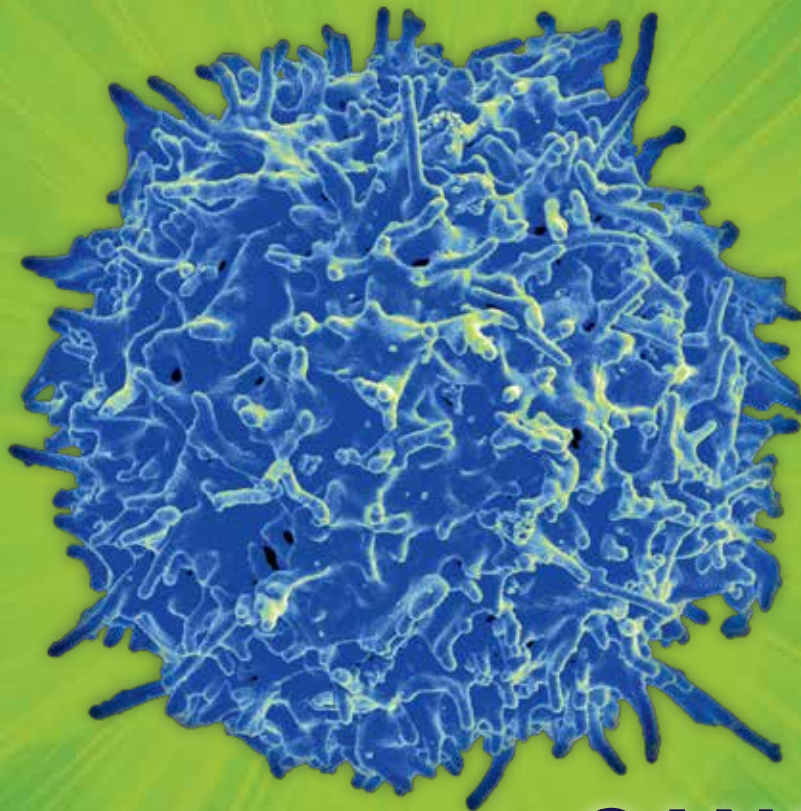


UCSF

MAGAZINE

Spring 2015



CANCER'S FIERCE NEW FOE

Deploying the T cell
against melanoma

Mission Bay Hospitals! • Service Superstars • Research at Risk

UCSF MAGAZINE

SPRING 2015

Feel Good Knit-a-Long

In early 2015, Bluebird Yarn and Fiber Crafts in Sausalito, Calif., invited customers and friends to knit blankets for patients at UCSF Benioff Children's Hospital San Francisco. The store created 100 kits with simple patterns and yarn in the hospital's bright colors. Knitters snapped them up in just a week, eager to bring a little warmth to young lives.

Read more: bit.ly/ucsf-knit



FEATURES

12 Mission: Migration

Marvel at the complexities of the move to UCSF's new medical center.

20 Unleashing the Immune System

Oncologists liberate the T cell to beat back melanoma.

26 Science Interrupted

How rifts in funding stymie young researchers.

32 Steeped in Service

Luminaries light up UCSF's legacy of public service.

DEPARTMENTS

2 What Matters

3 Dialogue

4 Inside UCSF

11 Faculty Accolades

24 Big Picture

36 Philanthropy

37 Alumni Hub

48 Double Take



UC San Francisco is in a constant state of evolution.

We are continually pursuing new discoveries, forging new alliances, testing new therapies, and launching new programs.

Our accomplishments can be attributed to the talented individuals who teach, discover, learn, and support our mission every day and provide our world-renowned patient care. This was clearly demonstrated at the recent

opening of the UCSF Medical Center at Mission Bay, which comprises three world-class facilities – UCSF Benioff Children’s Hospital San Francisco, UCSF Betty Irene Moore Women’s Hospital, and UCSF Bakar Cancer Hospital – San Francisco’s first new hospitals in decades.

The culmination of a remarkable 10-year collaboration came to fruition on February 1. Early that Sunday, we brought the first 131 patients through the hospital doors. There was an instant buzz of activity, as doctors and nurses engaged with patients and delivered care. The buildings came alive, bringing a long-awaited vision into reality. Learn more about this magical day on page 12.

Without a doubt, the people of UCSF are its driving force and give our great university meaning. Two people who warrant particular mention are Alan Ashworth, who joined us in January as president of the UCSF Helen Diller Family Comprehensive Cancer Center, and Daniel Lowenstein, resident alumnus and longtime UCSF faculty member, who was appointed executive vice chancellor and provost. Alan, featured on page 23, is an ideal leader for our cancer enterprise in this era of genomic and precision medicine. Dan’s in-depth knowledge of UCSF and long-standing commitment to our community will have a significant impact on his new role.

UCSF is at a transformative point in its history. Thank you for taking a moment to share it with us.

Sam Hawgood, MBBS
Chancellor
Arthur and Toni Rembe Rock Distinguished Professor

UCSF MAGAZINE

FOR ALUMNI AND FRIENDS

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Benioff @UCSFChildrens Hospital introduced me to some amazing patients & shared their new health technology.



Bill Gates

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Work by a team @UCSF could help predict and prevent the spread of malaria: b-gat.es/1wbo6lQ



KGO Radio

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Scientists at #UCSF are using wasabi to learn how to manufacture more effective pain medications goo.gl/vJbijU



Sue Desmond-Hellmann

@SueDHellmann

Congrats to @UCSF! RT ICYMI, @UCSFMedicine is only US med school in top 5 for research & primary care. #humblebrag <http://bit.ly/1b04MaB>



Kevin Spacey

@KevinSpacey

Great to celebrate the #ucsf gala last night in SanFran. Sang 3 numbers w/choir from Oakland School for the Arts.



Jonathan Hirsch

@JonathanHirsch

Nussbaum @UCSF “genomics today is like reading hieroglyphics without Rosetta Stone. Need genotype-phenotype dbase” @Syapse #ACMG15 #ACMG15

Sculpting the Microbiome

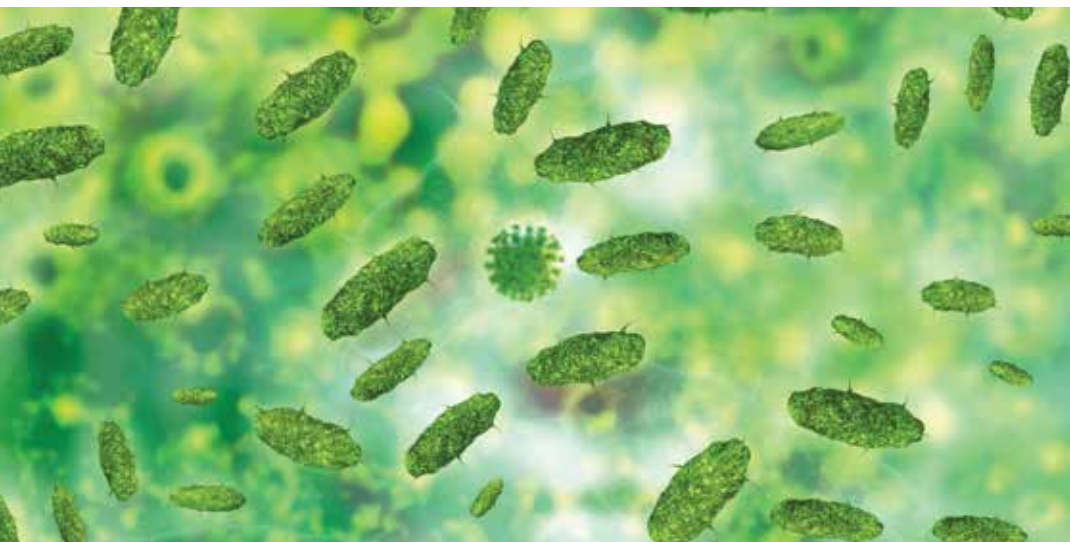
The myriad species of microbes dwelling within your digestive system can affect your health by influencing your metabolism – and possibly even your behavior. Indeed, a recent UC San Francisco study revealed that your diet may be even more important than your

genes in determining the relative abundance of your gut bacteria.

The makeup of the gut microbiota varies tremendously among individuals and also can vary over a given individual's lifetime. Until now, it has been unclear whether that variation is driven more by differences in people's unchangeable genetic backgrounds or more by differences in their diets and other environmental influences.

Peter Turnbaugh, PhD, an assistant professor of microbiology and immunology, led a team that was able to use diet to alter the makeup and abundance of microbes in the guts of mice in a way that was reproducible and largely independent of genetic differences among the mice.

"It may someday be possible to design diets that shape the gut microbiome in a way that is therapeutically beneficial," Turnbaugh says. "The good news is that the microbial response to a given diet may be similar for many people's microbial communities, suggesting that we might not need to tailor interventions differently for every single person."



Developing a Noninvasive Endometriosis Test

Approximately 10 percent of women in their childbearing years suffer from endometriosis, an often-painful condition characterized by the growth outside the uterus of tissue from the uterine lining. Diagnosing endometriosis currently involves laparoscopic surgery under general anesthesia, but a recent UC San Francisco study may eventually relegate the process to a simple, noninvasive procedure conducted in a doctor's office.

Linda Giudice, MD, PhD, chair of obstetrics, gynecology, and reproductive sciences, used machine learning, a computer-based technology, to analyze the gene activity of endometrium tissue samples.

As hormone levels change throughout a woman's menstrual cycle, Giudice and her colleagues have found, gene expression

patterns in the uterine lining of women with endometriosis remain distinct from those of women without the condition. Based on this difference, a simple test on a tissue sample obtained in a doctor's office could one day determine whether endometriosis exists and how far it has progressed, says Giudice, who holds the Robert B. Jaffe, MD, Endowed Professorship in the Reproductive Sciences.

The next step is to validate the findings in a larger population. The National Institute of Child Health and Human Development's Reproductive Medicine Network has launched a multisite clinical trial to do just that. Once the trial is concluded, the technique could help millions of women with this painful disease avoid the additional pain and expense of surgery.



ILLUSTRATION, TOP: XRENDER

UCSF Designated National Ebola Treatment Center

If an Ebola outbreak ever hits the Bay Area, UC San Francisco will be ready.

In late 2014, state health officials and teams from the federal Centers for Disease Control and Prevention designated UCSF Medical Center as one of eight Ebola treatment centers in California. Altogether, as of March 2015, 50-some hospitals nationwide received the designation.

The designation is based on a hospital's ability to provide the necessary staff, training, equipment, and other resources to treat patients with the unique care requirements of Ebola,

a severe and often fatal viral disease. UCSF is the only medical center in San Francisco to earn the designation.

Secure isolation rooms capable of handling two patients with the disease were built at UCSF's Mount Zion campus, and more than 100 physicians, nurses, clinical scientists, respiratory therapists, and health safety workers have volunteered to provide care.

"As a public institution, we think it is a very important service we can provide for the community," says Adrienne Green, MD, UCSF's associate chief medical officer.



Another NIH Research Funding **GRAND SLAM**

In 2014, for the second year in a row, UC San Francisco's four schools topped their fields in funding from the National Institutes of Health (NIH); in addition, the University as a whole received more NIH grants than any other public recipient and the second highest total among all institutions. The UCSF School of Medicine surpassed all other medical schools in the country in NIH funding for the third year in a row, bringing in \$480.6 million to support research, graduate-student training, and fellowships for postdoctoral scholars. The UCSF schools of pharmacy, dentistry, and nursing also ranked first in their fields in NIH grants: pharmacy for the 35th consecutive year, with \$31.8 million; dentistry for the 23rd straight year, with \$15.5 million; and nursing for the 10th time in the last dozen years, with \$10.1 million.

"It's like hitting the reset button on your computer.... It's the first time we've been able to do that in the brain."

Epilepsy specialist Vikram Rao, PhD '06, MD '08, on the NeuroPace neurostimulator, which helps stop epileptic seizures, quoted in the *San Francisco Chronicle*



YOUR BODY ON SUGAR

In the wake of the soda tax controversy that consumed the Bay Area during the 2014 election, UCSF launched **SugarScience.org**, an interactive website showcasing up-to-date scientific data about sugar and its health effects. **Kirsten Bibbins-Domingo**, PhD '94, MD '99, and resident alumna, holds the Lee Goldman, MD, Endowed Chair in Medicine and is one of the scientists behind SugarScience. Also director of the UCSF Center for Vulnerable Populations, she is dedicated to helping her patients make better dietary choices for themselves, their families, and their communities. Here, she discusses how too much sugar can make you sick.

How did the website come about?

All of us involved in SugarScience have a history of working on sugar's health impacts. But heightened concerns about obesity and diabetes, as well as ballot measures in New York City and the Bay Area, made it clear we needed a good public resource to disseminate the wealth of scientific evidence we have about sugar.

What does science say about sugar's effects on our health?

What's striking is the rising tide of diabetes in the U.S., particularly in poor populations. It used to be a disease of middle age, but now we're seeing type 2 diabetes in adolescents. A decade ago, one in 11 teenagers had pre-diabetes. Now we see it in one in four, and in poor and minority communities, it's closer to one in two. The evidence is clear and compelling that added sugar is a major contributor to that trend.

How does sugar cause heart disease, hypertension, and other illnesses?

Diabetes is our strongest risk factor for heart disease. But in people who consume excess sugar – even in the absence of diabetes, obesity,

or weight gain – their blood pressure goes up. The kidneys control blood pressure, and byproducts from processing all these sugars trick the kidneys into raising blood pressure, which can lead to heart disease and stroke.

What's the easiest way to cut back?

Cut out sodas! They account for almost half the added sugar in our diets and have no nutritional value whatsoever. But even more important, Americans don't eat enough fruits and vegetables. It's clear that diets high in fresh fruits and vegetables and whole grains are healthier, but when you're eating lots of added sugar, you're not eating enough of the other things. The point is to have balance: limit your daily sugar intake to 25 grams (5 teaspoons) for women and 38 grams (7.6 teaspoons) for men and pay attention to added sugar in foods like cereals and yogurt.

How can parents help their kids consume less sugar?

I have a teenage son, so I know it's hard. But our patterns of consuming food start very young. Do you always have a sweet beverage or dessert with your meal, or are sugary things limited to special occasions? Kids are exposed

Too much
added sugar
from
soda
and
sports
drinks
can overload
critical organs



to lots of images that make sugar attractive, but what happens at home can reinforce healthy or unhealthy choices.

Why are low-income populations so vulnerable?

If your resources are limited, your diet centers on things that cost less. Over the last several decades, the price of sugary things has gone up less than the price of fruits and vegetables – so healthier choices are more expensive. And many neighborhoods don't have healthy grocery options, so it's hard for my patients to make healthy choices even if they want to. We hope the website will not just influence individual choices but also inspire communities and policymakers to think collectively and find solutions for all our citizens, especially the most vulnerable.

During my day, I cannot live without...

Erik Hansen, MD '05, orthopaedic surgeon, UCSF Orthopaedic Institute

“Dry roasted almonds from Trader Joe’s. They are a perfect and satisfying snack for someone like me who has limited time to sit down and eat, whether I’m between surgical cases or catching up on charting between morning and afternoon clinic.”



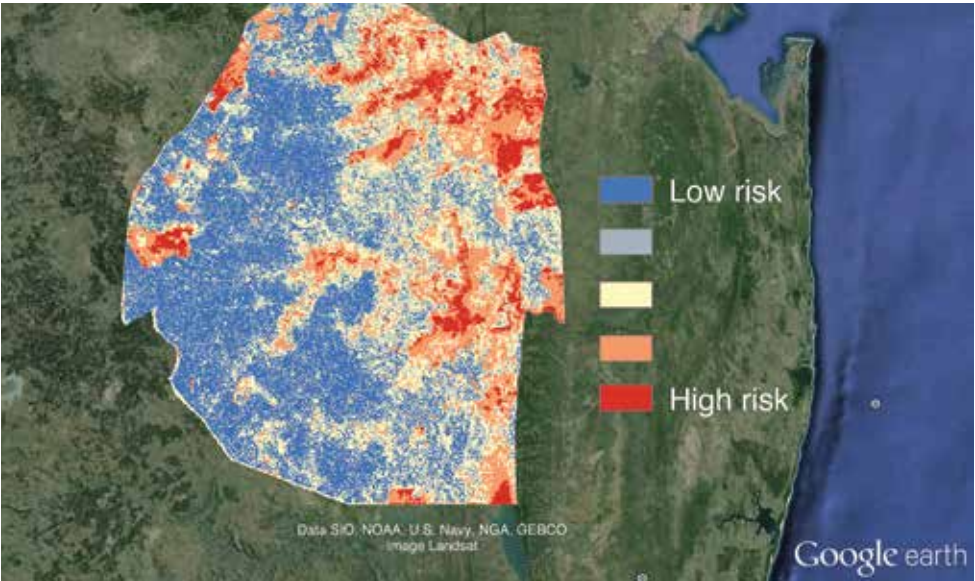
Mitra Assemi, PharmD '97, professor of clinical pharmacy and associate dean, School of Pharmacy; and program director, Fresno Pharmacy Education Program

“Videoconferencing equipment. I am based in Fresno, and it is my lifeline to actively participate in meetings with colleagues at Parnassus and across the state. Our school has faculty spread out over six areas of California. Videoconferencing is how we get day-to-day business done – meetings and sometimes even teaching-related activities.”



Egle Cekanaviciute, PhD, postdoctoral fellow, Department of Neurology

“Clipboards. I usually have two or three going at a time – one for each experiment I’m working on. I attach all my notes associated with an experiment to the clipboard, including which order I’m doing things in and my overall plan. I scribble on them all day.”



Google Mapping Malaria

Most Americans don’t worry much about malaria – but globally, the mosquito-borne disease kills 600,000 people a year, most of them children. UC San Francisco’s Global Health Group is helping create an online tool, using data from Google Earth Engine, to help health workers predict where malaria might be transmitted. The tool will be piloted in Swaziland (pictured), a small country in southern Africa. “With these maps, health workers will know exactly where to target their scarce resources,” says Hugh Sturrock, PhD, an assistant professor of epidemiology and biostatistics and a researcher in the Global Health Group. “That way, they can keep fighting the disease until it’s eliminated within their borders.”

PHOTOS, TOP: GEOFFBLACK; ANDREYPOPOV; T_KIMURA

Nursing Launches New Palliative Care Minor

DorAnne Donesky, RN, MS '90, PhD '03, remembers the patient well: The woman had been diagnosed with chronic obstructive pulmonary disease and heart failure and had been given just months to live. She was put on hospice care and given medication – but also breathing exercises and nonpharmaceutical strategies for managing her symptoms.

Those simple, palliative interventions helped the patient eventually return home. A year later, she was medically stable, enjoying her family, and exercising daily.

Both research, and anecdotal examples like this, increasingly support the theory that comprehensive palliative care can significantly improve a patient's daily life – and sometimes even prolong it. That's why UCSF's School of Nursing has started a new palliative care minor for advanced practice nursing students.

Palliative care focuses on improving

patients' quality of life by addressing not only their physical symptoms – especially those associated with acute or chronic illnesses that can be managed over the long term – but also their emotional needs and even the concerns of family members. Not surprisingly, communication skills and interprofessional teamwork are key elements of the palliative care minor.

“A lot of patients are in distress over relationships that have not been mended or are thinking about where their place is in the world, whether their life will have meaning, what their legacy will be after they're gone,” says Donesky, a professor of nursing who helped spearhead the minor. “For clinicians, it's scary to talk about these topics. But if we as a team embrace and explore these issues in addition to addressing symptom management and quality-of-life concerns, the patients often move to a new level of health and peace.”



Professor of Nursing DorAnne Donesky (right).

PHOTOS, FROM TOP: ELISABETH FALL; PASSIAVA

“About five years from now, insurance companies are going to look at the amount of money they are paying out in treatment for chronic diseases, and they will determine that prevention pays better than treatment.”

Robert Lustig, MD, pediatric endocrinologist and resident alumnus, quoted in a [Los Angeles Times](#) story on health experts' predictions for the near future



Fueling a Healthy Economy

Health is big business in San Francisco, accounting for 20 percent of the city's workforce and contributing \$28 billion annually to its economy — more than tourism or technology — according to a 2014 economic impact report.

UC San Francisco plays a huge role in that vast sector. Founded 150 years ago, UCSF is now the city's second-largest employer, with nearly 23,000 faculty and staff. Before the end of the decade, various stakeholders will invest close to \$5 billion in the construction of five new medical centers, including UCSF Medical Center at Mission Bay.

UCSF also is recognized for its catalytic role in spinning off biotech companies at Mission Bay, including QB3, a consortium run by UCSF, UC Berkeley, and UC Santa Cruz. UCSF Mission Bay is now a \$31-billion, 60-acre campus and represents the largest single redevelopment project in the city.



A FISHY FIX FOR INFLAMMATION

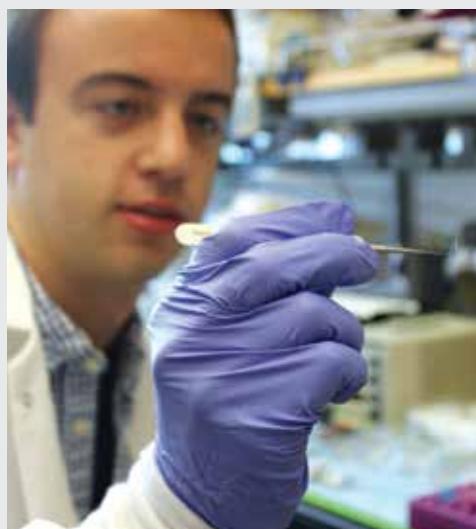
Doctors implant more than a half million stents annually to prop open patients' blocked arteries and restore their blood flow. But often, inflammation triggers a process that reblocks the vessel as the area heals. UC San Francisco researchers are exploring ways to halt that process using potent compounds produced naturally from fish oil.

Following an injury, the body first generates compounds that promote inflammation and then a second set of compounds that stop or resolve the inflammation. Fish oil contains eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), two omega-3 fatty acids that are the key precursors for the "pro-resolving" signaling compounds.

Michael Conte, MD, chief of vascular and endovascular surgery — with collaborators Tejal Desai, PhD '98, chair of UCSF's Department of Bioengineering and Therapeutic Sciences, and Charles Serhan, MD, of Harvard University — is developing ways to deliver these compounds to prevent ongoing inflammation in stented blood vessels.

Desai's lab focuses on therapeutic microtechnology and nanotechnology, including stents with unique surface textures that can reduce reblockage and absorb the fish oil-derived compound, allowing it to slowly disperse into the artery.

"This idea has huge potential," says Conte, who holds the Edwin J. Wylie, MD, Chair in Vascular Surgery. "The development of devices that could locally deliver these naturally occurring compounds to improve artery healing could have a broad impact in cardiovascular medicine and surgery."



Graduate student Kevin Lance holds up a tiny "wrap."

6 Translational Science Trends That Will Improve Your Health

Sometimes called bench-to-bedside research, translational science aims to quickly move new treatments from the laboratory to the patient. A number of trends are reshaping – and accelerating – translational science’s focus on improving health. UCSF’s Clinical and Translational Science Institute (CTSI) shares six developments to watch.

Listen to learn more: bit.ly/ucsf-trends

1 Academic-Industry Partnerships



Academic institutions are reimagining partnerships with industry. CTSI’s Catalyst Awards, for example, have expanded the role industry experts play in accelerating research. Customized consultations help researchers navigate the complexities of translating big ideas into specific solutions for patients.

4 A Hybrid Online Learning Model



MOOCs – massive open online courses – are effective in some situations but have drawbacks for *intensive* distance learning. Ob-gyn Vanessa Jacoby, MD ’01, extols a hybrid model that creates the intimacy of a classroom online. She teaches a virtual course that’s identical to its traditional counterpart in every respect but time and place; students can participate from anywhere, but the learning objectives, course content, assignments, and peer interactions are the same as in a lecture hall.

2 The Team Science Revolution



Multidisciplinary collaborations are making science a team effort. Executive Vice Chancellor and Provost Dan Lowenstein, MD, says this simple idea is revolutionizing research. A neurologist and leader of the Epilepsy Phenome/Genome Project, a worldwide collaboration among 27 clinical centers and 100 scientists and clinicians, he is helping spearhead that revolution.

5 Sharing of Big Data



Today’s ability to analyze massive amounts of data holds much promise for health care. But the lack of uniformity in collecting data has been a barrier to making effective use of it. A program called UC Research eXchange (UC ReX) aims to overcome that hurdle by securely aggregating patient data to accelerate the clinical research process.

3 Internet-Enabled Clinical Research



Epidemiologist Mark Pletcher, MD ’98, gathers data through a “virtual clinic” to help predict and prevent heart disease. Using the Internet to conduct small-scale studies or recruit local study participants is nothing new. But researchers are now leveraging the benefits of large-scale online clinical research – including reduced costs, improved efficiency, and access to a previously unimaginable number of study participants.

6 Streamlined Regulatory Approval



An institutional review board (IRB) or ethics committee must approve, monitor, and review every study involving humans. But institutions often have different IRB processes, making it difficult and time-consuming to do multi-institution research. Now a group called University of California Biomedical Research Acceleration, Integration, and Development (UC BRAID) is aligning the regulatory approval process across institutions to streamline research collaborations.

FACULTY ACCOLADES

Adam Abate, PhD, assistant professor of bioengineering and therapeutic sciences, received the National Institutes of Health's New Innovator Award. The five-year award will support the development of a novel approach for profiling the immune systems of patients with rheumatoid arthritis by identifying which B cells – a type of immune cell – are mistakenly recognizing the body's own tissues as foreign.

Bruce Alberts, PhD, the Chancellor's Leadership Chair in Biochemistry and Biophysics for Science and Education, received the 2014 Philip Hauge Abelson Prize from the American Association for the Advancement of Science. The prize is given annually to either a public servant, in recognition of sustained exceptional contributions to advancing science, or a scientist whose career has been distinguished both for scientific achievement and other notable services to the scientific community.

Adam Carrico, PhD, a postdoctoral alumnus and assistant professor of community health systems, received the American Psychological Association's 2015 Psychology and AIDS Emerging Leader Award for his dedication to improving health outcomes among persons living with or at high risk for HIV through exceptional research, teaching, mentoring, and service to the field. It is the first time a faculty member in UCSF's School of Nursing has received this award.

Charles Craik, PhD, a postdoctoral alumnus and professor of pharmaceutical chemistry and the director of UCSF's Chemistry and Chemical Biology Graduate Program, was named a fellow by the National Academy of Inventors. Fellowship is accorded to academic inventors who have demonstrated a spirit of innovation in creating or facilitating inventions that have made a tangible impact on quality of life, economic development, and the welfare of society. Craik is internationally known for his work on proteolysis, both fundamental studies and the application of that knowledge to the diagnosis, monitoring, and treatment of disease.

William DeGrado, PhD, professor of pharmaceutical chemistry, received the 2015 Stein and Moore Award from the Protein Society. The award recognizes eminent leaders in protein science who have made sustained, high-impact research contributions to the field.

Three faculty members – **Eric Goosby, MD '78**, a resident alumnus and professor of medicine and the director of the Institute of Global Health Delivery and Diplomacy; **Deepak Srivastava, MD**, a resident alumnus and professor of medicine and the director of the Gladstone Institute of Cardiovascular Disease; and **Ron Vale, PhD**,

a professor of cellular and molecular pharmacology and Howard Hughes Medical Institute investigator – were elected to membership in the Institute of Medicine. IOM membership, one of the highest honors in health and medicine, recognizes individuals who have demonstrated outstanding professional achievement and commitment to service.

The International Association for Dental Research created a new Distinguished Scientist Award honoring **John Greenspan, BDS, PhD**, a professor emeritus of the School of Dentistry and the associate dean emeritus for Global Oral Health. The award recognizes scientists who have made significant research contributions addressing inequalities in and social determinants of global oral health.

Richard Jordan, DDS, PhD, a professor of oral pathology, pathology, and radiation oncology and the director of oral pathology for UCSF's Dermatopathology and Oral Pathology Service, has been appointed to the National Cancer Institute's Head and Neck Cancer Steering Committee. It is one of 16 steering committees charged with reviewing and approving new NCI-supported clinical trials.

Shingo Kajimura, PhD, an assistant professor of cell and tissue biology in the School of Dentistry and the UCSF Diabetes Center, received a Helmholtz Young Investigator in Diabetes Award, recognizing a rising star in the field of diabetes research. The honor was accompanied by an invitation to present his research at the second annual Helmholtz-*Nature Medicine* Diabetes Conference in Munich, Germany.

David Vlahov, RN, PhD, a professor of community health systems and the dean of the School of Nursing, was inducted into the Johns Hopkins Society of Scholars. The society inducts former postdoctoral fellows, postdoctoral degree recipients, house staff, and junior or visiting staff who served at least a year at Johns Hopkins and later made outstanding contributions to their fields.

Jonathan Weissman, PhD, a professor of cellular and molecular pharmacology, won the National Academy of Sciences' inaugural Award for Scientific Discovery. The award, which was created to recognize an accomplishment or discovery in basic research within the past five years, honored the development by Weissman and his colleagues of a technique called "ribosome profiling"; the process allows researchers to sequence chunks of messenger RNA that ribosomes are decoding, providing a snapshot of the genes being translated within a cell.



MISSION: MIGRATION

UCSF Medical Center at Mission Bay opened to its first patient – a woman about to give birth – at 7 a.m. on February 1. Embodied in that moment was an undertaking so epic, it's hard to know how to quantify it: In tons of steel welded or miles of pipe laid? In acres of earth turned or a decade of meetings logged? No matter the metric, the process went without a hitch.

By Claire Conway



MED CENTER BY THE NUMBERS ➤ 9,272 tons of steel, enough to build 8,000 cars ➤

INCOMING

Five-year-old Rylan Macomb (above) blazed through the double doors of UCSF Medical Center at Mission Bay with hip shades, a glitter glove, and awe. The hospital was but one hour old. No one had told him the lobby would be full of fans – staff frantically waving and fawning over his unmistakably Michael Jackson-like cool.

Rylan arrived in one of the 40 ambulances lined up along Parnassus Avenue at daybreak to take 131 patients to the new Mission Bay complex. Ambulances transported 10 cancer patients from Mount Zion to Mission Bay that morning as well.

Two command centers – one at Mission Bay and one at Parnassus – orchestrated the day's events to the minute. The move team showed up long before the ambulances. "We met at 4:30 that morning, a little bleary-eyed, to talk about every patient being transported and finalize the sequence," says Michelle Cathcart, RN, who directed the

patient move with Scott Soifer, MD, vice chair of pediatrics.

The team had carefully calibrated the list, discussing it every afternoon for the previous two weeks. Which patients would need ventilators or the incubating units known as Isolettes? What experts (and medications) did each patient need to travel with – a bedside nurse, a physician, or a respiratory therapist...or all three?

The most complex patient was a child with the flu who was supported by a heart-lung machine. "We sat with the mom and told her that the ambulance would have two doctors, one being the child's surgeon, someone who ran the pump machine, and two nurses," says Soifer. The team did three practice runs, with equipment, for this child.

"Seeing that that patient left within two minutes of her assigned time and hearing that they made it there safely – those were my moments that day," recalls Cathcart. "I thought, 'This is finally real. We did it.'"



► 12,451 light fixtures, enough for 1,000 homes ► 85 miles of piping, the equivalent of 50 Golden Gate Bridges ►



Transport

The Imaging Theater at Mission Bay takes the anxiety out of CT and MRI scans for adults and children alike by projecting calming images, live video, light shows, and surround sound to distract and soothe patients during procedures.

Hospitals

UCSF Medical Center at Mission Bay comprises UCSF Ron Conway Family Gateway Medical Building, UCSF Benioff Children's Hospital San Francisco, UCSF Betty Irene Moore Women's Hospital, and UCSF Bakar Cancer Hospital.

The 70-bed UCSF Bakar Cancer Hospital, located across campus from the UCSF Helen Diller Family Cancer Research Building, will facilitate collaboration between clinicians and basic scientists.

PHOTOS, FROM LEFT: NOAH BERGER, ELISABETH FALL

Special Delivery

Two-week-old twins Bianca and Sienna were the first patients transported to Mission Bay, arriving safely with their moms just before 8 a.m.



Quick Peek

Rylan didn't have to leave his room for a chest X-ray; a mobile X-ray machine came to him.

► 210 miles of conduit, enough to stretch along 3,360 San Francisco blocks ►

DREAM SPACE

Nearly a decade ago, architects and designers asked UCSF clinicians and families of longstanding patients to describe their vision of the ideal hospital. Their input can be seen in every aspect of the hospitals' design, from the operating rooms to the roof gardens.

"These units are perfect because the clinicians and patients designed them themselves," says Kim Scurr, executive director of UCSF Benioff Children's Hospital and of hospital operations planning at Mission Bay. The operating rooms are spacious and fully integrated technologically, so that during a procedure, surgeons can instantly access patient information, such as lab results and imaging studies.

UCSF partnered with GE to create an Imaging Theater to allay children's fears of MRIs and CT scans. The theater projects calming images,

live video, color-changing LED lights, and soothing stereo sounds to change the experience from frightening to transportive. Studies are currently under way to determine whether children imaged in such a space will need less medication to quell their fears.

Design determinations were made not just for the sake of functionality but also to enhance healing. Because studies show that light and quiet accelerate healing, every patient room in the hospital complex has a window with a bay or garden view. There are meditation rooms and 4.3 acres of green space, including 60,000 square feet of terraced roof gardens, where adult patients can achieve a sense of renewal or a change of perspective or work on their physical therapy. For children, there are both indoor and outdoor play areas.



Code Blue

During a “day in the life” rehearsal, a UCSF staffer posed as a patient suffering a seizure during an imaging procedure. Trainers timed physicians and nurses as they grabbed a crash cart filled with tools needed to open an airway – defibrillator, medications, and intubation equipment – and rushed to the scene to stabilize the “patient.”

➤ 1,125 miles of wire, enough to circle the bases at AT&T Park 16,500 times ➤

To make the February 1 opening date, UCSF completed a colossal to-do list:

- 40,000 pieces of equipment installed
- 20,000 pieces of equipment tested and certified by clinical engineers
- 25 automated robots (right) programmed to travel safely from building to building
- 5 wireless networks installed, including a stand-alone child abduction network



Command Center

Physicians, nurses, police, and the City of San Francisco’s disaster planning manager staffed UCSF’s two command centers – at Mission Bay and Parnassus.

PHOTOS, FROM LEFT: TOM SEAWELL; NOAH BERGER

PRACTICE MAKES PERFECT

Becoming fully operational in a new medical center takes more than studying floor plans and organizational charts. It takes rehearsal – early, often, and on location. To ensure they could function safely and tactically in the new space, more than 800 clinicians and other staff participated in a series of three “day in the life” rehearsals at Mission Bay.

During the first exercise, clinicians and staff practiced transporting a critically ill newborn via helicopter, with a doll playing the starring role. Bear Force One, a helicopter that flies seriously injured or ill newborns, children, and pregnant women from outlying hospitals, landed safely on the rooftop helipad, the only hospital helipad in San Francisco. A UCSF nurse pushing the “newborn” in an Isolette, dashed out from beneath the beating blades. The staff were timed as they made their journey from the pad to the neonatal intensive care unit.

“We discovered that certain paths of travel didn’t have automated door openers, so teams were crashing through,” says Pamela Hudson, executive director of clinical systems and of the Mission Bay transition. “Clearly, more of the 3,500 doors in the facility needed to be automated, so we installed more to cut down on patient transfer time.”

Over the course of the three day-long exercises, staff and faculty ran five mock moves and rehearsed 177 scenarios. “By the third ‘day in the life,’ they had cemented all they learned,” says Hudson. “Supplies were

“People realized this was history in the making: the first free-standing children’s hospital in San Francisco. I cannot tell you how many people volunteered to ready Mission Bay. It was a labor of love.”

– Kim Scurr

in the right location. Everybody knew where the crash cart was in case someone had a heart attack or respiratory event. We were ready.”

“Patient safety was our top priority during the patient move, along with minimizing disruption to our neighbors. We achieved both goals, thanks to the superb work of our medical center faculty and staff, as well as our partners in the City of San Francisco,” says Mark Laret, CEO of UCSF Medical Center and UCSF Benioff Children’s Hospitals. “We were looking forward to February 1 for some time, and the opportunity to start providing care in our new location at UCSF Mission Bay.”

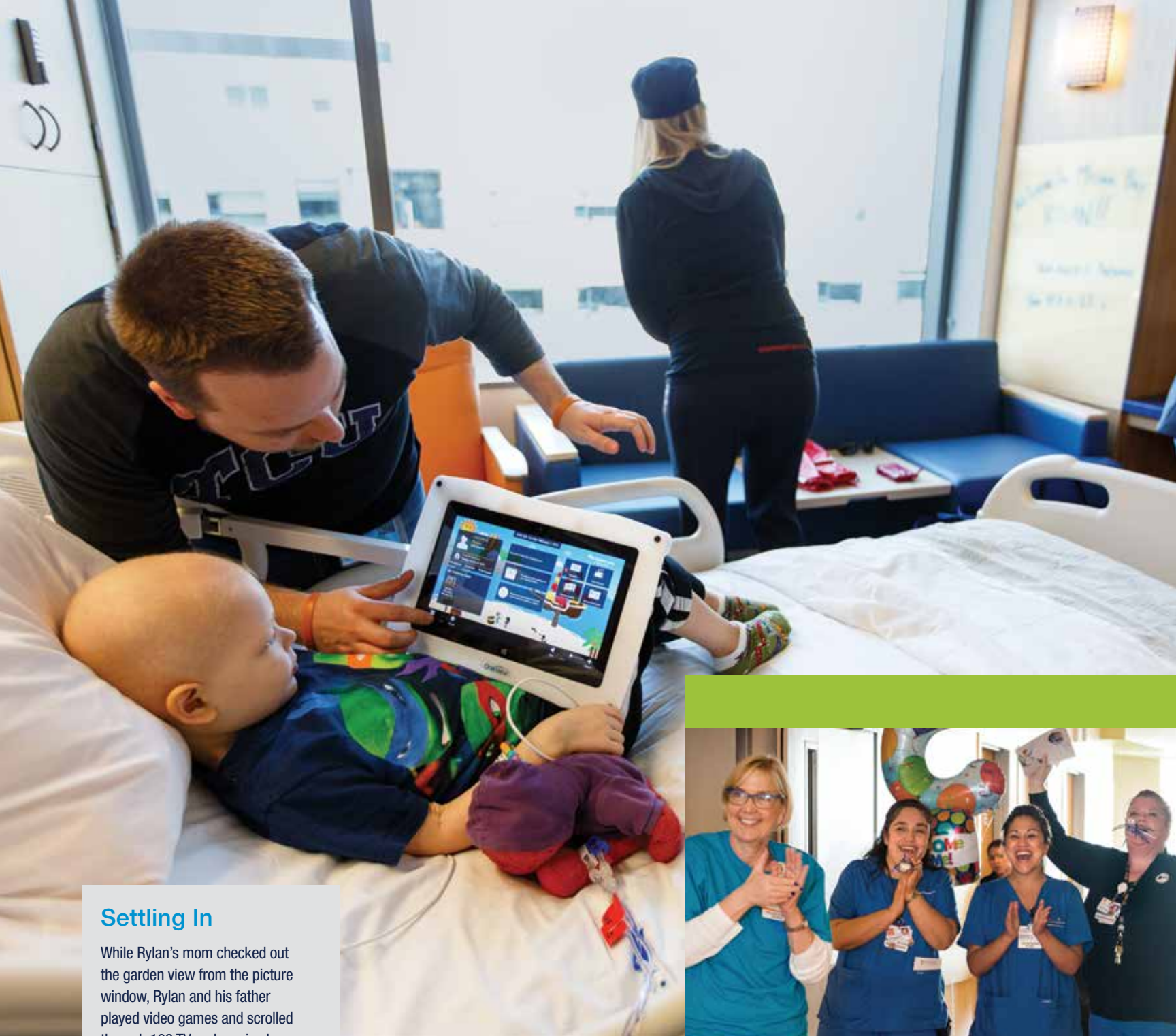
➤ 3.3 million feet of drywall, enough to stretch from Mission Bay to Yosemite if laid end to end ➤

Landing

Housed at Oakland International Airport, Bear Force One has a dedicated team of pilots, mechanics, and nurses who transport critically ill newborns, children, and pregnant women from outlying hospitals to the medical center’s rooftop.

PHOTO: PAUL SAKUMA





Settling In

While Rylan's mom checked out the garden view from the picture window, Rylan and his father played video games and scrolled through 192 TV and movie channels on the OneView. Displayed across the room on a 65-inch monitor, OneView also engages patients in their care. They can interact with their care team, see lab and imaging results, and learn about upcoming procedures. Patients can even Skype with teachers or loved ones.



Homecoming

Four nurses welcomed the final transferred patient at 3:32 p.m. — all 131 were safe and sound!



Compose

Oliver Jacobson, a music therapist at UCSF Benioff Children's Hospital San Francisco, wrote an opening-day song for the occasion.



► 1,783,000 pounds of ductwork, enough to make three 747 airliners ►



PHOTOS, FROM LEFT: STEVE BABULIAK, DEANINE FITZMAURICE

RAISING OUR SIGHTS

"I loved watching the kids' faces as they came through the doors," says Michael Towne, manager of Child Life Services. "They were wide-eyed and excited, taking in all the color, the light, the space."

Children and teens entered a zone built especially for them – a place where kids can do more than endure and heal from an illness. The hospital features a creative arts studio with art therapists and artists-in-residence who can help children and teens immerse themselves in poetry, dance, music, painting, crafts, or performances – to either escape from or find meaning in what they are going through.

In a broadcast and digital studio, kids can create music, films, or news programs that can be aired throughout the complex. There is a playroom for younger kids and a teen room equipped with foosball, crafts, board games, and video games. Each space is designed to foster creativity and interaction.

Adults have access to outside spaces, meditation rooms, and art therapy studios, so they, too, can delve

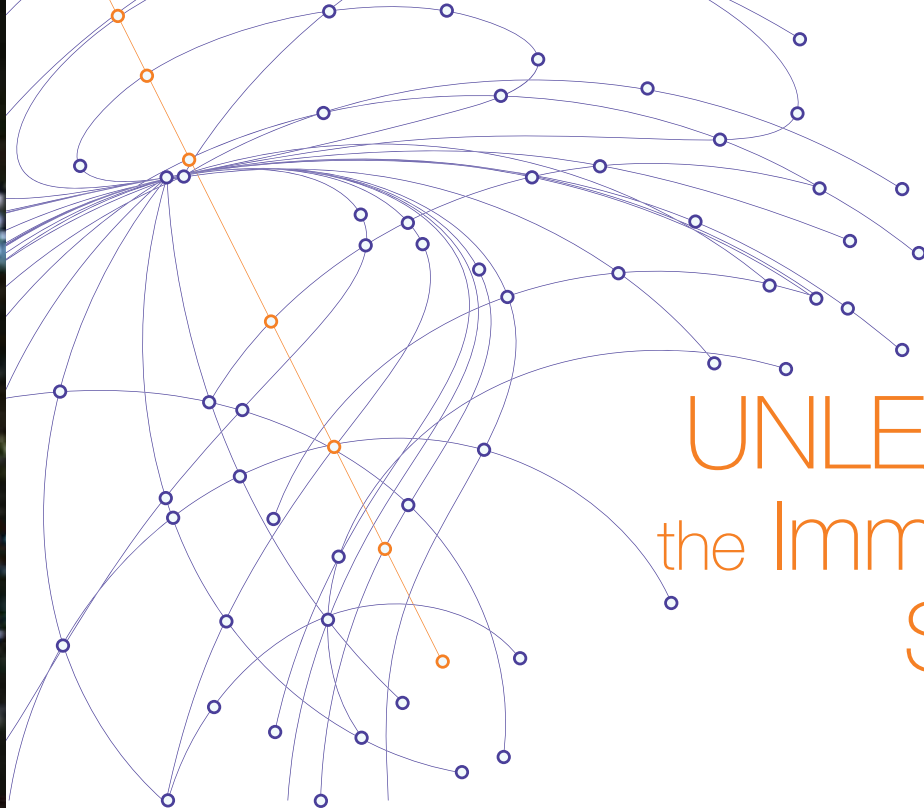
deeply and privately into healing and meaning. "Many hospitals have some of our programs, but none have all of them," says Towne. "There is something about the synergy we have created here. I am so excited to see how it changes the experience of their illness."

Towne recalls a former patient with a long, complicated illness. She had rejected piano lessons forced on her in early childhood. A child life specialist brought her a keyboard. Now, years later, she is a singer-songwriter. "She told me that her illness was her gift. She found herself as a person, with a voice and a passion for life, because of it," says Towne.

In a new space – where so much thought, creativity, and state-of-the-art resources have been brought to bear on child and adult patient care – the experience will no doubt be all the more transformative. "I think the crucible of illness is fear. It's scary to be sick," says Towne. "What we are doing here is giving patients ways to do more than just get through it. With art or music, they may discover who they are." ■



FAMILY TIME: Patient Michael Agnew went from facing advanced melanoma to feeling great and spending more time with his grandkids.



UNLEASHING the Immune System

Oncologists are treating the immune system instead of tumors to fight cancer – with startling results.

By Wallace Ravven

It didn't take Adil Daud, MD, long to realize that something unusual – unusually good – was happening to his patients. He was leading a clinical trial of an experimental drug against metastatic melanoma, the most deadly form of skin cancer. The trial was a phase I study, designed to examine the drug's safety, not its effectiveness. But Daud couldn't ignore its dramatic effect.

This was a last hope for his patients, since all other treatments had failed to slow their tumors. The drug, known by the unwieldy name pembrolizumab, had been designed to unleash the immune system against the cancer – a strategy with a history of only modest success, but one for which many oncologists have high hopes.

"We could see almost from the start that we had some really impressive responses," says Daud, director of Melanoma Clinical Research at UCSF's Helen Diller Family Comprehensive Cancer Center. Within a few weeks of the trial's spring 2012 launch, more than 30 percent of participants' tumors were shrinking – a threefold improvement over other immunotherapies for advanced melanoma. Oncologists at the clinical trial's 11 other sites were seeing similar results.

"No other immunotherapy causes tumors to shrink in such a high percentage of patients, and these are lasting responses," explains Daud, three years after the drug's effect first became evident. The drug works by inhibiting a protein called PD-1, an approach he calls "a game-changer."

Michael Agnew offers living proof of that fact. Now 69 and retired after a 30-year career with the California Highway Patrol, he was diagnosed with melanoma in 2005.

**This drug,
treats the
immune
system,
not cancer,
so drug
resistance
won't
develop.**

Surgeons successfully removed a tumor from his nostril, and he had seven apparently cancer-free years. But the cancer had metastasized; in 2012, a chest X-ray revealed a mass in his lung.

Chemotherapy at UC Davis Medical Center in Sacramento wasn't effective. "It seemed to be chasing the cancer around," Agnew says. A walnut-sized tumor in an adrenal gland narrowed his options. Then his Sacramento oncologist told him about the UCSF trial to block PD-1.

"I was in stage 4. I was the last or second-to-last to get in the program in that series," he says. "This trial has been a godsend.... The tumor is now the size of a pea." (Daud even suspects the remaining mass may be a residual scar rather than cancer.)

People with untreatable late-stage melanoma rarely live more than a few months. But about 80 percent of those who responded to pembrolizumab are still doing well, two years on. Some have even been deemed cancer-free.

"With this drug, you are treating the immune system, not cancer," explains Daud, "so drug resistance won't develop. We think this type of drug is allowing the immune system to control cancer as if it were a chronic infection. Tumors might not disappear, but they can remain small and manageable."

Furthermore, the drug is easy on Agnew's body. "I don't have the debilitating joint pain and other side effects I had with the other drug," he says. "The biggest problem is fatigue the day after the infusion, but it's not really serious."

And Agnew isn't alone. Daud and his fellow investigators have been impressed by how few patients have suffered the severe side effects of other immunotherapies, such as colitis and hepatitis. The most common secondary reactions to pembrolizumab have been fatigue, cough, joint aches, and rashes, though a small percentage of patients have experienced serious complications.

"Immunotherapy can be nontoxic, and its beneficial effects can potentially be long-term," says Lawrence Fong, MD, associate professor and a leader in cancer immunotherapy at UCSF. "That's transformative for cancer therapy."

The startling results were so promising – and melanoma patients' other options so limited – that in September 2014, the FDA gave accelerated approval for using pembrolizumab against advanced melanoma that hasn't responded to other treatments. Approval is rare for drugs not yet tested in large phase II and III trials. Pembrolizumab is now being marketed by its manufacturer, Merck, under the more user-friendly name Keytruda.

Patients in the trial, which is still ongoing, receive half-hour infusions of Keytruda every two weeks at Diller Cancer Center. Agnew and his wife, Carol, are able to drive down

from Sacramento and back the same day. The current plan is to continue his treatments for six more months.

He's one of the lucky ones, but he's not a rarity. "I feel very, very fortunate for where I am now," he says. "I go on day motorcycle rides with my friends again. We have an RV, and Carol and I take trips for days at a time. I garden. The things that retired people do. I feel great."

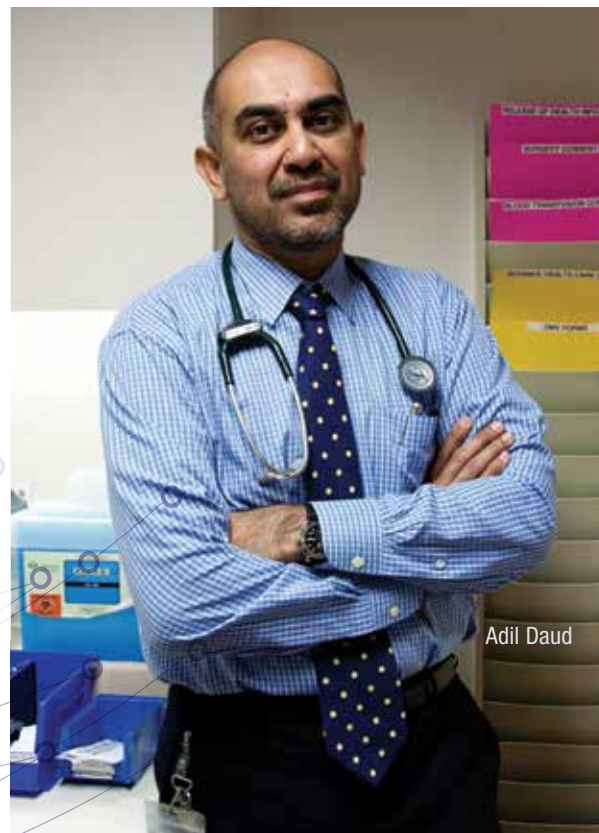
The trial's outcome has helped spawn dozens more trials pitting pembrolizumab against other types of cancer. It is now, often in combination with other drugs, shrinking advanced cancers of the lungs, bladder, and kidneys, as well as certain types of breast cancer.

Using it with other drugs appears to have a stimulatory effect on the immune response, Fong says, boosting its ability to kill cancer cells. Daud thinks combination treatments might ramp the success rate up to 60 percent.

Deploying the Army

T cells, the aggressive soldiers of the immune system, attack infected cells in the body and demobilize invading pathogens. To prevent indiscriminate killing of normal cells, the immune system employs molecular "brakes" to restrain the army in the presence of "self" cells and tissues. (A failure to apply these brakes is what triggers autoimmune diseases like multiple sclerosis.)

But cancer is not a foreign invader. Tumors are mutated versions of the body's own cells. They don't



Adil Daud

PHOTO: CINDY CHEW

“look” abnormal to the immune system, so the brakes go on. Unimpeded, the cancer spreads.

One of T cells’ molecular brakes is controlled by the PD-1 protein. If it links to another tumor-cell protein, PD-1 turns off the T cells. But Keytruda blocks the two proteins from connecting – essentially cutting the brake line and freeing the T cells to attack the tumor.

Keytruda is the second “brake-releasing” drug approved against melanoma. The first – Bristol-Myers Squibb’s Yervoy, which blocks a different immunological protein – was approved in 2011. It has succeeded in a smaller percentage of patients and causes more serious side effects, but, like Keytruda, has achieved impressive, lasting tumor suppression.

Not surprisingly, early word of Keytruda’s tumor-shrinking powers in the clinical trials has led to an explosion of interest among drugmakers. Three other companies are now running trials of different drugs that inhibit PD-1. One was approved in December. And Genentech is conducting trials targeting PD-1’s partner protein.

More than 30 other immune proteins besides PD-1 may help turn T cells on or off, Fong says. He estimates that at least 10 are already in trials. And, he adds, “every six months I see new targets that companies are going after. It just gets bigger and bigger.”

He, Daud, and others are also studying why only certain patients respond to such treatments. Fong’s lab is trying to understand at a molecular level what T cells “see” when the immunological brakes are released. And Daud recently found that 30 percent of participants, all of them among the cohort that did not respond well in the trial, lack a key protein involved in blocking PD-1. Such patients may benefit from emerging drugs that free the molecular brakes in other ways.

Three years after he first observed the effect of targeting PD-1, Daud has high expectations for unloosing the body’s T cells against cancer. “I’m predicting that in 10 years, every cancer treatment regimen will have some immunotherapy component – whether aiming at PD-1 or another immune protein target. It will be part of the toolkit.”

No other immunotherapy causes tumors to shrink in such a high percentage of patients, and these are lasting responses.



Alan Ashworth (left)

CONSPIRING AGAINST CANCER

Q&A with UCSF's New Cancer Center President

One of the world’s preeminent cancer scientists, Alan Ashworth, PhD, assumed leadership in January of UCSF’s Helen Diller Family Comprehensive Cancer Center. Ashworth studies genes involved in cancer risk and was a key player on the team that discovered the BRCA2 gene, which is linked to a heightened risk of breast, ovarian, and other cancers. He went on to develop a treatment for BRCA1- and BRCA2-related cancers that was recently approved by the FDA. Before coming to UCSF, Ashworth served as chief executive of the Institute of Cancer Research, London.

What brought you to UCSF?

I saw this position as a fantastic opportunity to make a difference. UCSF has always been a place I’ve enjoyed visiting. I like the scale and breadth of it, the excellence, the feeling of entrepreneurship. The new Bakar Cancer Hospital at Mission Bay was also one of the major drivers in my coming here – it will allow for a totally seamless integration between clinical programs and research in a stunning new facility.

Additionally, there are a lot of emerging technologies being developed here in the Bay Area that I’m looking forward to tapping into. I believe partnership between academia and industry to be crucial to developing the next generation of cancer therapies and diagnostic tools.

What’s your vision for tackling the disease?

I want to accelerate the movement from insights to therapies and cures by facilitating increased collaboration among basic, translational, and clinical scientists. This is how we’ll ultimately cure the disease, and if we’re not in the game to do that, what are we doing?

Where do you see the fight against cancer in 10 years? 20?

History proves that predicting exact timelines in this area is a tricky business.

I would say that we will first see much better and more long-term disease control. A smorgasbord of therapies – conventional therapies, new targeted drugs, and immune therapies – will be increasingly used in rational sequential and combination strategies. This will initially result in the stabilization of advanced disease, plus more cures of early-stage disease. We should also eventually see cures of some lethal advanced cancers. And methods of early detection will become much more efficient. Finally, pinpointing cancer risk and prevention will rightly be getting much more attention. — Kathleen Masterson





CATCHING Dreams

The towering steel sculpture “suggests the balance of hard work and aspiration that enables dreams to take flight,” according to its creator, renowned artist Mark di Suvero.

Four giant legs rise to a vertex, topped by several steel circles. Above them, four beams fan out from one another like the fingers of a splayed hand, rotating slightly in the wind on low-friction bearings. *Dreamcatcher*, di Suvero named it.

UCSF board member Jeanne Robertson was captivated by *Dreamcatcher* when she first saw the piece in the San Francisco Museum of Modern Art exhibition of di Suvero’s work at Crissy Field. Knowing the exhibition would be dismantled in spring 2014, she began thinking how perfect *Dreamcatcher* would be for UCSF’s Mission Bay campus.

Resembling a telescope, or maybe a compass, moving in a manner suggesting pursuit, or perhaps discovery, *Dreamcatcher* seemed a perfect fit conceptually for UCSF’s main research campus. When the exhibition closed in May 2014, Robertson and her husband, Sandy, longtime supporters of Mission Bay and of UCSF’s commitment to public art, purchased the 50-foot-tall, 15-ton steel sculpture and donated it to the university. The massive artwork was disassembled into 11 pieces and put into storage while a Mission Bay site was prepared. In early January 2015, a crane hoisted *Dreamcatcher* over the trees and into its permanent home on Koret Quad.

UCSF’s commitment to public art dates back decades. Dozens of paintings, sculptures, statues, and other works dot our Parnassus campus, and when planning for Mission Bay began in 1999, then-Chancellor J. Michael Bishop, MD, pledged 1 percent of construction costs to create a premier public art program there.

Those funds have been used to purchase or commission works by more than 50 artists. UCSF named the collection, called by the *San Francisco Chronicle* “one of San Francisco’s most ambitious public collections of contemporary art,” in Bishop’s honor.

“*Dreamcatcher* is a magnificent piece of art that will forever grace our Mission Bay campus and inspire generations of students and faculty,” says Chancellor Sam Hawgood, MBBS. “The name itself wonderfully captures the very spirit and intention of UCSF: to dream the impossible and then catch the dream. Our mission at UCSF is to improve the health of the world – a dream very much worth catching.”

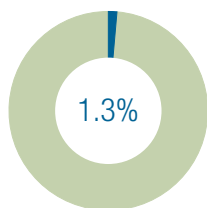


Science Interrupted

How young investigators must
sideline science to compete
for scarce funding.

By Claire Conway

ILLUSTRATION: RICHARD MIA



Today's proportion
of NIH grant funds
awarded to labs headed
by researchers under the
age of 36: 1.3 percent

WHEN YOUNG INVESTIGATORS START THEIR FIRST LABS, their fresh ideas blow open new territories of science. While finding funding to support their work has always been challenging, young scientists now spend considerably more time applying for grants just to keep their new labs afloat – leaving much less time for research. Scrambling from bench to desk and back again, they vie exhaustively for a shrinking sliver of the funding available from their primary patron, the National Institutes of Health (NIH), a stalwart supporter of science that has endured turbulent budgetary swings of its own.

The pressure is inescapable, even at UCSF, where all four schools – dentistry, medicine, nursing, and pharmacy – have ranked first in their fields in NIH funding for two years running. That's a feat that strikes chords of gratitude and pride at a public institution without a deep cushion of state support or the endowment of competing private universities. Even from UCSF's unique vantage point atop the federal funding pyramid, a fissure is apparent – one wide enough for young investigators at the height of their creativity to fall through.

Is the competition so fierce that the next generation of academic scientists – and, by extension, science itself – may be at risk? That's a question being asked by scientists and policymakers throughout the country. The National Academy of Sciences (NAS) is leading the way with a deep reassessment of how health science research is funded in the U.S.

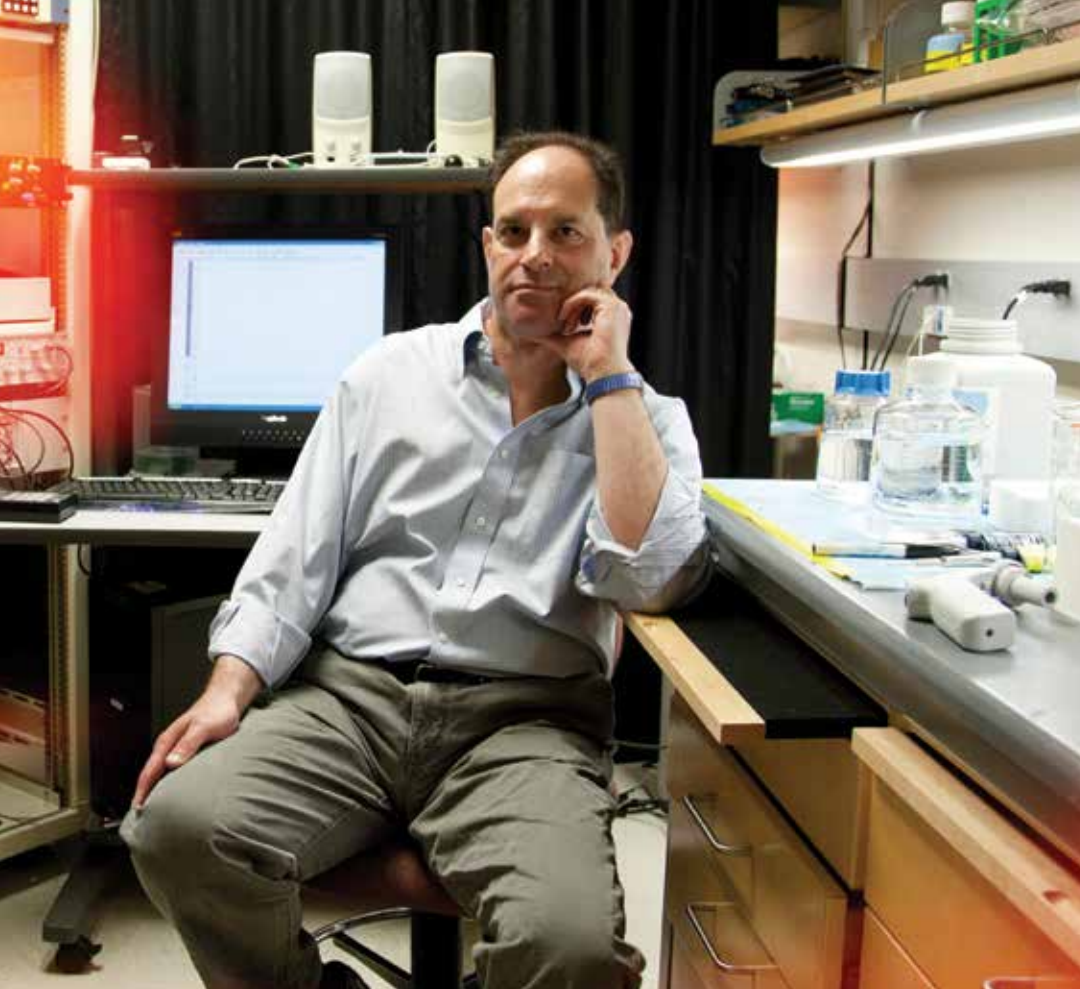
Statistics tell the stark story of a national scientific funding milieu in flux. Fundamental to the numerical narrative is the NIH budget; it dropped by almost \$5 billion in buying power due to inflation between 2003 and 2013, according to the journal *Science*. Against this grim financial backdrop, many institutes at the NIH now fund just over 10 percent of all grant applications, less than half the percentage funded in 2000. If you look only at young investigators, the odds are even more startling. In 2012, only 1.3 percent of total NIH grant dollars were awarded to principal investigators, meaning heads of labs, who were under 36 years old.

"The funding pool is so small that, at the end of the day, it's not a big leap of faith to say that a lot of excellent science is not being funded," says Dena Dubal, MD, PhD, a young physician-scientist specializing in dementia. She spends a significant part of her time applying to multiple funding sources to sustain her research.

Young investigators like Dubal are in the discovery zone, according to a Rice University study analyzing the work of Nobel Prize winners between 1980 and 2010. The 96 scientists who won the prize in medicine or chemistry for work related to biomedicine conducted their groundbreaking research at an average age of 41. Yet that explosively productive intellectual zone now bumps up against the most daunting financial hurdles of young investigators' careers.

"Consider how much less successful Silicon Valley would be if nearly 99 percent of all investments went to innovators who were 36 years old or older," says Bruce Alberts, PhD, a former two-term president of the NAS. A UCSF faculty member since 1976, Alberts holds the





David Julius thinks back to times when doing science wasn't so expensive.

“When you start making research decisions out of fear instead of optimism, then the pendulum has swung too far in the wrong direction.”

– *David Julius*

graduate students, and hire postdoctoral scholars to perform experiments.

Careers (and scientific progress) stall until young scientists receive that first R01. But in the current funding climate, researchers painstakingly apply – and are often rejected – again and again over the course of years. The process is so grueling that the NAS has been tasked with reassessing it. Alberts has written extensively on the process, using the term “hypercompetitive” to describe it. In the NAS’s investigation, these facts have emerged: The average age of scientists when they are first granted an R01 has crept up six years, to age 42, since 1980. Also, today, more than twice as many R01s are awarded to investigators over age 65 than to those under 36. In the mid-1990s, those figures were reversed.

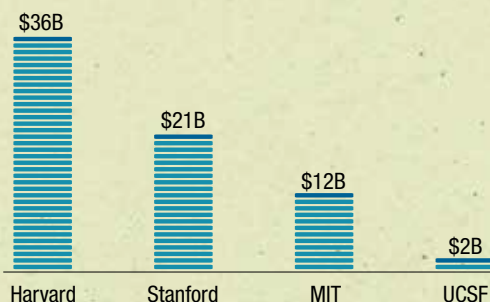
Some experts believe the age reversal is happening in part because many senior scientists have mastered the preparation of the quite daunting 200-page R01 application and have found a safe niche for funding. Others, including Alberts, believe that the NIH is using its dwindling dollars to fund mostly safe science, with a proven track record. Regardless of the cause, Alberts believes the shift away from investing in younger rather than older scientists has “tremendous” opportunity costs. “The very best young people should be put in a position where they can test their own ideas and do so in a system that incentivizes them to take risks and try different approaches,” says Alberts.

Chancellor’s Leadership Chair in Biochemistry and Biophysics for Science and Education.

This is not to say innovation ends at 40. A recent study published by the U.S. National Bureau of Economic Research found that the younger the researcher, the more likely he or she is to publish innovative work. Yet pairings of young researchers with more seasoned investigators were the most innovative of all.

COVETED COFFERS

The crux of the young investigator’s problem lies in the quest for the golden ring of funding – an NIH grant known as the R01. Awarded after a series of training grants, the R01 is a major rite of passage that establishes young scientists as independent investigators, rather than associates being supported by the R01s of their faculty mentors. They are far larger than training grants, enabling young scientists to set up their own labs, buy equipment, recruit



Endowment Totals: UCSF’s focus on philanthropy began in the late ’80s and has since intensified to compensate for lost state support – now 4.6 percent, the lowest in the UC system – and the increasingly fierce competition for NIH funds.

THE NEW MATH

David Julius, PhD, the chair of physiology at UCSF, was 42 when he discovered the molecular mechanisms by which skin senses pain. The finding earned him the Shaw Prize, which is considered to be a shortlist for a Nobel Prize. Julius' first R01 came at the age of 35. It's tough to know whether he could have made the same headway under current economic conditions, he says. First, there are a lot more people in the field, and the competition for grants and faculty positions is far more intense. In addition, comparing the cost and process of conducting science today with the situation a decade ago is inherently fraught. "Now, scientists want to and are expected to do things that cost a lot more money, such as studies involving mice genetics and technologies like genetic sequencing and imaging," says Julius. "Technology has upped the ante so much that you need more than one grant to run a lab now."

Likewise, salaries for investigators and postdoctoral scholars take an enormous bite out of grant budgets, far more than they used to. "One of the big attractions of coming to the University of California used to be that the state would guarantee a big part of your salary," says Julius. "But the state has cut back, and those positions are eroding."

Take UCSF's Department of Medicine. It has close to 775 faculty members, yet its chair, Talmadge King, Jr., MD, has only 45 positions that come with significant funding from the state. "In the '80s, we would try to get investigators more secure funding after they had successfully obtained an RO1," recalls King. "Back then, almost everyone in that category had some state-funded support."

State funding has dropped precipitously since the year 2000, when UCSF received 13.7 percent of its

budget from the state. In 2013, 4.6 percent of the budget came from Sacramento. It is the lowest percentage of any UC campus because state funding is used predominantly for salaries of undergraduate educators and UCSF is a graduate-level institution. Therefore, UCSF is left to its own devices to bridge salary gaps.

As is typical of most health science universities, UCSF guarantees newly appointed faculty their salaries for only three years. If they are clinician-scientists, their job description entails spending 75 percent of their time doing research. They spend the remaining 25 percent of their time doing fee-for-service work in the clinic, seeing patients. "After those three years, most faculty members are responsible for virtually every dollar of their salaries," says King, by either bringing in grants or seeing patients.

"I was in my 30s when I got my first NIH grant," says King. "Having to wait until age 40 or over for your first RO1 is stressful. Faculty are living under the threat of not being able to cover substantial student loans, housing, or child care, if they have families."

And scientists aren't out of the woods after securing their first RO1. They must renew or reapply for these funds, which are granted in five-year increments, continually for the rest of their careers. "At year four of an RO1, suddenly the coffers are getting dry and you look around you and think, 'I can't support my lab staff,'" says Julius. "So these days, many investigators start cranking out grant after grant, throwing them against the wall, while hoping that something sticks."

Julius is keenly focused on retaining his postdocs and their core working knowledge of his lab. Yet once, during the governmental sequester of 2013, Julius, like his peers all over the country, thought a substantial part of his funding might not be renewed. "I could see the fear

Neuroscientist
Dena Dubal and
Department of
Medicine Chair
Talmadge King,
Jr., experience the
funding gap from
different vantage
points.



“The funding pool is so small that, at the end of the day, it’s not a big leap of faith to say that a lot of excellent science is not being funded.”
– *Dena Dubal*

in the faces of the people in my lab,” he recalls. “They thought, ‘Hey, if this is happening to him, what’s going to happen to me?’”

Anxious about funding shortfalls, some clinician-scientists leave for lucrative private practices, and some PhD scientists secure industry jobs with more reliable salaries. Or either may be lured away by other universities able to provide more financial security. Deep-pocketed schools with substantial endowments can offer scientists “packages” that insulate them from the funding treadmill.

GIFTED

Young neuroscientist and physician Dena Dubal was being courted by such a university when a private donor stepped up to keep her at UCSF. “Philanthropy has played a defining role in the discoveries made in the last three years by my very new and young lab,” says Dubal. That donor’s gift, in the form of the David A. Coulter Endowed Chair in Aging and Neurodegenerative Disease, fueled her lab’s discovery of *klotho*, a longevity hormone that boosts brain function. People with higher *klotho* have improved skills in thinking, memory, and learning. The hormone holds great promise for the treatment of dementia. The finding, published in prestigious journals, puts Dubal in a powerful place when applying for her next grant. “I would not have the resources to lead my lab at UCSF without David and Susan Coulter’s support, period,” she says.

Department chairs like Julius and King use philanthropic funds, such as those that underpin endowed chairs, as economic bridges for talented investigators who hit a dry patch in funding. The support helps the school’s leaders retain accomplished faculty and enables faculty to maintain their scientific momentum across funding cycles. But endowed funds such as these are usually restricted to purposes defined by their benefactors. Without a

large general endowment, UCSF has considerably fewer resources than peer institutions to recruit or launch the careers of junior faculty. To meet the need, the university is focusing its attention on ways to attract, support, and sustain promising young investigators.

TOWARD A NATIONAL PRIORITY

While philanthropy plays a crucial role, private support alone can’t free scientists to focus more on the task at hand: science. Leaders in the field see a need for systemic change at the national level. Alberts advocates programs that favor innovation and risk-taking over momentum. “I would explicitly incentivize funding the best young scientists by expanding the NIH’s New Innovator Program,” he says. “It’s a very small program, about 30 to 50 grants a year, that doesn’t require preliminary data. We should expand it tenfold.”

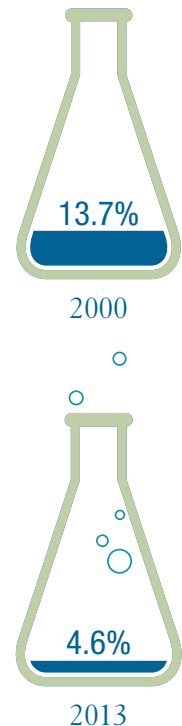
Julius sees universities as the potential stabilizing force in the field. “Universities need substantial funds to shore up support for faculty salary and benefits,” he says. “We need to provide security to investigators and make it easier to recruit junior investigators, because they will see hard money in their futures.”

Janet Napolitano, president of the University of California, would agree. She is pressing California Governor Jerry Brown to increase funding to the UC system, particularly in light of a \$1-billion increase in the 2015-16 state budget.

King and Dubal also look inside the Beltway for answers. “I think if we, as a country, figure out how to control student debt, it would alleviate a lot of pressure for young investigators still paying off student loans,” argues King. Dubal wonders when the federal funds given to the NIH will increase to match the value of discovery in the health sciences to our nation and to the world. “The upcoming epidemic of Alzheimer’s disease and the lack of solutions are some of our most pressing biomedical problems,” she explains.

In writing grant applications for the NIH, other government funding agencies, and private philanthropies, scientists have learned to better distill and “sell” the importance of their work. Perhaps this newly acquired skill will empower scientists to step out of their comfort zone of labs and lecture halls and advocate at a national level for the importance of science itself.

There’s plenty at stake, to be sure. Think about it: Dubal spearheaded the *klotho* discovery with the gift of time afforded by private support. As a young investigator in a nation facing a tidal wave of dementia, Dubal’s research has already had a profound impact. A worthy investment indeed.

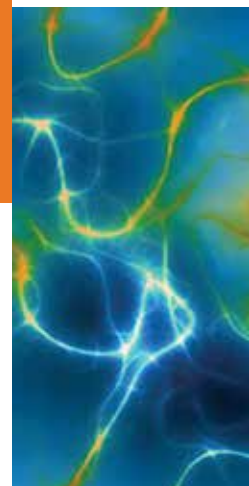


State funding to UCSF declined steeply between 2000 and 2013.



President Barack Obama greets UCSF Vice
Chancellor for Research Keith Yamamoto

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150YRS**



Steeped in Service

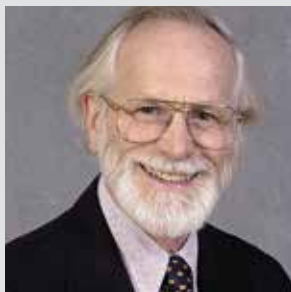
With sweeping reach, these luminaries are combating tobacco use, exciting kids about science, making medicine safer, advocating for the underserved, keeping our troops healthy, and much more. UC San Francisco faculty and alumni called to public service stand as an especially impressive manifestation of UCSF's public mission. In honor of the university's 150th anniversary, we highlight but a few whose national and international leadership roles have helped set the world on a course to better health.

by Abby Cohn

PHOTOS: STEVE BABULJAK, ANDY JACKSON; OFFICIAL WHITE HOUSE PHOTO BY PETE SOUZA

Nancy Adler, PhD, professor
Member, IOM Council, 1994-Present
 Serves on executive committee and co-chairs a committee asked to develop standards for inclusion of social and behavioral data in electronic health records.

Bruce Alberts, PhD, Chancellor's Leadership Chair in Biochemistry and Biophysics for Science and Education
U.S. Science Envoy, 2009-2011; President, NAS, 1993-2005
 At NAS, shaped landmark National Science Education Standards, emphasizing hands-on problem-solving, and championed their implementation in schools nationwide.



J. Michael Bishop, MD, professor and chancellor emeritus
Member, Medical Advisory Board, HHMI, 2009-Present; Member, National Cancer Advisory Board, 1994-2000 (Chair, 1997-2000); Nobel Laureate, 1989
 Advises HHMI leadership on strategies for promoting biomedical research and science education, proposals for new research programs, and other scientific matters.

Lewis Butler, JD, co-founder, Institute for Health Policy Studies
Assistant Secretary for Planning and Evaluation, HEW, 1969-1971; Country Director for Malaysia, Peace Corps, 1963-1964
 Established Peace Corps program in Malaysia; later helped promote concept of HMOs within HEW.

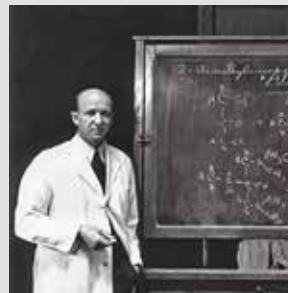


Richard Carmona, MD '79, MPH, resident alumnus
U.S. Surgeon General, 2002-2006
 Released a landmark 2006 report on the dangers of secondhand smoke that led to indoor smoking bans.

Vicki Chandler, PhD '83
Chief Program Officer for Science, Gordon and Betty Moore Foundation, 2009-Present
 Oversees support for innovative technologies, including an Earthquake Early Warning system and Hawaii's Thirty Meter Telescope, and for groundbreaking research.



Shirley Chater, MS '60, PhD, RN, former professor and vice chancellor of academic affairs
Commissioner, SSA, 1993-1997; Founding Chair, Executive Nurse Fellows Program, RWJF, 1998-2012
 Oversaw SSA's transition to an independent agency; responded to 1995 bombing of Oklahoma City federal building that killed 168 people, including 16 SSA employees.



Troy Daniels, PhD, former School of Pharmacy Dean
Head, American Pharmaceutical Association Delegation to Japan, 1949
 Led a post-WWII mission to help Japan rebuild its pharmaceutical education system.



Haile Debas, MD, professor and chancellor emeritus
Member, UN Commission on HIV/AIDS and Governance in Africa; Member, National Academies' Committee on Science, Engineering, and Public Policy; Chair, Membership Committee, IOM; Founding Board Chair, Consortium of Universities for Global Health
 Helped craft major UN report on threat from HIV/AIDS to governance in Africa; shaped IOM work on global health, chronic and infectious diseases, and education.

continued...

KEY

CDC

U.S. Centers for Disease Control and Prevention

FDA

U.S. Food and Drug Administration

HEW

U.S. Department of Health, Education, and Welfare

HHMI

Howard Hughes Medical Institute

HHS

U.S. Department of Health and Human Services

IOM

Institute of Medicine

NAS

National Academy of Sciences

NIH

National Institutes of Health

RWJF

Robert Wood Johnson Foundation

SSA

Social Security Administration

UN

United Nations

USPHS

U.S. Public Health Service

Italicized Name

Deceased

Robert Derzon, former administrator, UCSF Medical Center

Founding Administrator, Health Care Financing Administration (now Centers for Medicare and Medicaid Services), 1977-1978

Oversaw merger of federal health insurance programs for elderly and poor, Medicare and Medicaid, into single agency.



Sir Richard Feachem, DSc, PhD, professor and director, Global Health Group
Founding Executive Director, Global Fund to Fight AIDS, Tuberculosis and Malaria; and Undersecretary General, UN, 2002-2007

Oversaw Global Fund's evolution into a public-private partnership that has saved millions of lives in developing countries, raising more than \$10 billion to support 450 programs in 136 countries; knighted by Queen Elizabeth in 2007.



Susan Desmond-Hellmann, MD, MPH, resident alumna, professor, and former chancellor

CEO, Bill & Melinda Gates Foundation, 2014-Present; Trustee, HHMI, 2012-2014
 Leads foundation's efforts to address poverty and poor health in developing countries and to support educational innovation in the U.S.



Julie Gerberding, MD, MPH, resident alumna

Director, CDC, 2002-2009

Led federal agency through emergency responses to dozens of public health crises, including anthrax bioterrorism, SARS, West Nile virus, food-borne disease outbreaks, and natural disasters.



March Fong Eu, BS '43

Secretary of State, California, 1975-1994

Implemented voter registration by mail, pioneered online reporting of election results, and expanded voter outreach efforts.

William Gilbertson, PharmD '65

Director, Division of Over-the-Counter Drug Evaluation, FDA, 1977-1994

Implemented review of all over-the-counter (OTC) drugs to assure that they were safe, effective, and labeled for their intended use; promoted consumer-friendly OTC labeling.



Eric Goosby, MD '78, resident alumnus and professor

Ambassador-at-Large and U.S. Global AIDS Coordinator, 2009-2013; UN Special Envoy on Tuberculosis, 2015-Present

Oversaw dramatic increase in delivery of antiretroviral therapy to HIV-positive patients and sharp decline in infection rates among children; founded Office of Global Health Diplomacy in the U.S. Department of State.

Jere Goyan, PhD '57, former School of Pharmacy dean

Commissioner, FDA, 1979-1981

First pharmacist to serve as FDA commissioner; championed patients' right to be informed about prescription drugs.

John Greene, DMD, MPH, School of Dentistry dean emeritus

Deputy Surgeon General, USPHS, 1978-1981; Chief Dental Officer, USPHS

First nonphysician to serve as deputy surgeon general; helped devise Oral Hygiene Index to quantify bacterial plaque on teeth; exposed health risks of smokeless tobacco use by professional baseball players and others.



Victoria Hale, PhD '90

Founder and CEO, OneWorld Health, 2000-2008; Founder, CEO, and Board Member, Medicines360, 2009-Present

At OneWorld, first nonprofit pharmaceutical company in the U.S., led development and delivery of drugs for impoverished patients; at Medicines360, addresses need for contraception and other unmet health challenges faced by women.

Zach Hall, PhD, professor and executive vice chancellor emeritus

Director, National Institute of Neurological Disorders and Stroke, NIH, 1994-1997

Oversaw 700 intramural scientists and administrators plus external grant recipients; presided over major reorganization of internal and external research programs; initiated project that led to discovery of first gene for Parkinson's disease.

Sandra Hernández, MD, resident alumna

President and CEO, California HealthCare Foundation, 2014-Present; CEO, San Francisco Foundation, 1997-2013; Director, San Francisco Department of Public Health, 1994-1997

Has led efforts throughout her career to improve the health and overall welfare of Californians.



Ann Knebel, RN, PhD '90
Deputy Director, National Institute of Nursing Research, NIH, 2012-Present; Former Deputy Director for Preparedness Planning, Office of the Assistant Secretary for Preparedness and Response (ASPR), HHS, 2002-2012
 Champions research funding for nurse scientists; at ASPR, helped New York City develop bioterrorism plans and Greek government prepare for 2004 Olympics.



Philip Lee, MD, professor and chancellor emeritus
Assistant Secretary for Health, HHS, 1993-1997; Assistant Secretary for Health and Scientific Affairs, HEW, 1965-1969
 Helped to implement Medicare; chaired a task force on prescription drugs; developed health workforce and family planning policies.

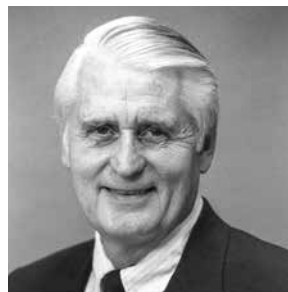
Erin O'Shea, PhD, postdoctoral alumna and former professor
Vice President and Chief Scientific Officer, HHMI, 2013-Present
 Directs HHMI's flagship Investigator Program, which funds more than 300 leading scientists nationwide, and Early Career Scientist Program.



Steven Schroeder, MD, professor
President and CEO, RWJF, 1990-2002
 Initiated and led programs to reduce smoking, enhance end-of-life care, expand health insurance for children, and encourage physical activity.



Pamela Schweitzer, PharmD '87
Chief Pharmacy Officer and Assistant Surgeon General, USPHS, 2014-Present
 In posts with Centers for Medicare and Medicaid Services, VA, and Indian Health Service, improved patients' access to pharmacy resources, oversaw IT advances, implemented pharmacy-by-mail services.



Lloyd "Holly" Smith Jr., MD, professor and associate dean emeritus
Member, President's Science Advisory Committee, 1970-1973; Member, Medical Advisory Board, HHMI, 1974-1995 (Chair, 1986-1995)
 Helped expand HHMI's support for investigators as it became nation's second-largest funder of basic biomedical research, behind the federal government.



Mark Smith, MD, MBA, resident alumna
Founding President and CEO, California HealthCare Foundation, 1996-2013; Board Member, Institute for Healthcare Improvement, 2013-Present
 Fostered innovation in health care delivery; improved access for underserved Californians.

Matthew Spitzer, MD, resident alumna
President, Board of Directors, Médecins Sans Frontières-USA, 2008-2012
 Raised awareness about organization's accountability, transparency, and neutrality in providing humanitarian medical care worldwide.

Harold Varmus, MD, postdoctoral alumna and former professor
Director, NIH, 1993-1999; Director, National Cancer Institute, NIH, 2010-2015; Co-Chair, President's Council of Advisors on Science and Technology, 2009-2010; Nobel Laureate, 1989
 Fostered doubling of NIH budget over five years; helped launch free online archive of scientific papers (now PubMed Central); co-founded Public Library of Science (PLoS).

Ted Wong, DDS '84
Chief, Army Dental Corps, 2010-2014
 Led Army units ranging from dental commands to multistate health systems serving more than 500,000 beneficiaries; oversaw programs, policies, and personnel for the Army Dental Care System.



Keith Yamamoto, PhD, postdoctoral alumna, professor, and vice chancellor
Member, Advisory Council to the Director, NIH, 2006-2010; Member, Coalition for the Life Sciences, 1995-Present (Chair, 2009-Present); Member, Board on Life Sciences, NAS, 2006-2012 (Chair, 2006-2012); Member, IOM Council, 2012-Present; Member, ResearchAmerica! Executive Committee, 2014-Present
 Has helped shape national science policy, advance field of precision medicine, drive support for scientific innovation; spearheaded concept of NIH T-R01 grants for bold, risky research projects.

Nonprofit Foundations Make Waves for UCSF Pediatric Cancer

Whether they're braving the shave, swimming the frigid waters of San Francisco Bay, or simply walking for a cure, several national nonprofit foundations – and the participants they inspire – bring much-needed financial support and visibility to pediatric cancer care at UC San Francisco.

UCSF Benioff Children's Hospitals benefit every year from organizations like St. Baldrick's, which hosts head-shaving challenges; Starry Night, which organizes walks to fight pediatric brain cancer; and Alex's Lemonade Stand, which was founded by a 4-year-old with neuroblastoma who dreamed of eradicating childhood cancer.

One of these foundations, Swim Across America (SAA), will commemorate an important anniversary of its collaboration with UCSF when its annual fundraiser returns to San Francisco this fall. Pediatric oncologist Robert Goldsby, MD, was just launching UCSF's cancer survivorship program in 2006 when he met SAA President and CEO Janel Jorgensen and told her about the funding challenges he was facing. Then and there, they formed a lasting partnership.

"Our clinic would not exist without Swim Across America," says Goldsby, now director of the Survivors of Childhood Cancer program at UCSF Benioff Children's Hospital San Francisco. Goldsby uses SAA funds to support patient services and his team's research on young cancer survivors, whose powerful treatments increase their risk for secondary cancers later in life. SAA proceeds also fund the work of UCSF Benioff Children's Hospital Oakland pediatric oncologist Julie

Saba, MD, PhD, who investigates novel, safe, and targeted therapies for children with cancer.

The first Swim Across America San Francisco event in 2006 brought out 60 swimmers and raised a total of \$65,000. By 2014, the event's numbers had blossomed to 275 swimmers, 60 kayakers, 100 volunteers, and a total take of \$450,000. In all, SAA has raised more than \$2 million for UCSF Benioff Children's Hospitals and, through similar events nationwide, \$60 million for cancer research and care generally. Past and current Olympians join the Bay Area swim to give the event star power and, that same weekend, spread cheer by visiting young cancer patients in the hospital.

"This is more than just a swim or a fundraiser," says Susan Helmrich, SAA San Francisco co-director and a three-time cancer survivor. "It empowers us to do things we didn't know we were capable of doing."

This year's event will take place on Sunday, Sept. 27, when bay waters are at their warmest (but still really cold!). Swimmers will board the San Francisco Spirit at Pier 3 and head out to the Golden Gate, where they will take the plunge for the 1.5-mile swim to Little Marina Green. Volunteer swimmers and kayakers patrol the waters in case anyone needs assistance, and novices can take a shorter, alternate route.

Want to swim or donate this year? Google "Swim Across America San Francisco" to learn more.

— Patricia Meagher



PHOTO: KARLE J. FRIED



Alumni Hub

On this page, we highlight two signature alumni programs from UCSF's 150th anniversary celebration: the Alumni Excellence Awards and UCSF on the Road. In the pages that follow, we demonstrate how alumni are making a difference in faraway places. We also share stories of other notable alumni, all of whom helped host a UCSF on the Road event this past year.

150TH ANNIVERSARY ALUMNI EXCELLENCE AWARDS

To mark UCSF's anniversary, the Alumni Association, University of California San Francisco (AAUCSF) has honored 150 alumni with Alumni Excellence Awards. Recipients were chosen from nearly 900 anonymous nominations for their distinction in the major components of UCSF's mission – education, patient care, research, and service – as well as business and industry.

625 combined years (and then some) that recipients spent at UCSF

1911  **1980** 

Birth years of the oldest (Ephraim Engleman, MD, resident alumnus) and youngest (Benjamin Chaffee, DDS '08) recipients

10,368

Miles from San Francisco to Gaborone, Botswana, hometown of Naomi Seboni, PhD '93, recipient who lives the furthest distance from UCSF

3
Nobel laureates

32
Business leaders

61
University leaders

16
Inventors

For a list of recipients, please visit
www.ucsfalumni.org/award150

UCSF ON THE ROAD

UCSF took its 150th anniversary celebration on the road, beginning in Seattle last August and finishing in Silicon Valley in April, introducing and reuniting alumni all along the way.

700+
Alumni attended



7
Campus executive leaders presented



John Featherstone, PhD

B. Joseph Guglielmo, PharmD,
resident alumnus

Regis Kelly, PhD

Catherine Lucey, MD,
resident alumna

Kimberly Topp, PhD,
postdoctoral alumna

David Vlahov, RN, PhD

Elizabeth Watkins, PhD

Graduation years of attendees spanned seven decades, from

1945 to 2015



11 cities
visited

Beverly Hills
Boston
Fresno
Irvine
New York
Pasadena

&

11,722
miles traveled

Sacramento
San Diego
Seattle
Palo Alto
Washington, D.C.

SCHOOL OF DENTISTRY

ALI ATTAIE, DDS '03

Hometown: Tehran, Iran

Now: Brooklyn, New York

Position: Co-founder and president of hellosmile

Hobbies: Photography, Persian calligraphy, working out

SADI KERMANI, DDS '03

Hometown: Kerman, Iran

Now: Brooklyn, New York

Position: Co-founder and director of orthodontics at hellosmile

Hobbies: Tennis, music, Bikram yoga



LEFT TO RIGHT: Ali Attaie, Sadi Kermani

Ali Attaie and Sadi Kermani say their paths were fated to cross at UCSF. Now the two classmates and friends are also business partners, building an uncommon dentistry practice. Their endeavor, hellosmile, provides access to high-quality care for the underserved and emphasizes patient education, prevention, and hiring from the local community.

“We were honored to have Dean [John] Featherstone come to New York for last December’s UCSF

on the Road tour,” says Kermani, who co-hosted the event with Attaie and others. “He talked about UCSF being number one not just in dentistry but in all areas, and he stopped by one of our offices to see how we’re putting his teachings into action.”

PREVENTION WORKS: With seven offices in the Bronx, Brooklyn, and Queens, hellosmile is based on a social entrepreneurship model, which applies a business approach to effect social change. Alongside Attaie’s

younger brother, Farhad, they are building a sustainable model of care they hope can be applied in other locations, including San Francisco and perhaps even their native Iran.

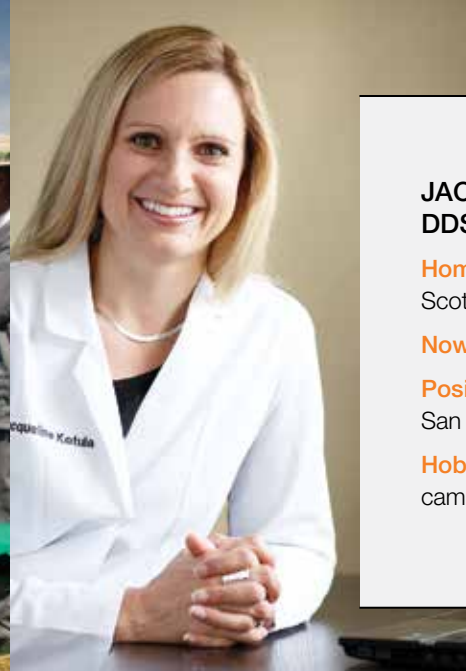
“We come from relatively modest means ourselves, so we know the importance of access to good oral health for the underserved,” Attaie says. “The dental industry has not been able to figure this out, but we have found that prevention can work as a business model, even among the underserved and those with severe disease.”

UCSF INSPIRED THEIR PASSION:

The two credit their UCSF experience – in particular, an invitation-only leadership class

taught by then-Dean Charles Bertolami, DDS, DMedSc – with inspiring their passion for making dental care more accessible. Attaie also witnessed “horrible disparities” in care during his first year of practice, when he worked in one dental office on the affluent Upper East Side and another just five subway stops away in poorer Queens. “I thought there had to be a better way,” he says.

Last year, Kermani moved from San Francisco to New York City to take a more active role in the practice and now says he has found true job satisfaction in treating patients most in need. “I love my work,” Kermani says. “Every patient I see is a beautiful soul.”



JACQUELINE KOTULA, DDS '09

Hometown: Glasgow,
Scotland

Now: San Rafael, Calif.

Position: General dentist,
San Rafael

Hobbies: Hiking, bicycling,
camping, paddleboarding

"I have never gotten so much from giving so much," says Jacqueline Kotula of the almost six-year stint she spent providing essential dental services to the indigenous people of rural Peru.

WANDERLUST: In the late 1990s, Kotula, a University of Glasgow dental graduate, longed for a

change of scenery. She headed to Peru, initially for a three-week vacation, and she fell in love with the place. Quitting her well-paid dentist job in Glasgow, she back-packed her way through Central and South America before finding an unexpected calling in the mountainous Apurímac region of south central Peru. There, she encountered some of the poorest

people in the country, living with limited access to basic services like running water, electricity, maintained roads – and dental care.

DENTIST ON THE MOVE: With approval from the Peruvian authorities and armed with rudimentary dental equipment donated by her professor of oral surgery in Glasgow, Kotula set off for some of the remotest villages. She traveled by truck, bus, quad bike, horse, and foot, pulling teeth along the way. Adults and children journeyed vast distances to reach the health posts where she worked, including one 82-year-old woman who walked five days to obtain relief from a mouth abscess.

PHILANTHROPY

HELPS: Realizing the enormity of the demand for services, Kotula eventually founded Dental Project Peru, a Scottish charity, which enabled her to raise funds for additional

equipment and future expeditions. Before relocating to the United States, she achieved one of her ultimate goals – introducing a fluoride-based prevention program in the schools.

FURTHER EDUCATION:

In 2006, Kotula and her American husband, Clark, whom she met on her travels, left Peru and settled in Northern California. Kotula enrolled in the two-year International Dentist Program at UCSF, designed for foreign-trained dentists who wish to practice in the United States. "The UCSF course was hard work, but it helped me get back into advanced dentistry," Kotula says.

A DIFFERENT LIFE: Today, Kotula lives a hectic life with her husband and two boys, age 2 and 5, in San Rafael, Calif., where she runs a general dental practice. She is traveling to Peru this May for a family vacation – the first trip there for the children – but this time she will leave the dental tools at home. "It's hard to put myself back in that situation now," she says. "But it really was the most rewarding thing I've ever done."

THEN AND NOW

1881: UC Regents established a dental college with seven professors, nine instructors, and four demonstrators. Eight students enrolled in the Class of 1882.

2015: School of Dentistry has 186 full- and part-time faculty members, 239 volunteer faculty, and 400 staff members. The school admitted 136 new students for the Class of 2018; 48 were international.

SCHOOL OF MEDICINE



ROBERTO CUEVA, MD '83

Hometown: Fullerton, Calif.

Now: La Mesa, Calif.

Position: Neurotologist/skull base surgeon, Kaiser Permanente

Hobbies: American history, wine collecting, gourmet cooking, singing, travel

“It was the first all-school UCSF alumni meeting I’ve attended in San Diego,” says Bob Cueva, who hosted a UCSF on the Road event last August. “I had lots of interesting conversations with alumni from different class years, disciplines, and backgrounds – very positive interactions.”

When Cueva began his education at UCSF in the late 1970s, his heart was set on family practice. But he quickly realized that primary care probably was not the best match for his personality. He then tried a number of different surgical rotations – many more than his classmates, he says – and settled on otolaryngology.

“My father was a general surgeon, and I think he was a little disappointed I didn’t follow in his footsteps, but I am really happy with the way my career developed,” Cuevas says.

Now in his 23rd year at Kaiser Permanente, Cueva specializes in treating disorders of the ear that affect hearing and balance, and

tumors that affect the base of the skull. He has published nearly 40 peer-reviewed papers, he often presents at meetings nationally and internationally, and he has authored book chapters on his specialty area.

Prior to joining Kaiser, Cueva served on the faculty at UC San Diego School of Medicine. He currently is a voluntary clinical professor and co-directs the neurotology/skull-base surgery fellowship at the school. One of Cueva’s graduate mentees recently joined UCSF’s Department of Otolaryngology.

“We train only one fellow a year,” Cueva says. “We’re dealing with an extremely narrow but important area of otolaryngology.”

Cueva met his wife, Kathleen, during his residency at UC San Diego, where she worked as an emergency room nurse. Now retired, Kathleen – like her husband – uses her hands to help people. As a hospital volunteer, she practices Reiki, a powerful Japanese touch-oriented

healing technique that promotes relaxation and reduces pain.

“I continue to support UCSF because my education there was spectacular,” says Cueva. “Mostly I appreciated the diversity of my fellow students – both race and station in life – and the university’s stimulating and

positive environment, which prepared me very well for my subsequent training and career.”

THEN AND NOW

1874: Lucy Maria Field Wanzer was the first woman admitted to what would become the UCSF School of Medicine. She graduated with honors in 1876.

2015: The number of women in the school has increased progressively over the years; the Class of 2018 is 54 percent women.

“The patients come from rural areas, often traveling six to eight hours to the hospitals.”



**DIANE SKLAR,
MD '79**

Hometown: Boston, Mass.

Now: Tiburon, Calif.

Position: Urogynecologist,
Kaiser Permanente

Hobbies: Bicycling, hiking,
tennis, reading, quilting

Diane Sklar (left), Siaya District, Kenya, 2007

When Diane Sklar was a first-year medical student in 1976, a massive earthquake struck Guatemala, killing 23,000 people and injuring nearly 77,000. At the time, she was taking a class at UCSF called “Spanish for Health Care Professionals,” taught by a Guatemalan native. The class quickly morphed into an earthquake relief team.

“I volunteered to go to Guatemala that summer along with other UCSF and Stanford students,” she says. “I spent about six weeks there, and it was a pretty amazing experience. We set up a very primitive type of hospital.”

TRIPS TO FARAWAY PLACES: She followed her medical degree with a residency in ob-gyn at UCSF. Now a urogynecologist at Kaiser Permanente with a 30-year career in her wake, Sklar has completed more than 20 medical missions to far-off destinations, including Guatemala, Nicaragua, Bolivia, and Kenya.

“The patients come from rural areas, often traveling six to eight hours to the hospitals,” she says.

MAKING LIVES HEALTHIER: When she’s on a medical mission, Sklar teams up with local physicians to perform procedures ranging from hysterectomies to fibroid

removals to reconstructive surgery on women ranging in age from 20 to 80. After she leaves, she stays in contact with the local doctors so they can inform her if a problem arises with any of the patients.

“I love my work at Kaiser,” says Sklar. “But there is something so wonderful about providing a medical service to women that is not ordinarily available to them. Unless they are quite wealthy, people in these countries simply don’t have access to most of the surgical care we do.”

NON-MONETARY REWARDS: Sklar also teaches third- and fourth-year medical students at UCSF and

manages a fourth-year clerkship at Kaiser. She would like every student to have the opportunity to work overseas because of the unique perspective it offers.

Sklar, who recently accompanied a team of UCSF doctors to Uganda to teach local medical students, says her trips are usually self-funded. But she acknowledges that the rewards go beyond the financial.

“It feels so good to work in an environment where the only currency exchange is smiles, love, and gratitude,” she says. “Those are the feelings that one returns home with, and they’re priceless.”

SCHOOL OF NURSING

CATHERINE WALSH, MS '02

Hometown: San Francisco, Calif.

Now: Los Angeles, Calif.

Position: Accreditation manager, Ronald Reagan UCLA Medical Center; and co-director, Measuring to Achieve Patient Safety (MAPS)

Hobbies: Hiking, kayaking, art projects with her children



Cait Walsh was surprised to find several UCSF alumni working at the Ronald Reagan UCLA Medical Center when she helped plan a UCSF on the Road event in Los Angeles last summer.

“It was good for me professionally to get involved,” she says. “I hope to stay in touch with many of the nursing alumnae I met and perhaps engage some of them in my projects.”

Walsh, a nurse practitioner who specializes in quality of care and inpatient safety with a focus on geriatrics, is not short on projects. She is known nationally for her work on falls and fall prevention in a

hospital setting, and she recently completed a three-year grant at UCLA that expanded the existing “4Ps” patient safety program to “5Ps.”

Many hospitals employ the “4Ps” hourly check-in procedure to assess patients’ pain, personal needs, positioning in the bed or chair, and placement of items. Walsh and her team added “preventing falls” to the list, which led to a 30-percent decline in inpatient falls at UCLA over a two-year period.

Walsh found her calling once she arrived at the UCSF School of Nursing. She remembers how incredibly passionate her professors were, and that passion

rubbed off. “I knew I’d landed at a class-act school,” she says.

She met her future husband, resident alumnus Michael Yeh, MD, a UCLA surgeon, at Long Hospital when he was a surgery intern. The couple now has two children, Roan, 12, and Patrick, 10. “[Former UCSF School of Nursing Dean] Kathy Dracup was a good friend of Michael’s family. It was funny for Michael to have lunch with my dean. Once, we all went out for dinner, and then it was doctors against nurses,” Walsh recalls. She says she was happy to have Dracup by her side.

Walsh plans to continue her mission of spreading the word on

fall prevention as she reaches out into the community, in particular, to elderly populations, who can be the most at risk.

“If you look at the literature,” she says, “falling down, especially for people age 75 or older, is unfortunately the beginning of the downward spiral to exiting this planet.”

Walsh also would like to explore the exciting possibility of earning a PhD at the School of Nursing. “I’m a very fortunate person in that I love what I do,” she says. “Being a nurse and getting my master’s at UCSF created so much opportunity in my life.”

“The school opened lots of doors for me. I had such wonderful teachers and mentors.”



MIRIAM HIRSCHFELD,
MS '72, DNS '78

Hometown: Vienna, Austria

Now: Tel Aviv, Israel

Position: Retired

Hobbies: Reading, travel

Miriam Hirschfeld laughingly shares that she chose the master's program at UCSF because the course was short, the tuition was low, and she liked the idea of San Francisco. But she loved the School of Nursing more than she could have imagined.

EXTRAORDINARY POSITIONS: After returning to Israel and then coming back to UCSF to complete her doctorate, Hirschfeld accepted an appointment as director of the Generic Nursing Program at Tel Aviv University. That was just the beginning of a string of extraordinary appoint-

ments and accomplishments. In 1989, she accepted a position as chief scientist for nursing with the World Health Organization (WHO) in Geneva, Switzerland. Nine years later, WHO asked her to lead its Human Resources for Health division. Finally, she led the establishment of a department for home-based and long-term care at WHO headquarters.

ADVOCATE FOR MANY:

Throughout her career, Hirschfeld championed improved policies for nursing education and long-term care in Israel and globally.

“Lots of people need care every day of their life, and if they have family looking after them, then the family needs care too,” she says.

TEACHER AND MENTOR:

Humble about her own achievements but quick to praise others

— in particular, her mentors at UCSF — Hirschfeld admits, albeit reluctantly, that former students do now consider her their mentor.

INTERNATIONAL RECOGNITION:

After leaving WHO, she joined the faculty of Yezreel Valley College in Israel to establish an academic nursing program that empowered minority students. In 2012, Austria — from which she immigrated to Israel in 1966 — gave her that country's highest presidential medal for her contributions to developing academic nursing programs in Austrian universities. In addition, she received honorary doctorates for her work from Oregon Health & Science University in Portland and Nottingham University in the UK. Then, in 2014, the University of Pennsylvania awarded her its Soad Hussein Hassan Visiting Global Scholar Award.

“But make sure you look up those people who taught me at UCSF,” she says. “They were special.”

THEN AND NOW

1948: Pearl Ida Castile, recruited by UCSF in 1933, served as instructor and supervisor of surgical nursing at UC Hospital. She was the first faculty member in the school to hold a doctoral degree, which she earned in 1948 from Stanford University.

2015: School of Nursing offers two doctoral programs — a PhD in nursing (began 1984) and a PhD in sociology (began 1968). Today, 94 faculty members possess doctoral degrees.

SCHOOL OF PHARMACY



MARILYN STEBBINS, PHARM.D. '88

Hometown: Sacramento, Calif.

Now: Davis, Calif.

Position: UCSF professor of clinical pharmacy

Hobbies: Running, reading and audiobooks, playing or watching almost any sport

To say that Marilyn Stebbins is absorbed in her pharmacy work barely scratches the surface. At last fall's UCSF on the Road event in Sacramento, she accidentally introduced School of Dentistry Dean John Featherstone as dean of pharmacy. She was swiftly corrected by the 100 or so alumni in the audience.

"It was the perfect icebreaker," Stebbins says, unembarrassed. "At least everyone was paying attention!" Stebbins co-hosted the event, at which alumni from all four UCSF professional schools and the Graduate Division mingled with friends old and new. "I've been to many alumni events, but they're usually just for pharmacists," she adds. "It was great to have a large group of alumni from across UCSF."

INNOVATIVE PHARMACY

SERVICES: Stebbins joined the UCSF faculty in 1998. With an emphasis on elderly and underserved patients, her research has focused on Medicare Part D – the prescription drug benefit enacted in 2006 – as well as cost containment and education. In

2013 she was appointed vice chair of clinical innovation, with the charge of creating novel, interprofessional, team-based pharmacy programs to help patients transition from acute care settings back into their communities.

"We need to be thoughtful about our pharmaceutical services because resources are so limited," Stebbins says. The best way to identify issues is to speak directly with patients, she adds, both in the hospital and after they've gone home. She trains her students to perform much of that outreach, and they, in turn, get to hone their patient-communication skills.

EMPOWERING THE PATIENT:

Stebbins is now involved in several new programs: Meds to Beds, which ensures delivery of discharge medications to patients before they leave the hospital; the MedList Clinic, which provides patients a comprehensive medication review and personalized medication list; and a 48-hour post-discharge follow-up phone call program. Perhaps her most visible collaboration is the Walgreens at UCSF in Millberry Union, a new pharmacy model

that puts the pharmacist right out at the front counter. It offers private pharmacist consultations for every prescription, comprehensive medication reviews, and vaccinations and travel immunizations as well as employment and learning opportunities for students.

The overarching goal, Stebbins says, is to involve patients. "For our patients, knowledge is power,"

she says. "Anything we can do to engage them in their own care will empower them to take charge of their own well-being."

THEN AND NOW

1944–1967: School of Pharmacy Dean Troy C. Daniels, PhD, instituted the practice of recruiting PhD faculty members into the school, which was not standard for pharmacy schools of the day.

2015: School of Pharmacy receives more research funding from the National Institutes of Health than any other pharmacy school in the nation, as it has done every year for more than 30 years.

“As long as I can continue to learn and make an impact for patients, I’m willing to go anywhere.”



**MICHAEL LIM,
PHARMD '99, MBA**

Hometown: Los Angeles, Calif.

Now: London, United Kingdom

Position: Corporate strategy director, GlaxoSmithKline

Hobbies: Cooking, music, learning Mandarin Chinese and French

“Working overseas had always been a personal ambition of mine,” says Mike Lim, a clinical pharmacist and recent Cambridge University Executive MBA graduate. “But I never really thought a UCSF education would be a stepping-stone in that direction.”

DELVING INTO HIV/AIDS: After graduating from UCSF School of Pharmacy, Lim completed an HIV specialty residency at San Francisco General Hospital. GlaxoSmithKline piqued his interest because of its legacy as developer of AZT, the first breakthrough drug in AIDS therapy. He went on to earn a fellowship focused on HIV clinical pharmacology

at the University of North Carolina in collaboration with GlaxoSmithKline, and in 2003, he joined the company as a drug development scientist. Following the termination of a high-profile HIV candidate drug, Lim was offered the opportunity to relocate to London to help start a new team – the perfect opportunity to realize his desire to work abroad.

MANAGEABLY DIFFERENT: Lim describes his initial encounters with the British culture as manageably different. “It’s only after you’ve been in the country a while that you realize the less obvious nuances in the language and in the way people relate to

each other,” he says. His work colleagues apparently did not hold back at first in pointing out the differences in word usage. “For example, I would say, ‘I like your pants,’” Lim says. “People would burst out laughing, because in the United Kingdom, pants means underwear.”

GRADUATION SPEECH: Last year, Lim gave the graduation speech for UCSF’s School of Pharmacy Class of 2014, at which Dean Joseph Guglielmo, PharmD, a resident alumnus, read out loud Lim’s 1994 letter of application. Lim expected to be embarrassed, but he was pleasantly surprised to realize that what he wrote 20 years ago – his keen interest in science and his passion to bridge

the gap between science and patients – still resonates for him.

THE TRAVEL BUG: Following leadership roles in oncology, immuno-inflammation, and respiratory health, Lim is now immersed in the challenges of understanding how a large global operation functions and in developing strategies for innovative business models and advanced technologies. As for his next step, perhaps he has caught the travel bug.

“There’s the possibility of a future assignment in another country for GlaxoSmithKline,” Lim says. “As long as I can continue to learn and make an impact for patients, I’m willing to go anywhere.”

GRADUATE DIVISION

GRACE HUYNH, PHD '07, MD

UCSF Graduate Program:

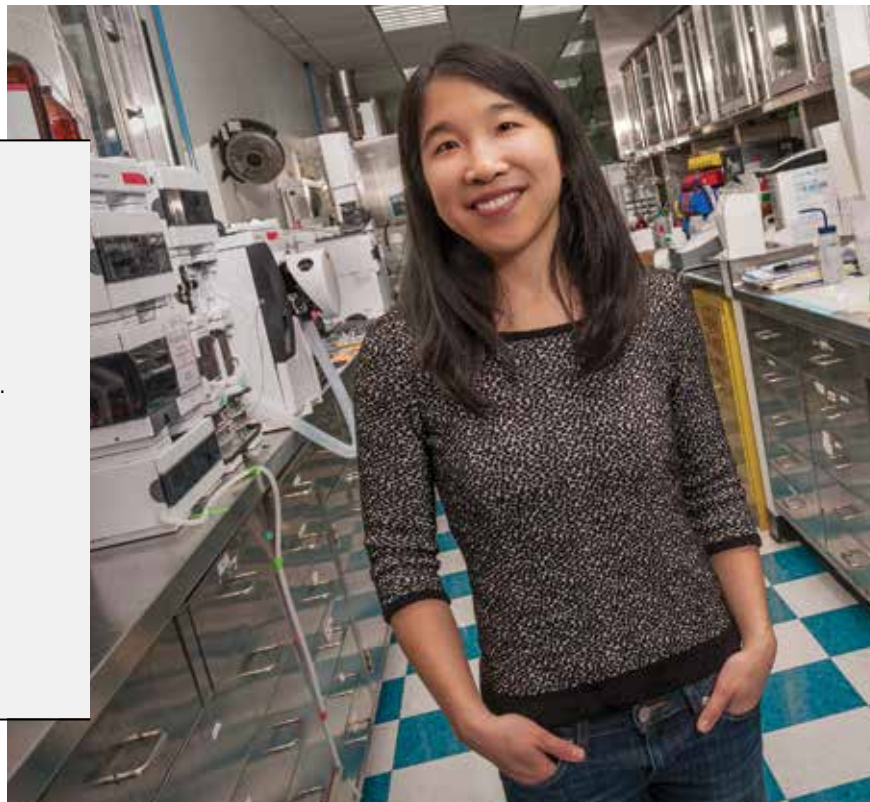
Bioengineering

Hometown: Mercer Island, Wash.

Now: Bellevue, Wash.

Position: Senior research scientist, Institute for Disease Modeling

Hobbies: Triathlons, hiking, singing, driving her convertible with the top down



She started on her bachelor's degree in bioengineering at the tender age of 13. Now, armed with a PhD from the UCSF-UC Berkeley Joint Program in Bioengineering and an MD from Stanford, Grace Huynh brings a rich, multidisciplinary approach to her work in infectious disease.

"Challenges in biology and medicine are becoming more and more interdisciplinary," Huynh says. "New developments in fields like systems biology, neuroscience, and genome sequencing require broad scientific knowledge. I think this is where having a bioengineering background comes in handy."

Huynh was one of the hosts of the August 2014 UCSF

on the Road alumni event in Seattle, featuring a visit from School of Pharmacy Dean Joseph Guglielmo, PharmD, a resident alumnus. "It's always fun meeting alumni from across UCSF," she says. "They are truly an exceptional bunch."

A POWERHOUSE OF LEARNING:

Huynh came to the UCSF-UCB bioengineering program to draw on the strengths of two great learning institutions. At UCSF, she focused on drug delivery and worked in the lab of Professor Francis Szoka, PhD, investigating novel methods of targeting drugs directly to brain tumors.

Although her first love was research, it was a passion for helping others that drove her to

pursue an MD. "It's important to understand the patient experience," Huynh says. "That little bit of clinical experience gives me a better perspective on how new technologies and treatments can be useful for real people."

FIGHTING INFECTIOUS DISEASE:

Huynh is now doing infectious disease modeling for tuberculosis (TB) and malaria. She has been collaborating with the Chinese Center for Disease Control to model the TB control strategy in China, which has the second highest burden of TB cases in the world.

Using data collected from China's TB program, Huynh crunched numbers on testing, patient compliance, treatment

quality, and other variables to estimate how the introduction of new drugs and diagnostics could reduce TB incidence and mortality. A software program based on that work, along with training and technical support, is now available for free, to anyone, anywhere in the world. Huynh hopes it will be especially useful for improving disease control in countries like India and South Africa, where the burden of TB is also high.

Huynh says she finds it exciting to collaborate with experts across biology and medicine. One recent highlight in her budding career was meeting Peter Agre, MD, winner of the 2003 Nobel Prize in Chemistry. "We got to hang out and chat about tuberculosis, which was really cool."

“I learned how to apply science in the real world to discover and develop drugs.”



STEVE YANG, PHD '97

UCSF Graduate Program:

Pharmaceutical Chemistry

Hometown: Wuhan, China

Now: Shanghai, China

Position: Executive vice president and chief operating officer, WuXi AppTec

Hobbies: Running and reading

When Steve Yang moved from China to the United States in 1989 as a college transfer student, what stood out for him above all else was the weather. His parents, both university professors, believed the United States would provide Yang with the best education, and they chose Michigan Technological University for their son out of

a short list of reputable and affordable colleges.

“But it wasn’t just Michigan,” Yang says, smiling. “It was the Upper Peninsula of Michigan. Its record is 350 inches of snow in a year.”

Fortunately, the snow and cold didn’t stop Yang from earning a BS in biology summa cum laude,

after which he joined the UCSF Graduate Division as a PhD student. “From a small Midwest college, I went to a great city and an even greater school,” he says, proudly. After he found his way to the lab of Charles Craik, PhD, and began studying proteases – enzymes involved in virtually every biological function or dysfunction, including cancer – and protease inhibitors.

“I received excellent training in basic science at UCSF,” says Yang. “I also learned how to apply science in the real world to discover and develop drugs.”

Yang has worked the gamut of biotech and pharmaceutical companies, from a startup in Mountain View, Calif., to multinational corporations Pfizer and AstraZeneca. His responsibilities included building research and development (R&D) capabilities and partnerships throughout Asia and emerging markets and managing drug discovery and translational science

efforts in China. Last year, he accepted a senior role at WuXi AppTec, a 9,000-employee global pharmaceutical and medical device R&D company with major presences in China and the United States.

Yang perceives himself in this new position as a bridge – like the Golden Gate Bridge, he says – between the two nations. He recently visited San Francisco for the JP Morgan Healthcare Conference, at which he and his colleagues met with customers, partners, and venture capitalists in the biotech and pharmaceutical industries. He also reunited with Craik at an alumni gathering.

Now living in Shanghai with his wife and two children, Yang travels to the United States regularly for business and to see family. “My older daughter was born in Sunnyvale, so she has strong connections to California,” he says. Although his job has taken him many places across Asia, Europe, Latin America, and the Middle East, Yang considers the Bay Area his second home.

THEN AND NOW

1985: The Graduate Division, which began in 1961 with fewer than 300 students, had by 1985 grown to 894 students and 700 postdoctoral scholars in 36 departments.

2015: The Graduate Division enrolls approximately 1,625 students in 26 degree programs and around 1,100 postdoctoral scholars working in departments and labs across campus.



***Stentor*, 2014**

It's not an acorn or hazelnut, nor is it an insect or seashell. It's a *Stentor coeruleus* – a single-celled protozoan covered with hair-like cilia – and it's preparing to divide. Anna Reade, a UCSF graduate student in biological sciences, captured the moment using fluorescence light sheet microscopy, a new technique that allows living

organisms labeled with fluorescent molecules to be imaged over long periods of time, at high resolution, and with minimal photo damage. The image took the top prize in a contest sponsored by pArt of Science, a website that celebrates high-quality scientific photos, and hosted at UCSF's Smith Cardiovascular Research Building.

PHOTO: ANNA READE

A photograph of a man with dark hair, wearing a white lab coat over a blue shirt and tie, working in a laboratory. He is holding a small electronic device with wires attached to it. The background shows laboratory shelves with various equipment and supplies.

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Developed by postdoc Mozziyar Etemadi, PhD '13, and a team of surgical residents, engineering students, and developers led by pediatric surgeon Hanmin Lee, MD, and biomedical engineer Shuvo Roy, PhD, SmartDerm evolved from exactly the kind of collaboration that thrives at UCSF. It's one of the first projects to emerge from UCSF's new Surgical Innovations initiative, which fosters the cross-disciplinary teamwork and rapid testing and perfecting required to quickly bring device ideas from concept to reality.

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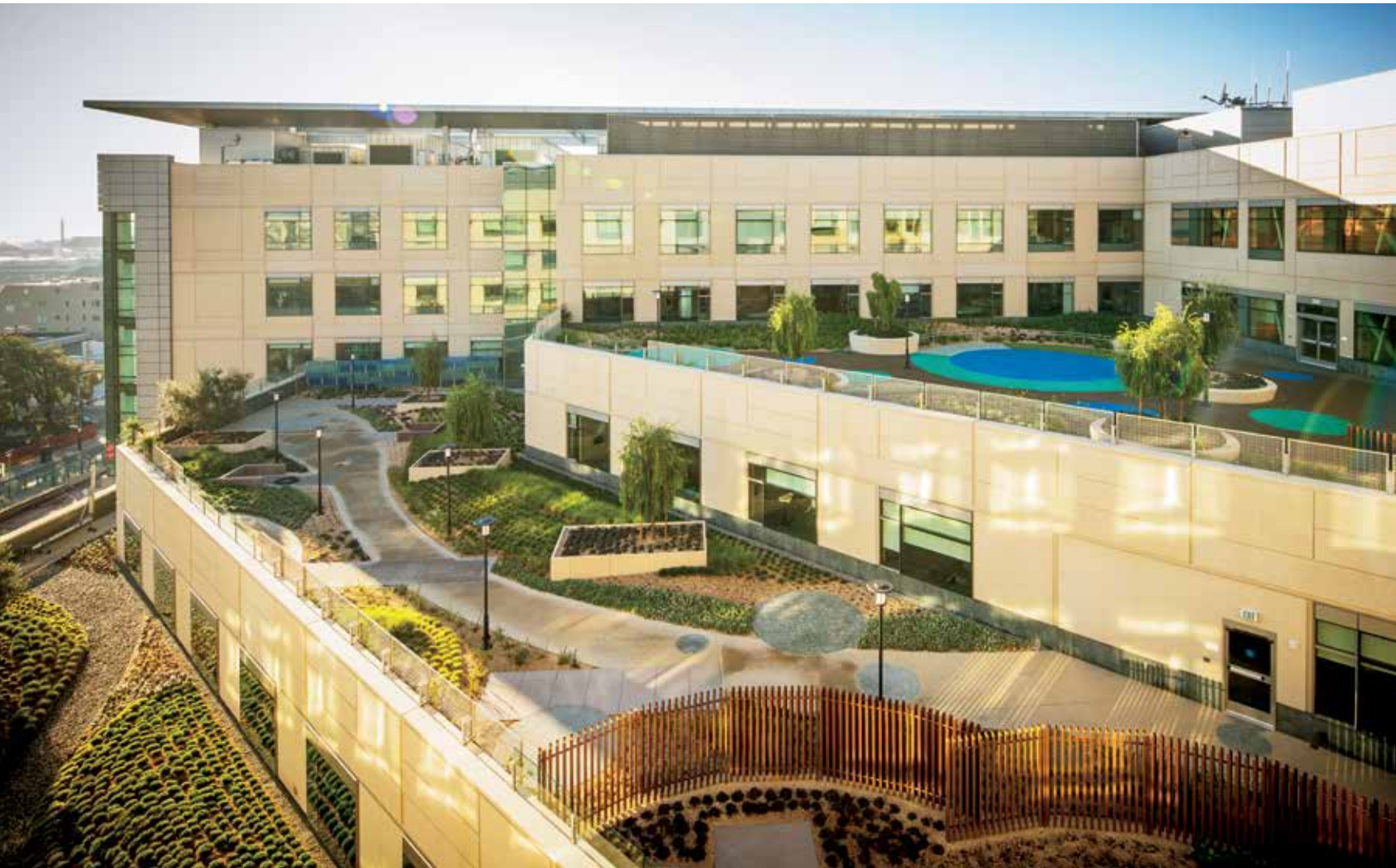
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NATURE IN THE CITY: UCSF Medical Center at Mission Bay is among the greenest urban hospitals in the country. Read about opening day on page 12.

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