which flared 17 years ago. And every time I heard talk about it arising from a seafood market where they sell wild animals, it struck me as similar to illnesses that have arisen when a bat virus jumps to an intermediary host and then to a human.

The government in China wasn't yet talking about human-to-human transmission. But I know a great deal about virology — I have lectured on the subject to our pathology residents and microbiology fellows — and the news coming out of Wuhan suggested this wasn't limited to animal-to-human transmission. Already, some 70 people had been reported infected; I'd never heard of any animal-to-human viral transmission that had affected so many people at one time. It was obvious to me that human-to-human transmission was taking place.

And I knew it was going to be bad.

It turned out I was right that it would be bad. But I was wrong in my estimate of how bad. I thought it would be like SARS, which infected about 8,000 people, killing 800, before it died out. But as of this writing, in early April, there have been, according to the World Health Organization, more than 1 million confirmed cases of COVID-19 and more than 72,000 deaths worldwide.

I began to look more closely at the images and messages I was receiving daily from 6,800 miles away. This was real information, in real time, from friends and colleagues — doctors and nurses and health care professionals on the frontline of the epidemic in and near Wuhan. They were telling me what really was happening.



They told me there were more than 10,000 cases in the city at that time — far more than the government was reporting — and about hundreds of patients lining up for hours to get into hospitals and often being turned away because they were full. They sent me videos and pictures of desperate people in surgical masks crowding around what appears to be the front desk of a clinic. There was an image of a woman sitting on a subway, a blue mask covering her face and a child on her lap, enshrouded in what looks like a plastic dry cleaning bag. People standing in line for a train or shopping in a market with plastic five-gallon water bottles over their heads. The face of a black-and-white cat covered in a blue mask, its green eyes peering through holes cut in the fabric. Empty streets. A man in a car with a diaper wrapped over his nose and mouth. More people covered in plastic standing in lines or sitting at desks. More empty streets.

The pictures looked like scenes from a war zone.

I wanted my colleagues at UCLA to know how bad I thought this was going to be. In my clinical microbiology laboratory, everyone had heard about this mysterious illness in China, but, like me at first, they didn't recognize what it had the potential to become. Before this became a story dominating the headlines, I started sharing what I knew — firsthand information direct from ground zero of the outbreak — with Dr. Omai Garner (FEL '12), the director of clinical microbiology, as well as with members of our UCLA Emerging Infectious Disease program and my lab colleagues at the Los Angeles County Department of Public Health.

It was important that everyone understand what was coming.

Now I was looking at heat maps showing the spread of the illness. It moved very quickly. From the plot points on the map, you could see that within a week, it had spread from Wuhan, in Hubei Province, across nearly all of China.

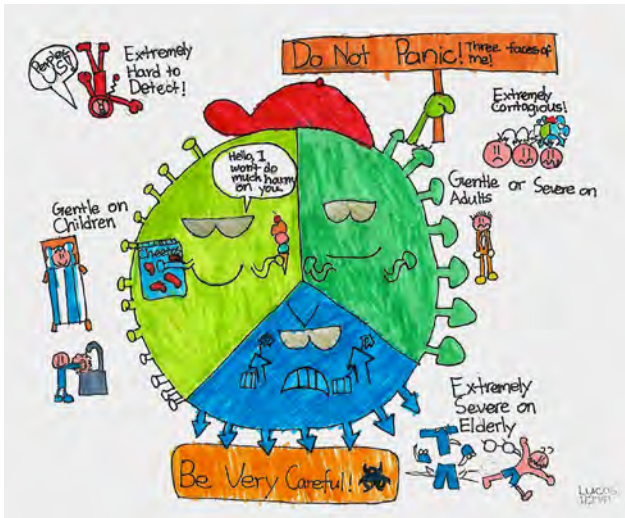


I was struck by its incredible speed and the scale of the number of people infected.

This was nothing like SARS, which, even though it spread to more than two-dozen countries, was more regional and easy to check.

I gave my first lecture about this virus in mid-January, telling the students that this was a new coronavirus and was much more contagious than the previous coronaviruses we had seen.

I told them how quickly this outbreak spread. "This is not a good time to travel," I said. "You don't want to go to the airport." I told them to wash their hands.

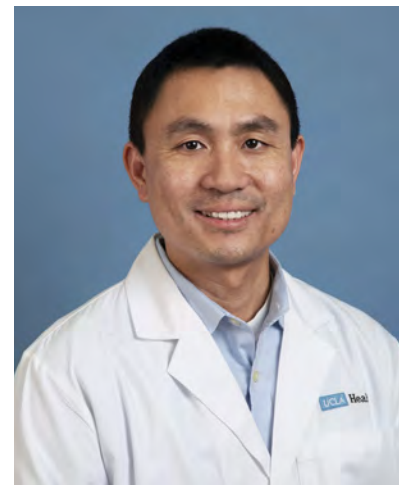


The images that Dr. Shangxin Yang was receiving on WeChat in December and January from friends, family and colleagues in China suggested a crisis that might grow to pandemic proportions. He talked with his family about what he saw developing, and his 8-year-old son drew a picture (below left) to process the information.

Images: (China) Courtesy of Dr. Shangxin Yang; (drawing) Lucas Yang

I talked so much about it that my 8-year-old son started to ask me questions. "Am I going to die?" he asked. No, I told him. It's going to be OK. "Are you going to die?" he asked. We talked a lot about the virus. I wanted him to understand about it, not just about what was happening but also about the science. I explained that this virus has different risks for different populations. For kids, it's not that bad. For the elderly, it could be very bad. And for everyone in between, it depends. He listened to what I told him, and then he took out his pens and drew a picture of the three faces of coronavirus.

The photos and video I received from Wuhan indeed looked like they were from a war zone. And I tell people that we literally are in a war. Our common enemy is a virus, and it is causing untold casualties. I don't know what is going to happen. I am glad that I am in the fight. You just have to do your best and cherish what you have.



Dr. Shangxin Yang is clinical assistant professor of pathology & laboratory medicine and assistant medical director of the UCLA Health Clinical Microbiology Laboratory.

Photo: UCLA Health



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U.S. News & World Report's Best Hospital Survey ranks UCLA #1 in California and #6 in the nation.

David Geffen School of Medicine at UCLA ranks #6 in Research and #11 in Primary Care nationwide.

#TeamLA



Photo: Courtesy of Dr. Shangxin Yang



Alarming scenes, like this one broadcast earlier this year on a news channel in Shanghai, China, proclaiming, "The situation in Wuhan is very severe, and the battle with the outbreak is just starting," suggested to UCLA microbiologist Dr. Shangxin Yang ("The Messenger," pg. 52) that the mysterious pneumonia sickening people in Wuhan might be a new illness that potentially could escalate to pandemic proportions.