

UCSF

MAGAZINE

Spring 2014



ONLYUCSF150

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MINING OUR MICROBIOME • SILVER CITIZEN CARE • MENTOR-PROTÉGÉ POWER



UCSF MAGAZINE SPRING 2014

This detail from a mural depicting the history of medicine in California was painted by Bernard Zakheim in UCSF's Toland Hall in the 1930s.



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Why the best drug factory just might be the bacterial communities thriving in the human body.

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Offering protégés inspiration and wisdom along the path to professional mastery.

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Passing the Torch

Two respected physician-scientist leaders sat down with KQED Public Radio's Scott Shafer in March to share their views at a pivotal moment: the changing of the guard at UC San Francisco.

Renowned pediatrician Sam Hawgood, MBBS, took the helm of UCSF in April, when he became interim chancellor. The dean of the School of Medicine and vice chancellor for medical affairs, Hawgood has enjoyed a distinguished 32-year career at the University. The School of Medicine has thrived under his leadership – it is now the top medical school in the nation in National Institutes of Health research funding, and many of its departments also lead the nation in their fields. He assumed the chancellor's role from Susan Desmond-Hellmann, MD, MPH, who joined the Bill & Melinda Gates Foundation as CEO on May 1. Among her many accomplishments at UCSF were launching the precision medicine initiative and navigating the University through the 2008 economic downturn. Following are some excerpts from their conversation about leadership.



ON GOOD LEADERSHIP

Desmond-Hellmann: The most important measure of good leaders is that people want to follow them. Clarity of purpose is essential. Great leadership has a clear direction and lets everyone know they can be part of following that clear direction.

Hawgood: To amplify on that, it's not about the leader but the leader's ability to bring out the best in others. It's aspirational. It's interesting: neither of us reflected on the personal attributes of leaders, because they can come in many different flavors – like great ice cream.

ON LEADING DURING TOUGH TIMES

Hawgood: To lead is not a job – it's a verb. It's what you do to get people to follow you. The dynamic is interesting. Leaders are [expected to have] an enormous strength of will to get things done, but also to be flexible when challenges arise or a change of direction is needed. Getting that balance right is critical.

ON THE BALANCING ACT

Desmond-Hellmann: It's moving from a wish to be liked to a wish to be respected. What I care about most is that people see me as fair. [It's also important to be] clear about how you are making decisions and what your values are. Early in my career, I thought there was a certain way leaders had

to be: male and strong and aggressive, like [former General Electric CEO] Jack Welch. I thought, “I’m no Jack Welch!” [Then] I got to work for Art Levinson at Genentech. His major attribute as a leader for me was authenticity – what you saw is what you got.

ON NAVIGATING COMPLEXITY

Hawgood: I like the term “adaptive leadership” – not every occasion is going to cull from you the same style and approach, but you must remain crystal clear on the purpose and goals of the issue. And when you are at loggerheads, it’s really important to try and understand why. In medicine, we diagnose before we treat, and yet in leadership, I don’t think we spend enough time diagnosing.

BEST ADVICE RECEIVED

Desmond-Hellmann: Don’t underestimate what’s possible. Change the world and go big. I’ve heard it in many versions, but it always pushes me to ask “Are we striving for a journey that’s ambitious enough?”

ON WHAT HELPS MOTIVATE UCSF FACULTY AND STAFF

Hawgood: The implicit reward of working for a noble purpose. Our product is a changed human being. Private universities have that same nobility of purpose, but our nobility of purpose coupled with our public mission creates a very powerful reward system.

ON UCSF PRIDE

Desmond-Hellmann: I see enormous pride across UCSF – in breakthroughs and

helping solve the suffering of patients and families, in our students and trainees, and in what UCSF does in our community, both in our schools and as an economic driver. We’re making a mission-driven difference in areas that advance health worldwide, but we’re also making a community difference.

ON UCSF’S ROLE IN A CHANGING HEALTH CARE ENVIRONMENT

Hawgood: As a health science-only university, UCSF sits at the exact vortex of two major industries that are up for disruptive innovation – health care and higher education. I’m excited about that opportunity, because with our intensity of focus, we have the ability to create a new model for both of those industries going forward.

ON UCSF’S HOME TURF, THE BAY AREA

Hawgood: It’s a huge advantage. It’s enabled us over decades to have – deep in our DNA, our culture – a willingness to change, take risks, and be entrepreneurial. It’s one of the reasons we have an opportunity to come up with the new models that are going to be important. It’s not just the innovation of Silicon Valley; it’s the people who are attracted to the Bay Area. They tend to want to push things along. And our students are as smart as tacks and [drive] our momentum. They’re not going to let us slow down.

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FOR ALUMNI AND FRIENDS

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CRACKING AUTISM



A research team led by UC San Francisco scientists has revealed that a neuronal disruption that can occur 10 to 24 weeks after conception may be a significant factor in the emergence of autism.

Though autism has been linked to mutations in as many as 1,000 genes, the team, led by graduate student Jeremy Willsey, focused only on the nine genes most strongly associated with the disorder. The researchers showed that during the middle period of fetal development, this set of genes contributes to abnormalities in brain cells known as cortical projection neurons, which are located in the deepest layers of the developing prefrontal cortex.

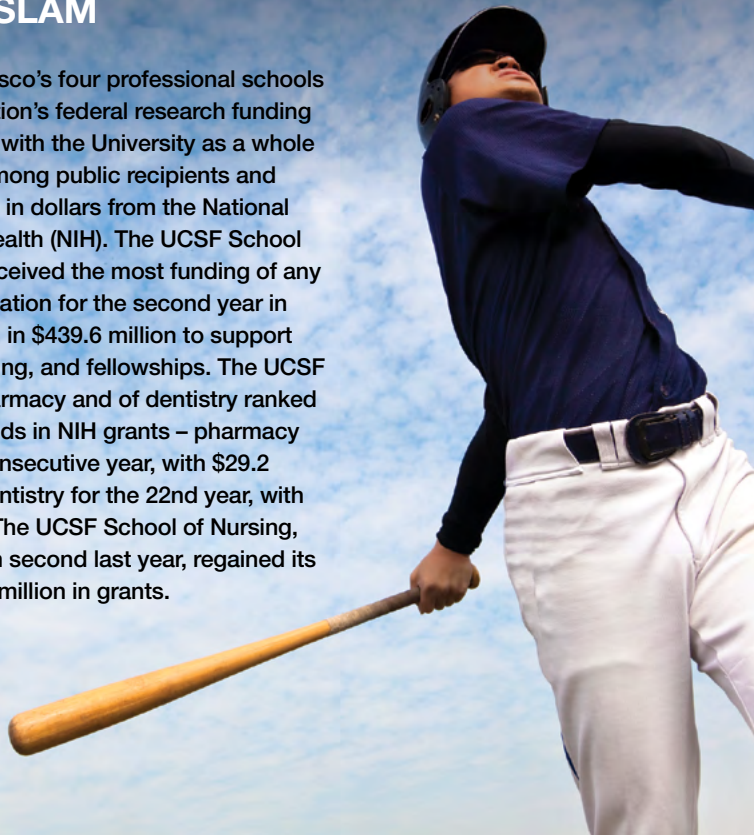
The finding was made possible by leaps in

genetic sequencing and brain-mapping technology. “We couldn’t have done this research even two years ago,” says Chair of Psychiatry Matthew State, MD, PhD, the study’s senior investigator and UCSF’s Oberndorf Family Distinguished Professor. “We didn’t have the key ingredients: a set of unbiased autism genes that we have confidence in and a map of the landscape of the developing human brain.”

State is referring to the team’s use of BrainSpan, a digital brain atlas that documents how and where genes are expressed over time in the human brain. This discovery illustrates how large-scale precision medicine data sets create a deeper understanding of the complex relationship between genetics and biology.

NIH RESEARCH FUNDING GRAND SLAM

UC San Francisco’s four professional schools topped the nation’s federal research funding roster in 2013, with the University as a whole ranking first among public recipients and second overall in dollars from the National Institutes of Health (NIH). The UCSF School of Medicine received the most funding of any school in the nation for the second year in a row, bringing in \$439.6 million to support research, training, and fellowships. The UCSF schools of pharmacy and of dentistry ranked first in their fields in NIH grants – pharmacy for the 34th consecutive year, with \$29.2 million, and dentistry for the 22nd year, with \$13.7 million. The UCSF School of Nursing, after coming in second last year, regained its lead with \$9.6 million in grants.

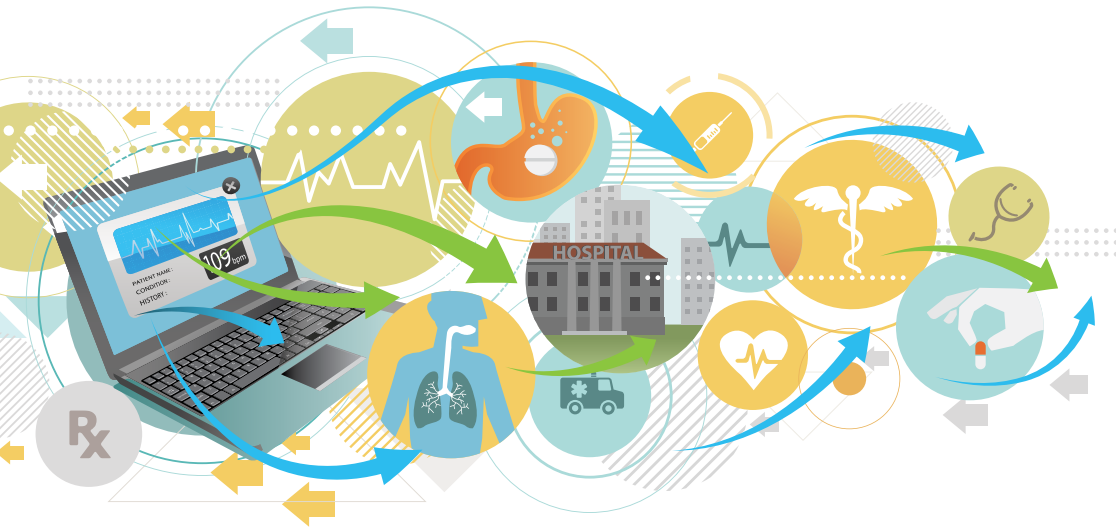


“We suspect they are running out of money to eat.”

Public health researcher and resident alumna Hilary Seligman, MD, on her study showing that an inability to afford food might contribute to a diabetics’ risk of being hospitalized, quoted in *Forbes*



TRAINING FOR THE 21ST CENTURY



A new medical subspecialty will teach doctors how to master a deluge of data.

UC San Francisco has launched two new programs designed to educate health science leaders in an era marked by sweeping shifts in both technology and policy. The first program is board certification in clinical bioinformatics, and the second is a master of science program

in healthcare administration and interprofessional leadership (MS-HAIL).

Physicians delving into the world of precision medicine need to harness the power of massive quantities of patient information. Clinical bioinformatics, the nation's first new

board-certified medical subspecialty in 20 years, involves educating doctors on how to collect, synthesize, and present data to deliver patient care more safely and effectively. Seth Bokser, MD, a resident alumnus and the medical director for information technology at UCSF Benioff Children's Hospital San Francisco, is in the inaugural group of physicians slated to receive board certification in the subspecialty.

Housed in the School of Nursing, the MS-HAIL program brings together students from a range of disciplines – medicine, nursing, dentistry, pharmacy, social work, and other professions – and trains them as leaders to shape health care systems of the future. It was also the first graduate program in the UC system to be taught mostly online. Since students don't have to quit their jobs, "they can apply new knowledge to help their organizations meet the 'triple aims' driving health care today: the pursuit of better care for individuals, better health for populations, and lower per capita costs," says program director Mary Louise Fleming, RN, PhD '07.

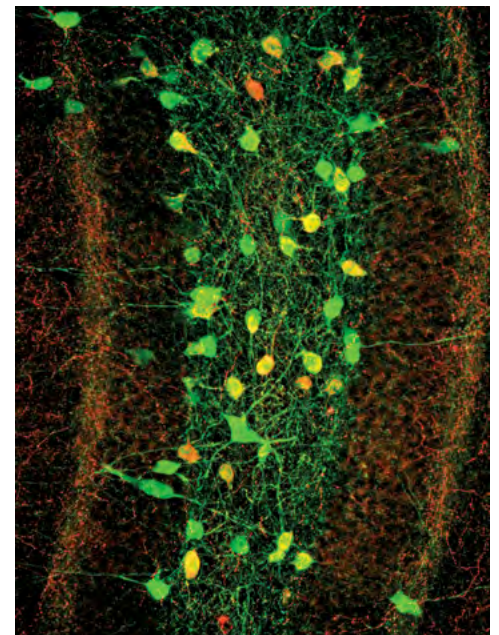
CELL THERAPY FOR SEIZURES

UC San Francisco researchers have figured out how to control intractable epileptic seizures in mice with a one-time transplantation of neural progenitors – cells capable of generating neurons. The cell therapy, long tried by others in the field to no avail, offers new hope for patients with seizures not responsive to medication.

The research team, led by Scott Baraban, PhD, transplanted progenitors from a part of the embryonic rodent brain called the medial ganglionic eminence into the rodents' hippocampus, a brain region responsible for learning and memory. These progenitors became inhibitory nerve cells that restrained signaling in overactive circuits. The new cells squelched the synchronous, nerve-signaling firestorms that spawn seizures, entirely eliminating seizures in half of the treated mice and dramatically reducing them in the rest.

Cell therapy is an active focus of epilepsy research, in part because even if current medications are effective, they control only symptoms and not the underlying causes of the disease, explains Baraban, who holds UCSF's William K. Bowes Jr. Endowed Chair in Neuroscience Research. In many types of epilepsy, Baraban adds, current drugs are entirely ineffective.

"Our results are an encouraging step toward using inhibitory neurons for cell transplantation in adults with severe forms of epilepsy," says Baraban. "This procedure offers the possibility of controlling seizures and rescuing cognitive deficits in these patients."



THROUGH THE GOOGLE GLASS



Wearable computer technology like Google Glass could lead to better decision-making in the operating room.

Cardiothoracic surgeon Pierre Theodore, MD (above), goes into the operating room with one main goal: getting his patients in and out of surgery safely and efficiently. Google Glass, a 1.8-ounce computer configured like a pair of eyeglasses, is taking him a giant step closer to that goal by transforming the way he performs surgery.

Theodore preloads CT and X-ray images needed for a procedure and then once he's in the OR he calls them up on his Google Glass so he can compare the scans with the actual surgical site. "Often one will remove a tumor that may be deeply hidden inside an organ – the liver, the lung – for example," says Theodore, who is an associate professor of clinical surgery and holds UCSF's Van Auken Endowed Chair in Thoracic Oncology. "To be able to have those X-rays directly in your field without having to leave the operating room or to log on to another system elsewhere – or to turn yourself away from the patient, diverting your attention – is very helpful in terms of maintaining your attention where it should be, which is on

the patient 100 percent of the time."

Theodore is the first surgeon to receive clearance from an Institutional Review Board (IRB) to use the high-tech device as an auxiliary surgical tool in the operating room; IRBs are independent ethical review bodies designated to approve, monitor, and review biomedical research involving human subjects. Theodore was introduced to the idea by Nate Gross, MD, the co-founder and medical director of Rock Health, a San Francisco-based seed fund that supports digital-health startups.

While wearing the Google Glass device, users see data on a "screen" that appears in their peripheral vision, Gross explains. "If my vision is a tic-tac-toe board, it would take one

of those upper corners," he says. "It feels like looking in the rearview mirror of your car. That rear view is always there when I need it, but it's not there when I don't."

UCSF and health care providers across the United States are increasingly introducing new technology to transform health.

"I truly do think that the general concept of wearable computing technology in health care is revolutionary." – *Pierre Theodore*

UCSF launched the Center for Digital Health Innovation last year, in part to validate the functionality and accuracy of new digital health devices, diagnostic tools, mobile health applications, and sensor-based technologies and to assess whether they bring value to and improve outcomes for patients in the ever-evolving health care delivery system.

The key benefit from wearable technology like Google Glass, according to Theodore, is to make information more accessible to physicians, who regularly must make critical decisions. "Poor decision-making is a chief source of poor outcomes among patients," he says. "So I think that's one way the Google Glass can truly help, by providing data when we need the data."

Theodore also believes that American surgeons could teach modern surgical techniques to physicians in remote areas via Google Glass. Surgeons could live stream surgeries back and forth internationally, providing real-time guidance on the latest techniques and improving health care worldwide.

"I truly do think that the general concept of wearable computing technology in health care is revolutionary," Theodore says.

Watch Pierre Theodore discuss Google Glass: bit.ly/ucsf-gg

ALUMNI RECALL FAVORITE HANGOUTS

Tom Tayeri, MD '90

"We blew off steam at Yancy's Saloon on Irving. It had couches and a dartboard, and we all just camped out there. The song most likely to be playing any time we got together during those days would have probably been Steve Winwood's 'Bring Me a Higher Love.'"



Helen Lomas, BS '53

"We spent Sunday afternoons in Golden Gate Park, because admission to the de Young Museum was free and there were also free concerts. For dessert we would go to Herbert's Sherbet, and for wine we would walk to Judah Street. The bartenders knew we were nursing students and looked out for us. The music of the day was all Sinatra. Some weekends we'd put on shows – singing and dancing – for the patients at the VA."



Wilma Wong, PharmD '73

"We all liked to hang out at the Wishing Well, a little bar on Irving. We went there for the proximity, certainly not the atmosphere! When we were hungry, we ate at Pasquale's or Villa Roma. The song I associate with my UCSF days is 'I Heard it Through the Grapevine' by Marvin Gaye."



HANGOUTS PHOTOS FROM LEFT: STEVE KOCINO, YVONNE THOMPSON, DOLANH

CHILL, MOM

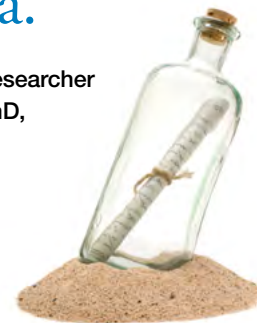
Infants are exquisitely attuned to their own mother's internal physiological responses, a recent UC San Francisco study has revealed. The research showed that mothers who received negative feedback after delivering a speech and experienced negative emotions then exhibited physiological signs of cardiac stress and passed their affective state on to their infants. "Our work shows that, as soon as your baby is in your arms, she is picking up on the bodily responses accompanying your emotional state – and immediately begins to feel, in her own body, your own negative emotion," says lead investigator Sara Waters, PhD, a postdoctoral scholar in psychiatry. "These are our earliest lessons about how to manage stress and strong emotions." Thus a mother who can remain relaxed in the face of stress may be teaching her baby to do the same in the years to come.



PHOTOS: FROM LEFT: RICHYRICHIMAGES, TURNER890

"Right now, electronic cigarettes are the triumph of wishful thinking over data."

Tobacco-control researcher Stanton Glantz, PhD, quoted in *Nature*



YOU ARE WHAT YOU EAT

UC San Francisco nutrition expert Katie Ferraro, MPH, RD, has some reassuring news: If you dive into that meal of fried calamari, juicy steak, and tiramisu – even if you eat like that for a few days – it’s not the end of the world.

“Your overall nutrition status is determined by the days, weeks, months, and years of food and beverage choices you do or don’t make. If you fall off the wagon, extra exercise can combat those additional calories and get you back on track.”

A registered dietitian and assistant clinical professor of family health care nursing in UCSF’s School of Nursing, Ferraro thinks Americans overuse the word “diet.”

“Diet simply refers to all of the foods that you eat. I try to avoid the term ‘going on a diet.’ It implies that you’ll go *off* the diet!”

MOOC SPREADS THE WORD

Last year, Ferraro launched what has turned out to be a startlingly popular UCSF massive open online course, or MOOC, called Nutrition for Health Promotion and Disease Prevention. The six-week course, offered through Coursera, was designed for physicians, registered nurses, and registered dietitians, but it is open to anyone. The first session ended up “graduating” more than 8,000 students from more than 100 countries.

The course, like all of Ferraro’s teaching and education outreach, relies exclusively on documented evidence, “not on what your grandmother tells you,” she says. The evidence-based approach often busts nutrition myths and misunderstandings that many health care practitioners unknowingly keep alive. She’s particularly concerned that the vast majority of doctors never take a dedicated nutrition class.

“You have two-thirds of the country overweight or obese, but many physicians will rightly admit they don’t have the nutrition education they need to adequately advise their

patients on diets for maintaining health or controlling disease.”

DIETS AND DISEASE

People with diabetes, for example, often mistakenly think they can’t eat fruit because it contains sugar. “But fruit is and should be a very important part of a diet for diabetes. Yes, it contains naturally occurring sugar,” Ferraro admits, but also “many other beneficial nutrients that promote overall health.”

Similarly, many people with celiac disease think that a gluten-free diet means avoiding all grains. In fact, many whole grains – such as corn, rice, and quinoa – are fine.

“If you are newly diagnosed with celiac disease, you can easily become overwhelmed with what you *can’t* eat. But research shows that people are far more likely to maintain their health if they focus on what they *can* eat.”

When it comes to cancer, disillusionment with traditional medicine encourages some people to turn to unproven alternatives, including costly and ineffective dietary supplements. “Part of what a practitioner needs to do is to stress what is myth and what is not,” Ferraro says.

“Many Americans are surprised to learn about the overall lack of regulation in the supplement market. In other parts of the world, supplements are more closely regulated.”

She attributes the course’s popularity to the inescapable fact that “most people love to talk about themselves and what they eat. Despite differences in cuisine, palates, and perceptions, food is a great equalizer and can be a universal vehicle for health,” she says.

TOP TIPS FOR STAYING HEALTHY

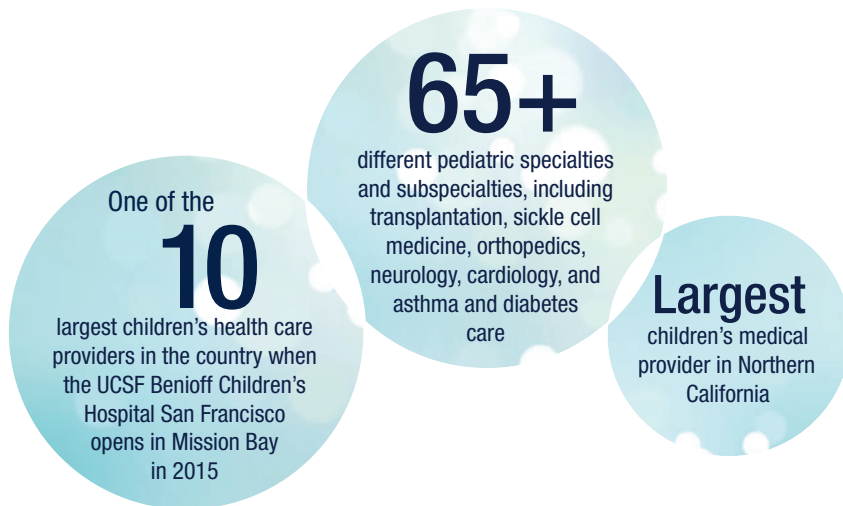
We’ve all heard the basics of a healthy diet, but some of the precepts are easy to forget. Here are a few at the top of Katie Ferraro’s list:

- Try to eat something every three to four hours to avoid becoming overly hungry.
- Make fruit your go-to snack; aim for three pieces of fresh fruit per day.
- Eat your fruit, don’t drink it!
- Include fat, protein, and fiber at each meal to stay full.
- Don’t forget great plant-based protein sources, such as lentils, soy, nuts, and seeds.
- If it’s white, walk away! Minimize refined starches and white breads (as well as high-fat condiments).



PHOTOS: FROM LEFT: PICTUREPARTNERS; OKFEA





AFFILIATION ADVANCES CHILDREN'S HEALTH

Good news abounds for young patients on both sides of the San Francisco Bay: UCSF Benioff Children's Hospital and Children's Hospital & Research Center Oakland affiliated in January. The affiliation has the potential to provide better health care value to consumers through higher quality care, lower costs, and more coordinated access to services at hospital locations in San Francisco and across the Bay, as well as at medical facilities throughout Northern California. Among the top priorities of the partnership are strengthening the existing talent and programs in basic and clinical research and patient care at the two premier institutions, as well as attracting new expertise to accelerate new solutions for children's health.

In recognition of the affiliation, Children's Hospital Oakland is now named UCSF Benioff Children's Hospital Oakland, and UCSF Benioff Children's Hospital is named UCSF Benioff Children's Hospital San Francisco. Together, the hospitals are now known as UCSF Benioff Children's Hospitals.

See related philanthropy story on page 36.

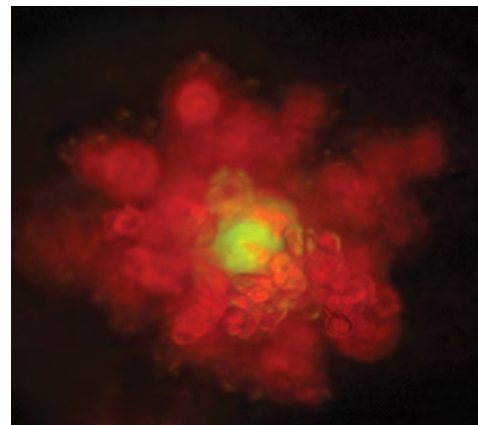
“It’s a very slippery slope ... [from] checking your email, to lying awake with anxiety.”

Sleep medicine specialist David Claman, MD, resident alumnus, who has noticed an uptick in insomnia cases related to smartphones in the bedroom, quoted in “Bits,” the *New York Times* technology blog



PHOTOS: FROM LEFT: PAREMA, ZEV GARTNER

BREAST MODELING



Zev Gartner, PhD, is building a fully functional, 3-D human mammary gland.

His rapid and precise method, considered among the most complex devised to date, has won him a National Institutes of Health Director's New Innovator Award and an accompanying \$1.5 million in research funding.

“With a detailed in vitro model of the human mammary gland, we can poke and prod in any way that we want – at the level of individual cells, groups of cells, whole regions of the tissue, or even the entire gland – to understand how the tissue works,” says Gartner, an assistant professor of pharmaceutical chemistry at UC San Francisco. “This way, we don’t have to study our questions in mice or do experiments in human beings.”

His models, made of cultured cells harvested from breast reduction surgeries, will provide insight into how normal human tissues assemble themselves during development and, conversely, how they break down in diseases such as breast cancer. Gartner's work holds great promise for the testing of novel therapies as well.

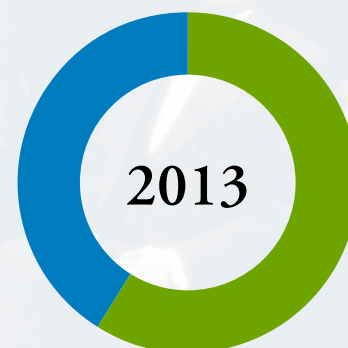
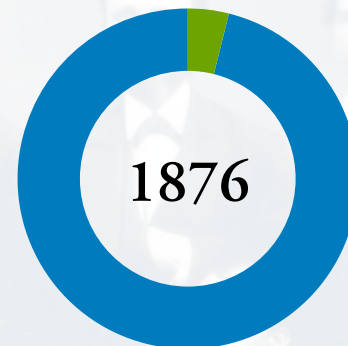
This marks the fourth year in a row that a young UCSF faculty member has won this highly selective funding, designed “to support exceptionally creative new investigators who propose highly innovative research projects that have the potential for unusually high impact.”

STUDENTS BY THE NUMBERS 2013-14

- 3,065 Individuals enrolled across all schools and programs as of fall 2013
- 10,577 Miles from Springs, South Africa, hometown of the student born farthest from UCSF
- 6 Age (strictly speaking) of our five youngest students, who will celebrate their next birthday on February 29, 2016
- 13 Pairs of students who were born in the same city on the same day, month, and year and yet who have different last names
- 42.7 Percentage born in California
- 6.1 Percentage born in San Francisco
- 1.1 Percentage from Boston, the US city with the largest contribution of students outside California
- 4 Percentage from China, the country with the largest contribution of students outside the United States
- 96 Countries of origin on six continents – still waiting for Antarctica!

96 Countries of Origin: Afghanistan | Argentina | Armenia | Australia | Austria | Bangladesh | Belarus | Belgium | Bolivia | Bosnia and Herzegovina | Brazil | Bulgaria | Cameroon | Canada | Chile | China | Colombia | Côte d'Ivoire | Cuba | Ecuador | Egypt | El Salvador | Eritrea | Ethiopia | Fiji | Finland | France | German Democratic Republic | Germany | Ghana | Grenada | Guadeloupe | Guatemala | Haiti | Hong Kong | Hungary | India | Indonesia | Iran | Iraq | Ireland | Israel | Italy | Japan | Jordan | Kazakhstan | Kenya | Korea, Democratic People's Republic of (North) | Korea, Republic of (South) | Kyrgyzstan | Lebanon | Libya | Malaysia | Mali | Mexico | Moldova | Myanmar | Nepal | Netherlands | New Zealand | Nicaragua | Nigeria | Oman | Pakistan | Peru | Philippines | Poland | Romania | Russia | Rwanda | Saudi Arabia | Serbia | Singapore | Slovenia | South Africa | Spain | Sri Lanka | Saint Kitts and Nevis | Sudan | Sweden | Switzerland | Taiwan | Thailand | Trinidad and Tobago | Turkey | Uganda | Ukraine | United Arab Emirates | United Kingdom | United States | Uruguay | Uzbekistan | Venezuela | Vietnam | Zambia | Zimbabwe

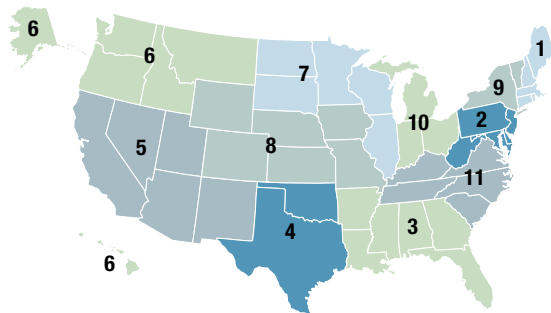
THEN AND NOW



% male students

% female students

PHOTO OF UCSF MEDICAL SCHOOL CLASS OF 1876: UCSF ARCHIVES & SPECIAL COLLECTIONS



“The ultimate goal [is] that your chance of dying [for want of] a liver transplant doesn't depend on your ZIP code.”

Transplant chief John Roberts, MD, quoted in **USA Today** regarding a proposal to redraw the borders of the nation's 11 transplant regions, to even out the availability of and demand for donated organs

MAP: APPELZIR

FACULTY ACCOLADES

Three UCSF faculty members were among the 70 individuals elected in 2013 to the Institute of Medicine; IOM membership is considered one of the highest honors in the fields of health and medicine. The new members are **Jeffrey Bluestone**, PhD, executive vice chancellor and provost and the A.W. and Mary Margaret Clausen Distinguished Professor in Metabolism and Endocrinology; **Molly Cooke**, MD, resident alumna, professor of clinical medicine, and director of education for Global Health Sciences; and **Matthew State**, MD, PhD, chair of the Department of Psychiatry and the Oberndorf Family Distinguished Professor.

The School of Nursing's **Susan Chapman**, RN, PhD, an associate professor of social and behavioral sciences, and **Bethany Phoenix**, RN, PhD '97, vice chair of the Department of Community Health Systems, received a grant from the Robert Wood Johnson Foundation's Future of Nursing National Research Agenda. The funding will be used to examine opportunities and barriers that affect the ability of nurse practitioners specializing in psychiatry and mental health to effectively use their skills and expertise in public mental health settings.

James Fraser, PhD, an assistant professor of bioengineering and therapeutic sciences in the schools of medicine and pharmacy, was named a 2014 Searle Scholar. The award, which is given annually to 15 young scientists nationwide, will support Fraser's research into more accurately and precisely describing the ways that protein molecules change shape to carry out the functions of life in the human body.

Three researchers with UCSF ties received the 2013 Presidential Early Career Award for Scientists and Engineers. The honorees were **Karunesh Ganguly**, MD, PhD, a resident alumnus, assistant professor of neurology in the School of Medicine, and member of the Center for Neural Engineering and Prostheses; **Shingo Kajimura**, PhD, an assistant professor of cell and tissue biology in the School of Dentistry and a research scientist at the UCSF Diabetes Center; and medical geneticist **Katherine Rauen**, MD, PhD, a resident alumna and former director of the UCSF NF/Ras Pathway Clinic. They were among 102 scientists chosen to receive this award, which honors individuals in the early stages of their independent research careers.

Zev Gartner, PhD, an assistant professor of pharmaceutical chemistry in the School of Pharmacy, received a 2013 National Institutes of Health Director's New Innovator Award. Read about his work building 3-D human tissue on page 9.

Deborah Greenspan, DSc, chair of the Department of Orofacial Sciences in the School of Dentistry, and **John Greenspan**, PhD, a Distinguished Professor in the schools of dentistry and medicine and associate dean for Global Oral Health, were inducted as Fellows of the International College of Dentists.

Neuroscientist **Regis Kelly**, PhD, director of the California Institute for Quantitative Biosciences, was awarded the title of Officer of the Most Excellent Order of the British Empire (OBE) by Queen Elizabeth II for his services to science, innovation, and global health. A native of Scotland, Kelly was among 1,195 people selected this year to receive one of Great Britain's highest honors.

The UCSF Elev8 Healthy Students and Families Program – directed by **Naomi Schapiro**, RN, PhD '12, CPNP, a health sciences clinical professor in the School of Nursing – and the Alameda County Center for Healthy Schools and Communities were presented with the American Association of Colleges of Nursing's first Exemplary Academic-Practice Partnership Award. Funded by a three-year, \$1.75 million grant from The Atlantic Philanthropies, Elev8 involves faculty and students from the schools of dentistry and nursing in a new, integrated model of primary health and dental care at five of Oakland's middle schools.

Steven Schroeder, MD, a Distinguished Professor of Health and Health Care and the director of the Smoking Cessation Leadership Center, received the Institute of Medicine's Gustav O. Lienhard Award for 2013, in recognition of his pioneering efforts to control tobacco use, his leadership in general internal medicine, and his work to improve end-of-life care. Schroeder is a former president of the Robert Wood Johnson Foundation and the founder of UCSF's Division of General Internal Medicine.

The School of Dentistry's **Margaret Walsh**, BS '69, EdD, a professor of preventive and restorative dental sciences and the director of the Master of Science Program in Dental Hygiene, received the 2013 Esther Wilkins Lifetime Achievement Award in recognition of her many contributions to the field of dental hygiene.



FOR CULTURING CURES

UCSF scientists explore the bacterial communities that live in and on our bodies to find treatments for disease.

By Claire Conway

Long ago, when Andrew Goldberg, MD, was a resident, the ear, nose, and throat specialist had a patient who came in repeatedly with a chronic infection in one ear. The man had been prescribed all manner of treatments – from vinegar drops to antibiotics to antifungals to steroids – none of which provided lasting relief. Then one morning, the patient walked into the office and asked Goldberg to take a look in his ear – the infection was wiped out. “Don’t you want to know what I did?” Goldberg recalls the patient asking, with a grin.

“So he tells me,” Goldberg continues, “I took some wax from my healthy ear and stuck it in my bad ear. Within a few days, my problem was gone and never came back.’ Of course I laughed it off, thinking that the infection had spontaneously cleared and that the guy was crazy,” reflects Goldberg, who is now the director of Rhinology and Sinus Surgery at UC San Francisco.

Decades later, when he began investigating the myriad bacterial communities thriving in the human body, Goldberg realized what a clever, if not desperate, move his patient had made. His good ear hosted an abundant and

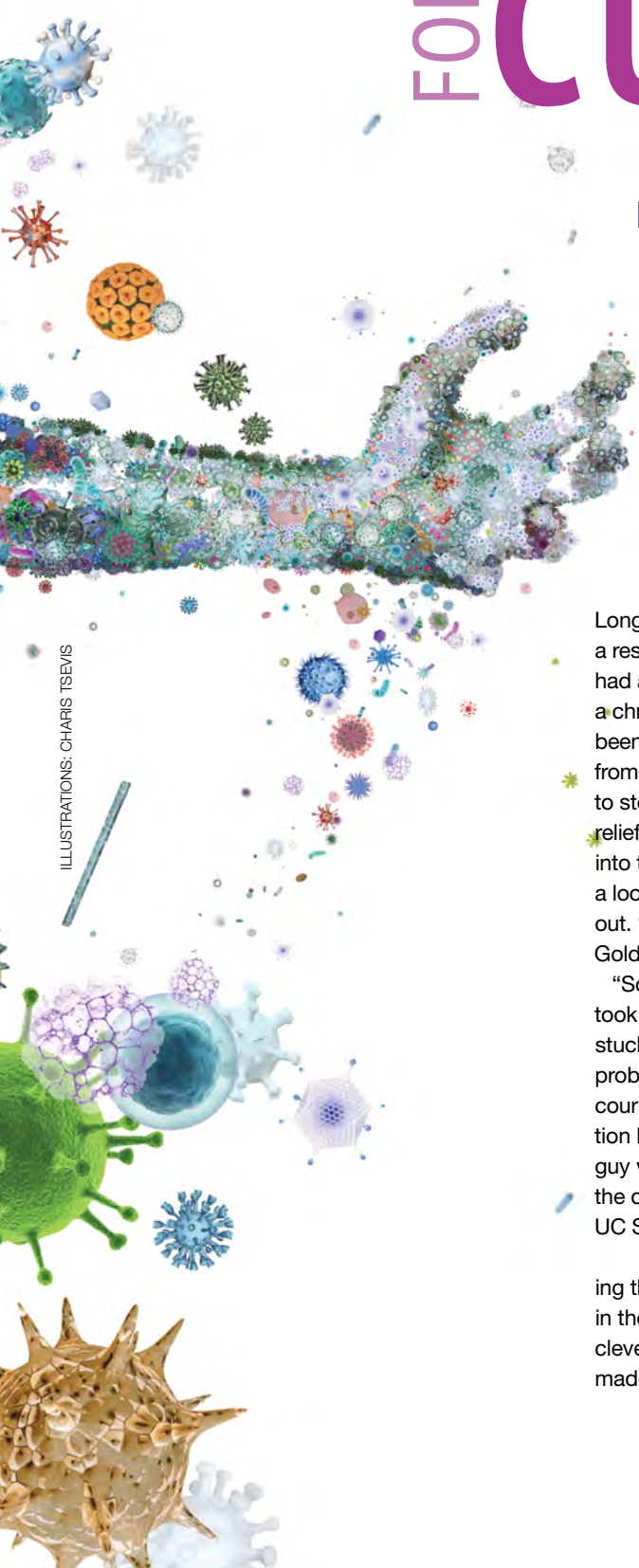
stable microbial community, while his bad ear had a depleted population of microbes that left it in a chronic inflammatory state. The bacteria in the wax from his good ear had brought the other ear back to healthy harmony.

That patient’s recovery hints at the enormous therapeutic potential of the human microbiome – the 100 trillion bacterial cells living in and on our bodies. Such cells outnumber the body’s own cells 10:1. They are housed primarily in our gut, where roughly 70 percent of the components of our immune system reside. Scientists are hard at work trying to leverage the extraordinary healing powers of the microbiome, mining it for treatments of a variety of conditions, including asthma, irritable bowel syndrome, and obesity.

And for good reason, according to microbiologist Michael Fischbach, PhD. “One third of all human medicines are made by bacteria,” he says. “Clearly, they are the best chemists on the planet.” His lab studies how simple microorganisms create drugs with such proficiency. “Over the past 20 years, people have done seminal work uncovering which genes enabled microorganisms to synthesize wildly complex drugs,” he says. “For me, the trick is to be able to find other genes that look similar enough that I know they are there to make a drug.” The process used to be an arduous one, involving a great deal of luck while combing for bacteria through the soil or the ocean, where the vast majority of such drugs have traditionally been found.

That all changed with improvements in genetic sequencing and computational technology. Now, Fischbach uses his computer to scan every bacterium whose genome has been sequenced for drug-producing genes. As expected, his searches have turned up

ILLUSTRATIONS: CHARIS TSEVIS



many drug-producing genes in ground- and marine-dwelling bacteria. “But I was shocked to see so many in the human microbiota. You used to have to travel to the coast of Palau to mine the ocean sediment for drugs,” says Fischbach, an assistant professor of bioengineering and therapeutic sciences. “Now we can just check our gut!”

EMBRACING OUR INNER PHARMACY

Day in and day out, gastrointestinal microbes go about the care and maintenance of our bodies by extracting vitamins from the food we eat, goading our immune systems into action when need be, and producing the anti-inflammatories and antibiotics that keep us well. “The human microbiome is basically a drug factory,” says Fischbach. He is hard at work trying to discover its best products.

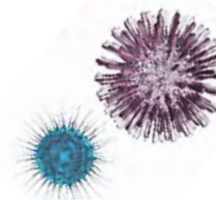
He and UCSF Executive Vice Chancellor and Provost Jeffrey Bluestone, PhD, an immunologist, study a very promising gut bacterium called *Bacteroides fragilis*. It produces a chemical that resembles a well-known immunomodulatory drug that was discovered in a sponge off the coast of Japan 20 years ago. Fischbach and Bluestone, who holds the A.W. and Mary Margaret Clausen Distinguished Professorship in Metabolism and Endocrinology, predicted that the chemical would have a similar effect on the immune system, and they were right: The chemical produced by *B. fragilis* interacts with a type of human immune cell called a natural killer T cell. That meant it could be very useful in treating allergic and autoimmune diseases.

Lactobacillus johnsonii is another gut bacterium with extraordinary therapeutic potential. Susan Lynch, PhD, an associate professor of gastroenterology, homed in on the organism when trying to explain a curious fact: Children who grow up in homes with dogs are less likely to develop allergies and asthma. She designed a study that involved exposing two sets of mice to household allergens – one set to dust from homes with dogs, and the other set to dust from homes without dogs. “We found that mice exposed to the dog-associated house dust were protected against allergic inflammation or infection with a virus associated with the development of asthma,” says Lynch, who directs UCSF’s Colitis and Crohn’s Disease Microbiome Research Core.

To figure out what microbes may have been at work, Lynch compared the bacterial fingerprints of the two sets of mice and found that approximately 100 different organisms were present in higher levels in the gut microbiomes of the protected mice; one of them was *Lactobacillus johnsonii*. She isolated this species from the mouse gut, fed it alone to another set of mice, and found that this resulted in airway protection, though to a lesser extent than exposure to dog dust did.

“This tells us a number of important things,” says Lynch. “First, that the *Lactobacillus johnsonii* did not act alone – it requires specific microbial partners to afford full airway protection. It also suggests that this full suite of protective organisms in the human body are not all native; they presumably can be sourced from the environment.” In other words, *Lactobacillus johnsonii* partners with bacteria from the dog-household dust to fight off pulmonary allergens. According to Lynch, this makes perfect sense, given that a bacterium

often relies on other bacteria to produce certain compounds, such as the amino acids it needs to survive.



MOB RULE

Overwhelming evidence suggests that one of the hallmarks of chronic inflammatory disease is an overall depletion of microbes. That’s why introducing a single organism into a microbial ecosystem that is out of whack may not always be effective; its partners may have been wiped out by the illness or, paradoxically, by an antibiotic intended to cure it.

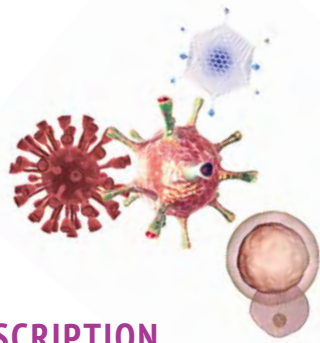
“We are after the core set of microbes that are essential to creating a healthy microbial ecosystem,” says Lynch. “Our data supports the idea that *Lactobacillus* represents an anchor or keystone organism in such communities.” Its presence, in other words, dictates which other organisms are present and how they behave – and that ultimately influences a person’s immune response.

In fact, *Lactobacillus johnsonii* is known to play a powerful role in newborns’ immune systems even before their first breath. “*Lactobacillus johnsonii* represents one of the major species in the microbial inoculum that a vaginally born newborn receives,” says Lynch. “We think it’s critical in structuring or priming development of the microbial community in early life, the period during which the immune response matures.” Proof of its importance can be measured by its absence. Children born by cesarean section – and therefore not exposed to *Lactobacillus johnsonii* or other potentially protective species in the mother’s vaginal tract – have a 30 percent higher risk of developing allergic asthma during childhood.



A DELICATE BALANCE

An individual’s microbiome is best described as an ecosystem – a complex communal environment teeming with thousands of different types of microorganisms. Some of them are dependent upon one another for survival, while others simply coexist. In even the healthiest of microbiomes, there are microbes known to promote health and those known to cause disease. These bad actors live in check until an illness, or perhaps even an antibiotic, starts to deplete their neighbors, thereby unraveling a peaceful coexistence. All the while, the community fights to right itself by beating back the bad and replenishing the good until neighborhood demographics and order are restored.



BACTERIA BY PRESCRIPTION

Clearly, *Lactobacillus johnsonii* has a long and proven history of having a positive therapeutic effect on the body. But what might a microbial agent look like if it were crafted specifically as an asthma drug?

The first consideration would be when to intervene. Though diseases such as childhood allergic asthma do not manifest clinically until a child is about 6 years old, Lynch believes that their genesis lies in events that occur very early in life. “Essentially, we are trying to build and sustain an appropriate microbial bioreactor in the infant gut,” says Lynch. “We would likely begin in early life, from birth, with supplementation strategies that manipulate the microbial community in a way that benefits the child.” Such a therapeutic might take the form of a dehydrated but viable microbial species mix, not unlike current probiotic supplements, which would be added daily to the infant’s diet. It would be given from birth through the first few months of life, since that seems to be the critical period in the assembly of a hardy, healthy microbial community.

Even after the right microbes are introduced, they would have to be maintained to give them staying power. “We also need to investigate nutritional interventions to promote the longevity of these organisms that we are introducing into the system,” explains Lynch. “These are known as prebiotics – the complex carbohydrates and fibers that fermentative organisms, like the *Lactobacilli*, prefer to gnaw on.”

There are prebiotics on store shelves right now, but, like the probiotics next to them, they are fairly blunt tools. The prebiotics of the future will be specifically tailored to the nutritional preferences of the bacteria that are being used as therapeutic agents. “Right now, prebiotics are typically broad-spectrum complex carbs that increase the presence of certain beneficial organisms that readily metabolize them,” says Lynch. “But this will only occur if those organisms are present in the first place; many good bacteria are depleted with disease and inflammation.”

BEST BET

The treatment from the human microbiome that’s closest to being realized is for a condition caused by a bacterium called *Clostridium difficile*. It’s a rare and painful affliction of the bowels that typically occurs as a result of antibiotic treatment. “Antibiotic use depletes the gut of some of the important components of its community and allows for overgrowth of *C. difficile*, a pathogenic bacterium,” explains Andrew Goldberg. This causes gastrointestinal distress, diarrhea, and fluid loss – and can be fatal.

The current protocol calls for still more antibiotics. However, recent research done in the Netherlands may ultimately change that. In a well-

controlled trial of patients with *C. difficile*, half were given antibiotics and the other half received fecal transplants from a healthy individual, typically someone in the same household who had been exposed to the same environmental bacteria. “The study was stopped before completion,” says Goldberg, “because the effectiveness of the fecal transplant was so high that it was felt to be unethical to continue the standard treatment in those patients.” Physicians believe that this finding will also have very positive implications for patients with other gastrointestinal diseases, such as inflammatory bowel disease. There are currently several ongoing trials of fecal transplantation in the United States. If the efficacy of the treatment proves to be as good as or better than the current protocol

“You used to have to travel to the coast of Palau to mine the ocean sediment for drugs. Now we can just check our gut!” – Michael Fischbach

for patients with recurrent *C. difficile*, the FDA would likely fast-track the fecal transplant, says Lynch, making it immediately available.

Until other treatments derived from the human microbiome are honed into viable therapeutics, antibiotics will likely remain the treatment of choice for many of the illnesses that plague us. At first glance, the two strategies appear to approach such illnesses from opposite directions: Antibiotics kill the bad actors, while probiotics and prebiotics bolster defenses to restore order. And some argue that antibiotics take out the good with the bad, potentially pushing a microbial community further off kilter, as is the case with *C. difficile*. “We found in mice that antibiotics actually made it easier for a pathogen to grab hold and to create a disease state,” says Goldberg, primarily because the good actors hadn’t survived to intervene.

Yet Fischbach predicts that, ultimately, the two approaches will be combined. In the future, he believes, antibiotics will likely be followed by what he calls a “probiotic-chaser,” to help re-assemble the microbial community, while prebiotics may be used for health maintenance.

In the meantime, the field needs to figure out exactly how microbes engage our immune system to make us well, according to Fischbach. Only then will we be able to make effective use of a resource that has been, quite literally, under our noses as long as we have walked the planet.

“Drug companies spend an enormous amount of time and money trying to develop a single drug and get it into your gut at an appreciable concentration,” observes Fischbach. “Yet we have bacteria already in our gut, probably producing dozens of drugs and affecting our biology and health in profound, very specific ways. Understanding how that works, I hope, is the legacy of what we are doing in this field right now.”



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ONLY UCSF 150

Lured by the Gold Rush, UCSF's founding father, South Carolina surgeon Hugh Toland, ventured west. As we mark the 150th anniversary of the institution he launched, we celebrate the pioneers, visionaries, and mavericks whose curiosity and collaboration have led to major scientific breakthroughs and to advances in education and training that enhance and save lives. The following 50 milestones are but a few of UCSF's triumphs.



1864 Hugh Toland opens Toland Medical College in San Francisco's North Beach; it's now the West's oldest medical school in continuous operation. Nine years later, the college is deeded to University of California, which was established in 1868.



1872 City and County open San Francisco General Hospital (SFGH) on Potrero Avenue, starting UCSF's long public health partnership with the hospital.

1876 Wisconsin native Lucy Wanzer becomes first woman to graduate from a California medical school, the nascent UCSF.

1895 Governor James Budd signs \$250,000 appropriation for the Affiliated Colleges buildings. Mayor Adolph Sutro donates 13 acres of land on Mount Parnassus to UC's medical, dental, and pharmacy departments, School of Veterinary Medicine, and Hastings College of the Law.

1907 UC opens its first teaching hospital, located on the Parnassus campus. University of California Training School for Nurses also founded. Margaret Crawford, a highly regarded graduate nurse from St. Luke's Hospital School of Nursing, becomes first director.

1918 Influenza pandemic rages, with 23,639 reported cases in San Francisco. UC Training School deploys nurses to emergency hospitals set up throughout the city.



1872 California College of Pharmacy founded; in 1873, it affiliates with University of California.

1881 UC Regents establish the West Coast's first dental school, which later becomes UCSF School of Dentistry.

1906 San Francisco sustains a 7.7-magnitude earthquake and fire. UCSF sets up makeshift hospital for patients on Parnassus Avenue and cares for the injured among the 40,000 who take shelter in Golden Gate Park.

1911 Anthropologist Alfred Kroeber brings Ishi, last survivor of Yahi Indian tribe, to the Parnassus campus. Ishi, who makes the anthropology museum his home, dies of tuberculosis in 1916.

1923 Anatomist Herbert Evans and colleagues discover vitamin E. He also discovers animal pituitary growth hormone in the 1940s.

ONLY UCSF150

1961 UCSF establishes Graduate Division, with programs housed within all four professional schools.



1929 Alumnus Howard Naffziger appointed chair of Department of Surgery. Develops first surgical residency program in the western United States.



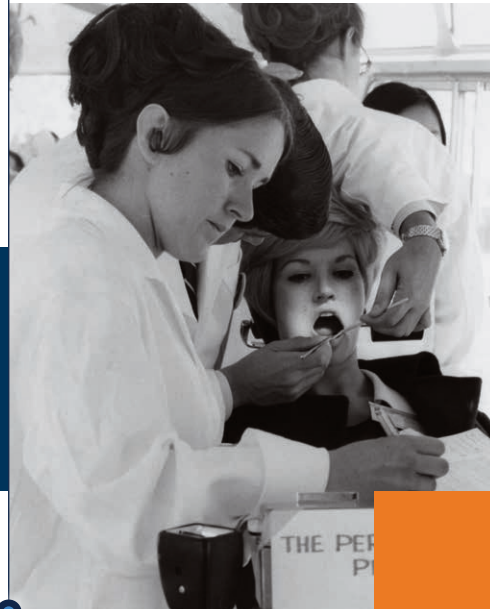
1964 UCSF becomes ninth campus in UC system and only one devoted exclusively to health sciences.



1963 John Karam, later chief of clinical endocrinology, and Gerold Grodsky, now a professor emeritus, are first to link obesity to type 2 diabetes, resulting in revolutionary changes in diabetes treatment and prevention.

1964 Lloyd "Holly" Smith, chair of the Department of Medicine, nurtures what eventually becomes UCSF's world-class biomedical science research program.

1965 School of Dentistry begins mobile clinics program, establishing long tradition of community outreach to the underserved in San Francisco and the Bay Area.



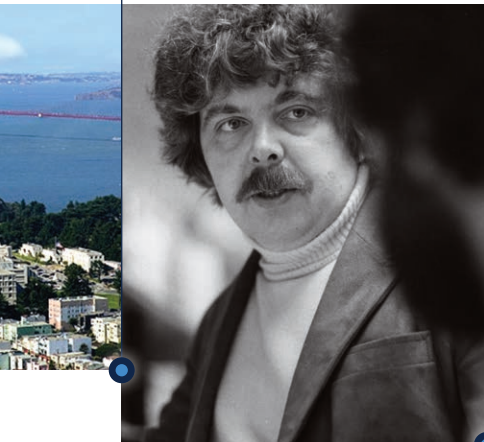
1965 UC Regents approve Doctor of Nursing Science program – first in the western United States. Alumna Shirley Chater, an early professor in the program, becomes commissioner of the US Social Security Administration in 1993.

1966 School of Pharmacy tests use of clinically skilled pharmacists in a patient care setting for first time, ushering in the clinical pharmacy program – first in the US. Alumnus and Associate Dean Jere Goyan, later dean and then commissioner of the US Food and Drug Administration, was instrumental in starting the program.



1967 African-American surgeon Samuel Kountz takes over as director of the kidney transplant program, making the service the world's largest and prototyping a device to preserve the organ for hours after removal – now standard equipment in hospitals.

1968 After decades of collaboration, School of Medicine agrees to manage patient care, teaching, and research at the San Francisco VA Medical Center.



1973 UCSF's Herbert Boyer and Stanford's Stanley Cohen develop recombinant DNA technology, revolutionizing biology and spawning the biotechnology industry. Three years later, Boyer cofounds Genentech, world's first biotech company. UCSF postdoctoral alumnus Arthur Levinson joins Genentech in 1980 as one of its first scientists and later serves as CEO. Boyer and collaborators win Albert Lasker Basic Medical Research Award (1980), National Medal of Technology (1989), and National Medal of Science (1990).

1976 Y.W. Kan, internationally recognized geneticist, pioneers design and implementation of prenatal DNA screening tests for sickle cell anemia, thalassemias, and other single-gene disorders. Kan wins many honors, including Albert Lasker Clinical Medical Research Award (1991) and Shaw Prize in Life Science and Medicine (2004).

1979 Otolaryngologists Robin Michelson and Robert Schindler, both alumni, and neuroscientist Michael Merzenich, a pioneer in brain plasticity research, develop the first neural prosthetic – a cochlear implant that enables the deaf to hear.

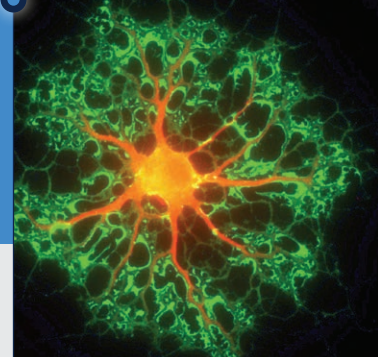
1969 Four UCSF faculty – John Clements and alumni William Tooley, Roderic Phibbs, and George Gregory – pioneer a treatment for infant respiratory distress syndrome that dramatically improves babies' survival rates. A decade later, Clements, Phibbs, and colleagues develop synthetic surfactant.



1974 Neurosurgeons John Adams, an alumnus, and Yoshio Hosobuchi use a breakthrough technique called deep brain stimulation, inserting an electrode deep in the brain to activate the body's own pain control centers and relieve chronic, debilitating pain.

1977 Biochemist William Rutter and colleagues achieve first major triumph of genetic engineering by isolating gene for rat insulin and transplanting it into bacteria. Leads to mass production of genetically engineered insulin to treat diabetes.

1981 Anatomy Professor Gail Martin isolates precursor cells from mouse embryos – and coins the term “embryonic stem cells” – laying groundwork for worldwide research on use of human embryonic stem cells to treat disease.



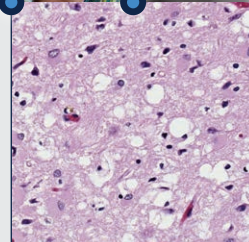
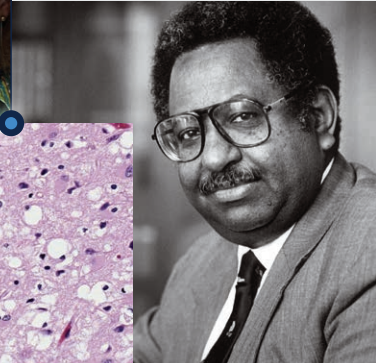
1981 Michael Harrison, international expert in fetal surgery, along with Mitchell Golbus, an alumnus, and Roy Filly, performs first successful corrective procedure on a fetus still in the mother's womb, pioneering the clinical specialty of fetal diagnosis and in utero treatment. He establishes first fetal treatment center in the US.

1983 UCSF virologist Jay Levy, an alumnus, codiscovers HIV, the virus that causes AIDS. He and colleagues go on to make many early observations about AIDS, including the description by School of Dentistry faculty John Greenspan and Deborah Greenspan of hairy leukoplakia, often the first sign of HIV infection.

1995 Alumnus and Professor Stanton Glantz publishes landmark *Journal of the American Medical Association* summary of Brown & Williamson documents, revealing the tobacco industry knew since 1962 that nicotine is addictive and smoking causes cancer.

1997 Cynthia Kenyon discovers gene activity can be manipulated to alter life span, as evidenced by research showing that changes in a single gene in *C. elegans* more than double the roundworm's life span.

1997 Haile Debas becomes UCSF's seventh chancellor. In 2003, he founds Global Health Sciences, integrating UCSF expertise in all of the health, social, and biological sciences and focusing it on pressing issues in global health.



1983 SFGH Chief of Medicine Merle Sande and others develop nation's first outpatient AIDS clinic and first inpatient ward. With other experts, including alumni Julie Gerberding and Paul Volberding, he crafts the San Francisco model of AIDS therapy, a rational approach designed to avoid paranoia. Gerberding later becomes first woman to direct US Centers for Disease Control and Prevention.

1989 J. Michael Bishop and Harold Varmus win UCSF's first Nobel Prize for discovering proto-oncogenes, normal genes that demonstrate the potential to convert to cancer genes. This transforms the way scientists look at cancer and leads to new strategies for detection and treatment.

1996 Alumni and faculty members Robert Wachter, noted patient safety expert, and Lee Goldman, chair of medicine, coin the term "hospitalist" in a *New England Journal of Medicine* article. Hospitalists focus on caring for hospitalized patients; the field is now medicine's fastest-growing specialty.

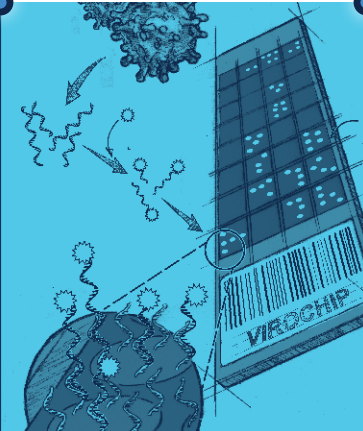
1997 Alumnus and faculty member Stanley Prusiner wins Nobel Prize for his discovery of prions, infectious pathogens that cause fatal neurodegenerative diseases such as bovine spongiform encephalopathy, known as "mad cow disease."

1999 UCSF breaks ground for the first research building at Mission Bay; the \$3-billion campus is considered the most important single endeavor UCSF has undertaken in its history.

2002 Alumnus Richard Carmona, noted trauma surgeon and police officer, is appointed US surgeon general by President George W. Bush.

2002 Jeffrey Bluestone, now executive vice chancellor and provost, demonstrates through clinical trials that a new immunosuppressive drug successfully halts the progression of type 1 diabetes.

2008 Surgeons Nancy Ascher, Charles Hoopes, and John Roberts perform the 10,000th procedure in the UCSF Organ Transplant Service, one of the largest and oldest in the world.



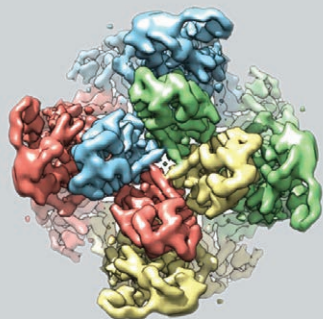
2001 Roger Pedersen leads creation of two of the first human embryonic stem cell lines in the world, enabling scientists to study how stem cells might be used to treat cancer, heart disease, diabetes, and birth defects.

2002 Two faculty members – biochemist Joseph DeRisi and virologist and alumnus Donald Ganem – develop the ViroChip, a microarray containing DNA from every known virus. First used in 2003 to identify the virus that causes severe acute respiratory syndrome (SARS), it has proven to be a valuable experimental diagnostic tool for identifying previously unknown viruses in both humans and animals.

2007 School of Medicine expands enrollment for first time in three decades with launch of Program in Medical Education for the Urban Underserved (PRIME-US), aimed at educating and inspiring students to address health disparities.

2009 Molecular biologist Elizabeth Blackburn receives, with two other scientists, Nobel Prize for codiscovering telomerase, an enzyme that is key in normal cell function, cell aging, and most cancers.

2010 Physiologist David Julius wins Shaw Prize in Life Science and Medicine for discovering molecular mechanisms by which the sense of touch allows us to perceive pain, temperature, and other sensations.



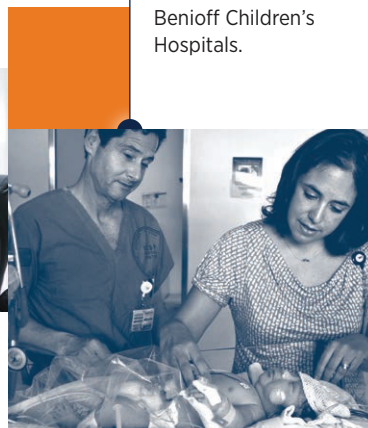
2012 UCSF Professor Shinya Yamanaka, senior investigator at the UCSF-affiliated Gladstone Institutes, shares Nobel Prize for discovering how to transform ordinary adult skin cells into cells that, like embryonic stem cells, are capable of developing into any cell in the human body.



2012 Ronald Vale and two other scientists win Albert Lasker Basic Medical Research Award for work spanning three decades that has helped illuminate how the heart beats and how cells transport material internally.



2013 Led by alumna and precision medicine pioneer Chancellor Susan Desmond-Hellmann, UCSF convenes more than 170 of world's foremost thinkers, creators, and innovators for first-ever OME Precision Medicine Summit to identify ways to make medicine more predictive, preventive, and precise. In 2014, Desmond-Hellmann becomes CEO of the Bill & Melinda Gates Foundation.



2014 UCSF Benioff Children's Hospital affiliates with Children's Hospital & Research Center Oakland, building on the institutions' mutual commitment to provide outstanding care for children in local communities and to advance medical discovery and treatment for the world. Together, the hospitals are named UCSF Benioff Children's Hospitals.

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Hellen Aitel at home with her son, Stephen Aitel.

Homeward Bound

Strong-willed and a little feisty, Hellen Aitel reached her 90s enjoying a mostly self-sufficient life. Until she had surgery in 2012.

By Anne Kavanagh



“She walked into the hospital and came home in a wheelchair,” says her son, Stephen Aitel. Hellen Aitel’s condition deteriorated further after a stint in a rehabilitation center, but she was determined to return to her home near Lake Merced in San Francisco.

The stairs in Aitel’s two-story house loomed as a major obstacle. Her son had to arrange medical transport for every doctor visit, turning a simple appointment into a stressful event that left both mother and son drained. A constellation of problems – including lack of mobility, high blood pressure, fluid in her lungs, and pain from rheumatoid arthritis – conspired to further impact her health.

That’s when geriatrician Helen Kao, MD ’03, stepped in with a powerful tool – her car.

It carries her up and down San Francisco’s hills to visit frail residents who cannot surmount the city’s steep streets, or even the precipitous steps out their own front doors. For Kao, who is the medical director of geriatric clinical programs at UC San Francisco, these visits allow her to practice the kind of care that she and her colleagues find to be best for older patients: individualized and team-based.

This approach shapes much of their work, from the flagship Housecalls program – a practice from days past that’s gaining renewed traction – to a new program for patients with complex psychosocial medical needs. And it’s an approach grounded in leading research by UCSF experts in the Division of Geriatrics who care for older people every day in clinics, hospitals, and homes. Their work – which helped UCSF Medical Center earn a top-10 ranking for geriatrics in *U.S. News & World Report’s* most recent survey of the nation’s best hospitals – is transforming health care for the burgeoning population of older adults in the United States.

TAILORING CARE FOR THE SILVER SURGE

Every day, roughly 10,000 Americans turn 65. The growth in the number of older adults is unprecedented in the history of the United States, fueled by longer life spans and the aging of the baby boom generation. For older adults, a one-size-fits-all path to health care falls short, say faculty members in UCSF’s Division of Geriatrics.

“If you’ve seen one older patient ... you’ve seen one older patient,” points out Kenneth Covinsky, MD ’88, MPH, who holds the Edmund G.

Two out of three older Americans have multiple chronic conditions; in fact, 95 percent of health care costs for those 65 or older are for chronic diseases.

Brown Sr. Distinguished Professorship in Geriatrics. “What’s right for an older person hinges on their full medical and social context.”

For starters, older adults tend to need the most care, yet most medical studies exclude participants over 75, says Louise Walter, MD, a resident alumna and chief of the Division of Geriatrics. “If you do the same thing to an 85-year-old as a 50-year-old, you’re probably going to cause harm,” she explains. In studying diabetes, for example, Associate Professor Sei Lee, MD, also a resident alumnus, found that guidelines developed for managing the disease in younger people led to overly aggressive management of blood sugars in older adults, increasing their risk for hypoglycemia.



Geriatricians with a personal touch (from the left): Rebecca Conant, left, an expert in the benefits of house calls; Louise Walter, chief of the Division of Geriatrics; and Michael Steinman, rear, a national leader in improving how medications are prescribed for older adults with complex health problems.

Complicating matters, many older adults are grappling with multiple chronic conditions. But most research is conducted on people with a single disease who are otherwise relatively healthy. “We’re learning that what’s right for the individual disease is often not right for the patient,” adds Covinsky.

MEDICATION DELUGE

For older patients with multiple conditions, “the medications can pile up quickly,” says Michael Steinman, MD, an associate professor and resident alumnus who studies the problems caused by simultaneous use of multiple drugs. For example, a medication used to treat one disease may have an adverse effect on another disease, or one drug may interact poorly with another.

Side effects are often indistinguishable from symptoms, he adds, which can create a troubling “prescribing cascade.” Say a patient with heart failure takes furosemide, a diuretic also known as Lasix. That can lead to urinary incontinence, so the doctor might prescribe another drug to treat that condition. But that drug could cause cognitive impairment, so the doctor might conclude that the patient has dementia. So yet another drug is prescribed to treat that problem. And on it goes. “A better approach would be stopping or changing the first drug,” Steinman explains.

He is currently partnering with pharmacists to create evidence-based guidelines to improve how doctors prescribe medications for older adults. “We want to help make sure they don’t get too many medications or too few, but the right ones that are tailored to their needs,” he says.

AGE IS NOT A NUMBER

Numerical age, it turns out, is not the best guide when caring for older adults – another reason why tailoring care to the individual is so critical.

Division Chief Walter learned this early in her career when she felt stymied by cancer screening guidelines based on age. She had a robust 80-year-old patient who still enjoyed hiking but who couldn’t get a mammogram because she was over the age cut-off. Yet she also had a very frail 75-year-old patient with dementia who could. “I thought, ‘That’s crazy,’” she recalls.

Her 80-year-old patient was more likely to benefit from screening, Walter reasoned. And her dementia patient was more likely to be harmed, since inconclusive results can lead to biopsies and other invasive procedures that might exacerbate her existing illness. The dementia patient was also likely to die from dementia before an abnormality detected by screening could cause symptoms. In a series of seminal studies, Walter went on to demonstrate that life expectancy

Since January 2011, roughly 10,000 Americans have turned 65 every day – a rate that will continue for almost two decades.

is more important than age in determining the benefits and risks of cancer screening.

Her work transformed national cancer screening guidelines and, more recently, led to the development by several Division of Geriatrics faculty members of an app for iPhones and iPads. Called ePrognosis: Cancer Screening, the app guides clinicians in talking with older patients about whether to start, stop, or continue screening for breast cancer and/or colorectal cancer.

Covinsky, who directs UCSF’s Claude D. Pepper Older Americans Independence Center, one of only 14 centers of excellence funded by the National Institute on Aging’s Pepper Centers program, has also exposed the limits of decision-making based on age. In groundbreaking research, he demonstrated that patients’ functional status – their ability to bathe, dress, walk, eat, manage their medications, and perform other everyday tasks – is far more relevant than age in predicting

A DOSE OF LEGAL HELP

UCSF geriatrician Carolyn Welty, MD, sometimes sends her patients to see a different kind of specialist – a lawyer-in-training.

The unusual referrals stem from a collaboration between UCSF and UC Hastings College of the Law. Called the Medical-Legal Partnership for Seniors (MLPS) and launched in 2012, it's one of just a few such programs nationwide that provide health-related legal assistance to older adults.

Welty's patients at the UCSF Center for Geriatric Care may need help with powers of attorney, advance directives, or estate planning. Or she may suspect that they qualify for public benefits they aren't receiving. A lawyer can help with any of those endeavors. But for many older adults, consulting an attorney is a daunting prospect – and most simply can't afford the fees.

Instead, Welty, who is medical director of the MPLS, and other physicians point their patients to participating law students from UC Hastings. Each semester, eight students spend 12 to 15 hours a week advising older patients, either at the center or in the patients' homes. While some patients are wary of lawyers, they usually agree to the visits because "they trust their doctors," says Yvonne Troya, JD, legal director of the MPLS and a UC Hastings clinical professor of law.

The students mostly help clients complete advance health care directives, durable powers of attorney for finances, and simple wills, and they also perform a full "legal check-up," explains Troya. For example, some clients don't realize that they may be eligible for food stamps or that they can appeal reductions made in their Social Security or Medicare home health benefits. But serving clients isn't solely about filling out legal forms, says Melis Atalay, a third-year law student who participated in MLPS last semester. "It's to eliminate stress in their lives."

"I've seen it time and again, where patients haven't planned ahead and some crisis occurs," concurs Welty. "The stress can affect their health."

For students, the partnership offers an opportunity to work directly with clients and to learn about the growing field of health care law. And it can mean much more besides. "It was the best part of my law school experience so far," says Atalay. "It taught me a lot about myself and who I want to be."

their health outcomes. In addition, he's shown that functional status – especially mobility – can reveal more about patients' health than their diseases can.

"One of the first things I look at with patients is how they get from the waiting room to the clinic," he says. "Before I even start thinking about their diseases, I'm thinking about how they function and what they need to function better."

Yet even the complex mix of functional ability, diseases, medications, and life expectancy still only tells part of an older person's health

In 2004 (the most recent data available), the 65-and-over demographic accounted for 34 percent of US health care expenditures, while making up only 11 percent of the population.

story. A slew of psychosocial conditions can interact with illness to leave an individual impaired, says Kao, the geriatric clinical programs' medical director. All these myriad pieces must be viewed through an essential lens: the patient's own goals.

"We really try to balance what is available in our medical armamentarium with what is going to help the patient achieve their goals," explains Kao, who is also a resident alumna. "We might be able to do some procedure, but it may never really benefit them and might actually cause harm."

HOME TEAM

In the end, no one health care provider can do it all.

"When you think about trying to address the kinds of issues [older adults face], the perspectives of multiple disciplines become increasingly valuable," says Margaret Wallhagen, RN, PhD. An alumna of UCSF's School of Nursing, she directs the UCSF/John A. Hartford Foundation Center of Gerontological Nursing Excellence.

Kao, too, understands the wisdom of casting a wide net. Last year, she partnered with UCSF's primary care clinics to create a dream team of sorts to focus on patients with complex psychosocial medical needs. Most of the participating patients were older adults, and all ended up frequently in the hospital or emergency room – a major red flag for geriatricians. "You could pin it on our lapels: do whatever we can to keep patients out of the hospital," says Kao. One such patient – a 71-year-old woman with coronary artery disease, hypertension, asthma, recurring vertigo, breast cancer, and a brain lesion – visited the emergency room 10 times in 12 months and was hospitalized twice.

To determine why, and to avoid such patterns in the future for these patients, Kao brought together health care providers from across UCSF: primary care physicians, geriatricians, nurse practitioners, and pharmacists. And through UCSF's community partner, the Institute on



Helen Kao, director of geriatric clinical programs, while making a house call on Hellen Aitel in 2013.

Aging, she included social workers and psychologists, too. Each participating patient is assigned a team, which is guided by the patient's primary care provider. To start with, a nurse practitioner and a social worker assess the patient in his or her home, then the team members meet weekly to share their expertise in developing and monitoring a highly individualized care plan.

Kao also oversees UCSF's Housecalls program, which embodies why individualized, team-based care is effective – and is gaining steam. The number of house calls made in the United States on homebound patients covered by Medicare has grown steadily over the past decade, from 1.6 million in 2001 to 2.6 million in 2011, according to the American Academy of Home Care Physicians.

Staffed by geriatricians and a gerontological nurse practitioner, Housecalls serves more than 160 homebound, mostly low-income San Francisco seniors. For many, the Housecalls visits are their only lifeline to the health care system besides the emergency room. The program also connects patients with community services. "Getting people hooked up to social services is a critical part of caring for them at home," explains Associate Professor Rebecca Conant, MD '96, a resident alumna, and a national expert in the field.

Home visits convey the big picture, she says. "We see what's going on in terms of family support, living conditions.... Do they have adequate food? Heat? You don't get that in a clinic."

The team also meets spouses, children, and caregivers; hears life stories; and learns what the patients want out of their health care as they face the twilight of their years. Knowing *their* goals can avoid hospital visits that might be both costly and unhelpful.

Recently, one of Conant's patients suffered a stroke. After a long conversation with the patient's wife, who was adamant about keep-

ing him at home, Conant decided the best intervention was a home health referral to help with his care and with modifying his diet. The hospital could have run a battery of tests to assess the damage, but in the end that wouldn't have made a difference in his recovery, she says. "So there was no ambulance trip, no emergency room visit, no hospitalization."

Kao's patient Hellen Aitel became a Housecalls participant in early

The fastest-growing demographic in the United States is people 85 or over.

2013. "It was like the clouds parted and the sun came shining through," recalls her son, chuckling quietly. "It made everything so much easier on her – and me.

"One of the early questions Dr. Kao asked," he continues, "was 'What's important?'" The list for Aitel wasn't long: to walk again, to get relief from her arthritis pain, and to remain where she'd lived for 50 years. "My mother's life revolved around her home," Stephen Aitel says.

Hellen Aitel's team included home health nurse Barbara Schubach and physical therapist Jelin Hoh. They and Kao helped the 92-year-old walk again and encouraged her to be honest about her pain. "She was afraid of being perceived as a whining little old lady," says her son. "They were able to get through to my mom and took amazing care of her."

Hellen Aitel also wanted to stay at home as long as possible. "And darned if they didn't do it," he says, choking up. She died in late 2013, peacefully, at home.

Whether it takes the form of a leg up, a door opened, a steady hand, or an affirmation, mentorship is intrinsic to UC San Francisco. Such alliances are essential to guiding a protégé along the path to professional mastery. They may take root in a classroom, in an operating room, at an alumni gathering, or in a lab. The mentors and mentees featured on these pages have played an integral role in each other's lives – and likely will for a long time to come.

THE MENTORS

As told to Claire Conway

MICHAEL LOPEZ, DDS '74; owner, Mountain View Family Dentistry, Mountain View, Calif.; member, UCSF Dental Alumni Association (DAA) Executive Council; chair, DAA Student Relations Committee; member, UCSF School of Dentistry Dean's Advisory Board; member, Alumni Association of UCSF Board and Diversity Committee; trustee, Hispanic Dental Association (HDA); member, HDA National Faculty Advisor Committee

RUBEN ESPINOZA, third-year student, UCSF School of Dentistry; recipient, Dean's Scholarship for Opportunity; class representative and past co-president, UCSF Chapter, Hispanic Student Dental Association

LOPEZ: When Ruben comes upon good fortune, he asks himself how it can be shared. That's just how he thinks. He is spectacular – so bright and so committed.

ESPINOZA: The first time I spoke to Michael was on the phone, when I was trying to choose what dental school to attend. During the conversation I kept thinking, "Sure, I have people who are there for me. But this guy? He is actively reaching out and trying to connect with me." That was a first.

LOPEZ: Building community is so important. The wonder of this person here is that he was instrumental to fulfilling a lot of the social contracts his class made together. The Hispanic Student Dental Association flourished with Ruben and his Hispanic compatriots in the class.

ESPINOZA: We began with eight students, now we have 60. It's not exclusive to Hispanic people – we have opened the door to others. We do social and community outreach events, like free dental screenings for kids in struggling neighborhoods. I didn't come from a privileged background, so I can relate to the need.

LOPEZ: I have learned that when you see how people treat others around them, you get an inclination about how they will be around people in our community and in our society. I am so proud of what he has already accomplished, and he hasn't even graduated.

ESPINOZA: Whenever Dr. Lopez is here, he brings up the three R's – that's his thing: respect, relationships, reflection.

LOPEZ: I drill it into all our students: Have respect for yourself [and] the people around you – your classmates, faculty, the community. Create and value relationships. And take the time to reflect on your motivation.

ESPINOZA: He always brings everything back to the importance of meaning and happiness in everyone's lives and how that translates into being successful. That and the three R's summarize Dr. Lopez for me.

LOPEZ: Being associated with meaning and happiness? It doesn't get better than that! You don't wait for the opportunity to help each other. You create the opportunity and the culture of caring. Ruben is part of that.

ESPINOZA: Dr. Lopez has always been there for us. In a few months, we will graduate and be dentists, and then we will be colleagues.

LOPEZ: Ruben, from the first day I met you, we were colleagues. We have always been colleagues. That's the magic of it all.



PHOTOGRAPHY: STEVE BABULJAK

Ruben Espinoza and Michael Lopez, photographed at UCSF's Ray and Dagmar Dolby Regeneration Medicine Building, February 21, 2014.

ROBERT GIBSON, PharmD '58; Fulbright Scholar; former associate vice chancellor and associate dean, UCSF School of Pharmacy; former president, American Pharmacists Association (APhA) and American Association of Colleges of Pharmacy; winner, Remington Honor Medal, highest award bestowed by the APhA

SHARON YOUMANS, PharmD '85, MPH; vice dean and professor of clinical pharmacy, UCSF School of Pharmacy; fellow, APhA Academy of Pharmacy Practice and Management; six-time recipient, UCSF Apple Award for Teaching

GIBSON: Sharon was quick and smart, not the least bit intimidated in her [admissions] interview with me. I was associate dean for student affairs and head of minority recruitment at the time. I think she knew what she wanted to do, and if I got in the way, the hell with it.

YOUMANS: He was very approachable, a gentle giant whom I felt I could go to with anything. He always had the students' best interests at heart. Some weren't prepared academically, through no fault of their own, and Doc was there for them. He touched hundreds of student lives over the decades.

GIBSON: I liked her familiarity, but she was always respectful. From the very moment I met her, she called me "Doc," and she has called me that ever since.

YOUMANS: He was very proactive in recruiting minority students and was passionate about inclusion and social justice. Many years later, I chaired a diversity task force, and he wrote a historical perspective for me. It talked about how denying minorities access to college was an issue in the '70s. Decades later, it still is.

GIBSON: I had a grant to increase minority representation in pharmacy, so I took Sharon to the American Association of Colleges of Pharmacy meetings, and other large

professional gatherings, so she could meet the most important people in the profession. She was so bright; she didn't need any introductions – she just jumped right in.

YOUMANS: My first professional meeting was in New Orleans; Bob was responsible for sending me there. Then, when I graduated, he wrote me a letter of recommendation for the residencies I applied to. A residency director told me that one of my letters made it sound like I walked on water, and I instantly knew he was referring to Doc's. I never got to read it, but I did get the residency I wanted.

GIBSON: Sharon is exuberant and intent. Even as a student, no matter the setting, she was always absolutely aware of where she was, who surrounded her, and what needed to be done. I don't think you could surprise her. She might say she was surprised, but I wouldn't believe her.

YOUMANS: Doc has a wonderful sense of humor. You wouldn't guess that by looking at him, because he has such a regal and strong presence. But his laugh is his signature.

GIBSON: I am not at all surprised to see that Sharon has been appointed vice dean. By god, she was always going to get it done. I am so proud to see a mentee earn a responsible role in the school. I didn't get where I was all by myself. I needed help. So I turned around to prop open the door for someone who inspired me, and a bright, extremely competent woman just walked right in. And believe me, Sharon has shaken some of the old guard who still believe that years of submission to elders is the road to acceptance and the path to success.

YOUMANS: Our relationship has lasted over several decades now. When I was inducted as a fellow into the American Pharmacists Association, he was there – he led that trail. He taught me that you don't have to let skin color stop you. Doc made his mark on me, the field, and UCSF. He embodies this place.





Robert Gibson and Sharon
Youmans, photographed
at UCSF's Toland Hall,
February 21, 2014.

TEJAL DESAI, PhD '98; vice chair and professor, Department of Bioengineering and Therapeutic Sciences, UCSF; winner, Paul Dawson Biotechnology Award, American Association of Colleges of Pharmacy; recipient, UCSF Dean's Citation for Excellence in Teaching; winner, Eurand Pharmaceuticals Grand Prize for Innovative Approaches to Drug Delivery

ADAM MENDELSON, PhD '11; co-founder, president, and CEO, Nano Precision Medical, Emeryville, Calif.; former director, UCSF Venture Innovation Program; president, UCSF Graduate Division Alumni Association

MENDELSON: I remember meeting Tejal at an event to welcome new bioengineering students. She was remarkable in giving this impression of relaxation, while other professors seemed more stressed. Her work fascinated me. Lots of people wanted to work in her lab, so I had to be persistent.

DESAI: Honestly, I didn't know if Adam was going to be a good fit for the lab. But he just kept showing up at our meetings every single week. He would send me emails about what he wanted to work on – the ideas were all over the place. Ultimately, I realized that Adam is so bright that it didn't really matter what he does, he would make it work. So I ended up asking him to join us.

MENDELSON: Before I came to UCSF, I worked for companies in the diabetes field. The research Tejal did for her PhD was also in diabetes. My work in her lab was basically a continuation of her PhD project – to develop a device to deliver insulin using a hybrid of artificial and biological tissues. I was thinking about it as product development. That's my background, and it was where I wanted to go.

DESAI: I could see that Adam had this vision of creating a device that helps patients. But it's a long road from here to there, with many mundane experiments along the way.

MENDELSON: Time and again, I asked her whether or not it made sense to try something with the project, and she said, "Yeah, go for it." So I did, and it wouldn't work. Then I'd let her know it hadn't worked, and she would tell me why. She knew that my work would be better and more efficient if I figured it out for myself.

DESAI: You can't mentor everybody in the same way; Adam taught me that. I could have told him, "Okay, you do this and this, and we'll make sure you finish your PhD." But I wanted him to find that moment where he understood why it was important to do the painstaking experimentation. And he did. He suddenly just dove in.

MENDELSON: We founded our company right after graduation. Well, it kind of started before we finished. We won a UC Berkeley business plan competition, then another international competition at the Hong Kong University of Science and Technology. We got a second place at a competition in Boston. We had all the work done – the pitch, the plan.

DESAI: Adam and his co-founders were learning how to start a company with stent technology we developed in the lab. They brought it forward, all the way out of our lab. I was peripherally involved. It was actually very, very good for me to learn that process.

MENDELSON: Tejal taught me a lot about how to think about science and how to manage scientists. The effort she put into finding people who would collaborate well together – that's the kind of environment I have tried to replicate at my company.

DESAI: This is quintessential Adam – a master collaborator who always sees the big picture. One day he told me that he could introduce me to some of his industry contacts to develop a technology we were working on. Three phone calls later, we had what would

become a five-year partnership and a new project. So sometimes I wonder if Adam thought of me as a mentor. I actually learned a lot from him while he was in my lab.



Adam Mendelsohn and Tejal Desai, photographed at Nano Precision Medical in Emeryville, March 7, 2014.

Landmark \$100 Million Gift to Strengthen Children's Health Care

Children and parents on both sides of the San Francisco Bay have much to be thankful for: UC San Francisco recently received a transformative \$100 million gift from Lynne and Marc Benioff for UCSF Benioff Children's Hospital and its affiliate, Children's Hospital & Research Center Oakland. The gift will strengthen the existing talent and programs in basic and clinical research and patient care at the two premier institutions, as well as attract new expertise, to accelerate the development of innovative solutions for children's health on a local, national, and global scale.

In recognition of the two hospitals' affiliation on January 1, 2014, Children's Hospital Oakland is now named UCSF Benioff Children's Hospital Oakland, and UCSF Benioff Children's Hospital is named UCSF Benioff Children's Hospital San Francisco. Together, the hospitals are now known as UCSF Benioff Children's Hospitals.

"We have been deeply inspired by the incredible kids, doctors, researchers, and administrators at both UCSF and Children's Hospital Oakland," say Lynne and Marc Benioff. "We feel extremely fortunate to have this opportunity to support the best children's hospitals in the world."

Combined, the two hospitals are now the largest children's medical provider in Northern California, covering an estimated 500,000 young people, with more than 800 pediatricians and pediatric specialists at 23 different locations. And when the new UCSF Benioff

Children's Hospital San Francisco opens in Mission Bay in 2015, the pair will become one of the top 10 largest children's health care providers in the nation.

This is the second extraordinary gift of \$100 million from Lynne and Marc Benioff to UCSF.

"Private support is essential for UC to deliver the highest quality care, training, and research innovations needed to advance children's health," says Janet Napolitano, president of the University of California. "I thank the Benioffs for their generous support of UCSF and their commitment to our shared mission of building healthy communities."

UCSF Benioff Children's Hospitals are two leading Bay Area children's hospitals with longstanding commitments to public service. Both institutions, as well as UCSF Medical Center, care for all children who seek help, regardless of their family's ability to pay, and provide millions of dollars of uncompensated care and community services for low-income, homeless, and underinsured patients. From offering free children's health screenings to staffing clinics, the hospitals help meet the needs of Northern California's most vulnerable populations.

"The generosity and commitment of Marc and Lynne Benioff will strengthen Oakland's thriving medical research community and ensure doctors on both sides of the Bay have world-class facilities to care for children, regardless of income," says California Gov. Edmund G. Brown Jr.

PHOTO: INDIY CHEW



Gordon and Betty Moore Donate \$50 Million for Women's Health

Longtime UC San Francisco supporters and Bay Area residents Gordon and Betty Moore have donated \$50 million to the University to help fund the region's first women's hospital and to advance the innovative initiatives of the UCSF National Center of Excellence in Women's Health.

The gift is a private donation from the Moores, whose leadership and philanthropy have profoundly influenced health care practices in the United States. In recognition of the Moores' outstanding generosity, UCSF will name its new women's hospital the UCSF Betty Irene Moore Women's Hospital.

"It is a privilege to have the Moore name associated with our women's hospital. Betty is an icon, and her long-standing work as a patient advocate is inspiring," says Mark Laret, CEO of UCSF Medical Center and UCSF Benioff Children's Hospitals. "The Moores are national leaders in improving the quality and safety of health care, and we are thrilled to partner with them as we work to better the lives of our patients at the UCSF Betty Irene Moore Women's Hospital."

Gordon Moore is a co-founder of Intel Corp., and Betty Moore is a patient-safety pioneer. In 2000, they established the Gordon and Betty Moore Foundation to support progress in science, nursing, and patient care, as well as environmental conservation.

By bringing attention to such issues as medication safety, central line-associated bloodstream infections, and ICU care, the Moore Foundation has helped patients avoid hundreds of thousands of hospital days, has improved patients' hospitalization experiences, and has saved lives. And, thanks in large part to continued support from the Moore Foundation, UCSF has established itself as a national leader in patient safety and satisfaction.

The women's specialty hospital will be part of the new UCSF Medical Center at Mission Bay, a 289-bed state-of-the-art complex that will also include Benioff Children's Hospital San Francisco (see story, left) and Bakar Cancer Hospital. The complex will open in February 2015.

Alumni Hub

ONLY
UCSF
150YRS

JOIN UCSF IN MARKING 150 YEARS

We look forward to celebrating UCSF's sesquicentennial with you! The festivities kicked off in April and will conclude with Alumni Weekend next year: May 28-30, 2015. To view a calendar of events, visit ucsf.edu/150.

Since its founding in 1864, UCSF has educated and trained thousands of remarkable men and women who – as alumni – have helped define our legacy of excellence. In the pages that follow, you will read about a few stellar UCSF graduates whose contributions to health are ensuring that UCSF's next 150 years are as impressive as its first. →

PHOTO: UCSF ARCHIVES & SPECIAL COLLECTIONS

SCHOOL OF DENTISTRY

**LAJUAN HALL, DDS '94,
RESIDENT ALUMNA****Hometown:** Los Angeles**Now:** Brentwood, Calif.**Position:** Pediatric dentist, owner of Brentwood Children's Dentistry**Hobby:** Making and selling olive oil through a local growers' cooperative

FINDING DIRECTION: I decided to become a dentist at a very young age. I've always loved teeth, for some reason.... I was even voted "Best Smile" in high school. I started my practice 20 years ago. Now I have a staff of 12, including three doctors, and over 3,000 patients. It has grown to be a big practice, but we treat all patients as we would treat members of our own families. The thing I enjoy most as a pediatric dentist is connecting with the families and watching the kids grow up from the time they're toddlers to when they're in high school.

My secret weapon is singing. I'm not a great singer, but I love my karaoke. We sing to the patients. My favorite song is "Herman the Worm," and I often sing Barney songs.

SWITCHING GEARS: Dentistry is my second career. I majored as an undergraduate in biology, with a second major in broadcast

journalism. My first job was in TV game shows. I worked for Chuck Barris, coordinating contestants for the taping of *The Newlywed Game* and *The Dating Game* back in the 1980s. It was a lot of fun, but not what my mom and dad sent me to college for. I did it for a few years because I just needed a little break.

"I'M JUST GRATEFUL": At UCSF, my research was in dental lasers. I was really involved in leadership in school, as student body president. I thought about going into academia initially – or opening a general practice. Dr. Ray Braham, who is still there, asked if I was interested in pediatrics, and I wasn't considering it. But then I thought, "You know what? Sure...." I ended up staying seven years. The residency

opened my eyes to a great specialty, and I immediately found my passion. I'm just grateful to be a UCSF alum.

GIVING BACK: I currently serve on the Dean's Council, raising money for the school. I've been contacting classmates throughout the year through the alumni association. We held a multi-school reception in Danville a couple of months ago and several other regional receptions. It is wonderful for classmates to reconnect. It's an especially important year for me: my class marks our 20th reunion!

And it will be held on my wedding anniversary, May 30! (Hall is married to retired dentist Michael Schneider, DDS, who helped start the Brentwood practice; they have two grown children.)

97% OF

SURVEYED PATIENTS OF THE UCSF STUDENT DENTAL CLINIC WOULD RECOMMEND THE CLINIC TO FRIENDS AND FAMILY

#1 IN NIH FUNDING

AMONG DENTAL SCHOOLS SINCE 1992

99% OF STUDENTS PASSED

WESTERN REGIONAL EXAMINING BOARDS:
HIGHEST RATE AMONG CALIF DENTAL SCHOOLS

**ROBERT JONES, DDS '03,
PhD '06, RESIDENT ALUMNUS**

Hometown: Moraga, Calif.

Now: Saint Paul, Minn.

Position: Assistant professor, Division of Pediatric Dentistry, University of Minnesota

Hobbies: Biking, ice-skating with his family



Back when he was a 20-something short-story writer, Robert Jones aspired to a day job that would give him time to work on his fiction. “I thought dentistry would be a good fit,” he says. “I thought I could work four days a week and still write.”

WRITER-TURNED-RESEARCHER:

While he was at UCSF, Jones made the jump to dental research – which led him to specialize in optical imaging. He studies the

bacteria that lurk underneath children’s fillings – a reason some dental restorations fail early. “You can image under them and find out what’s going on,” Jones explains. “If a patient is having an early failure of a restoration, we’re able to study the dental plaque associated with the condition we detect.”

MINNESOTA LIVING: Jones relocated his family from California to St. Paul in 2009 to join the

faculty at the University of Minnesota. The father of two young children, with a third on the way this summer, Jones has put his fiction writing on hold for now, focusing instead on turning out grant applications and research papers. His wife, Natalie (Nabby) Jones, DDS '04, is also a dentist. They met as undergraduates at UC San Diego and then both moved on to graduate school at UCSF. After earning his

DDS and PhD, Jones completed a residency in pediatric dentistry in 2009. Natalie is now a part-time clinical faculty member at the University of Minnesota.

“I can’t say enough about the training I got at UCSF,” Jones says. And, yes, his kids indulge in occasional sweets. “You have to live,” he jokes. “You can’t deprive your kids.”



FROM THE ARCHIVES

UCSF Mobile Dental Clinic, 1974. Faculty from the School of Dentistry began reaching out to the community with mobile clinics in 1965.

SCHOOL OF MEDICINE

ON BEING MISS CALIFORNIA:

It definitely was a fluke. I'd never entered a pageant before in my life. I'd never even worn makeup or high heels. I was a premedical student in my senior year at Stanford. My sister found a flier on campus. She called and entered me in the pageant, unbeknownst to me. I competed and ended up winning.

“YOU DON'T DEFER”: After winning Miss California, you don't go home after being selected, as training begins immediately for the Miss America Pageant. My big concern was what would UCSF say. You typically don't defer. I'd always wanted to be a doctor. If UCSF hadn't allowed me to delay, I would have gone to medical school – there's no doubt in my mind. But my year as Miss California made me a better physician, a better person. It exposed me to a world I'd never seen before – impoverished areas throughout the world.

“A FORCE OF NATURE”:

My UCSF professor Nora Goldschlager is the reason I'm in cardiology. She's a force of nature. She was my attending the last month of internship year. I had always been frightened of cardiology, as there were very urgent cases with incredibly sick patients, where life-or-death decisions needed to be made. I remember telling her, “This is amazing. I wish I could do it.” She said, “Of course you can do it.”

DATING GAME: My husband [former Lieutenant Commander Carson Taylor Lawall, MD '05] ignored me in med school, but he claims otherwise. We started dating when I was in Los Angeles at



RITA NG, MD '05, RESIDENT ALUMNA

Hometown: Tracy, Calif.

Now: Montclair, Calif.

Position: Cardiologist at Kaiser Permanente, rotating between the Oakland and Richmond sites

Hobbies: Piano, hiking

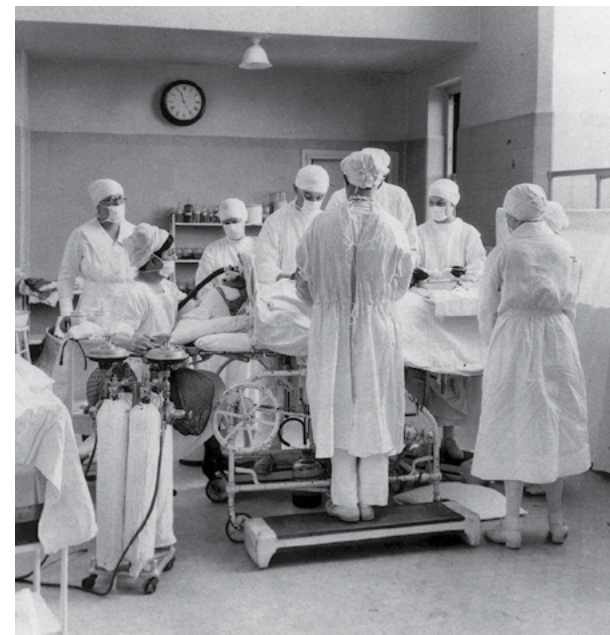
the Cedars-Sinai Heart Institute, and he was stationed at the Naval Medical Hospital in San Diego. [Then] he went to Afghanistan for a year. It was tough; he's a neurologist and saw a lot of patients with traumatic brain injuries. Carson proposed in San Francisco after returning home, and I married the love of my life last year in a beautiful multicultural ceremony, with a military honor guard and a traditional Chinese banquet.

MENTORING UCSF STUDENTS:

UCSF medical students now rotate with me in my clinic. I get to teach and give back to all my professors. I feel so lucky. I've been given so many opportunities in my life. I owe so much to UCSF. I really do. It's just such a remarkable place, and I feel so well trained.

FROM THE ARCHIVES

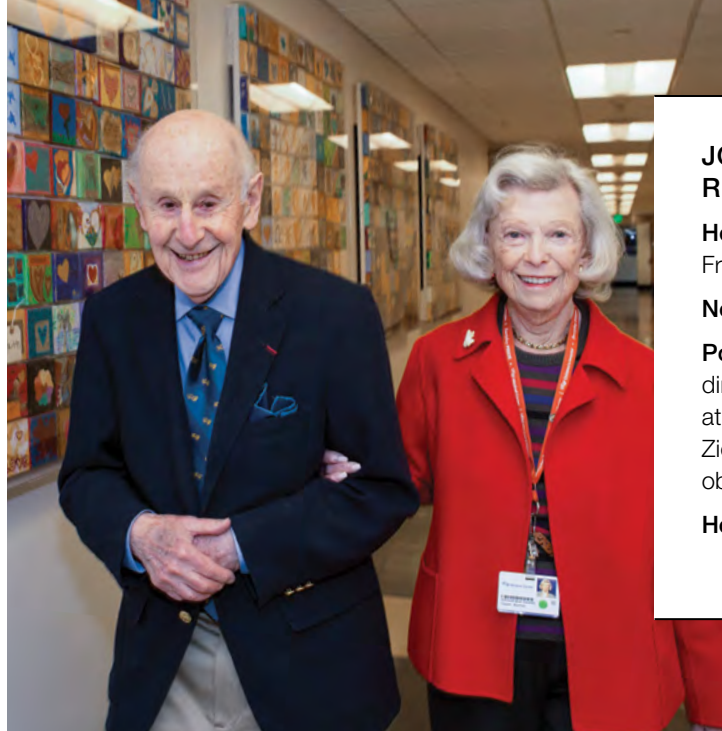
UC Hospital operating room, 1924. Designed by leading Bay Area architect Lewis Parsons Hobart, the 225-bed hospital opened in 1917.



Decorated World War II veteran John Kerner says his life can be divided into three stages: as a wartime medic, as a doctor, and as a writer.

Kerner landed on Omaha Beach in 1944, shortly after D-Day. For 264 days, the young army medic treated and transported injured soldiers during brutal fighting across France, Belgium, Luxembourg, and Germany. “General Patton thought we had a wonderful division,” Kerner recalls. “We were always in front and had a lot of casualties.” For his bravery in the fight to liberate France from the Nazis, Kerner was one of seven US veterans awarded the French Legion of Honor medal in 2007 by President Nicolas Sarkozy of France. He was also inducted into the 35th Division Hall of Fame in 2012.

Kerner, now 95, devoted his 40-year career to advancing and humanizing women’s health care. That interest began when UCSF



Professor Herbert Traut, MD, sent his young intern to Harvard to observe how doctors there handled childbirth. The Harvard physicians were giving women a combination of morphine and another drug, scopolomine, to cope with labor, Kerner recalls. “We rebelled against that,” he says. “We used less pain medicine. We gave nitrous oxide to inhale in the later stages of labor.”

He went on to explore natural childbirth options, hiring midwives and inviting husbands into the delivery room. He also created a homier hospital environment, with comfortable beds and home-like furniture.

Kerner and Traut also urged pathologists to use Pap smears instead of biopsies to detect established, early, and pre-cancer. “It was hard to convince people that it would work,” he says. “It saved thousands of lives.”

After Kerner retired, 15 years ago, he was cleaning out his office and found boxes of letters he’d written to his mother and sister during the war. “One day a patient who was an author said, ‘John you should do something with those letters,’” he says. With the help of a writing class and a few mentors, he went on to complete two memoirs, *A Combat Medic* and *A Combat Medic Comes Home*.

SEEKING A CURE: A longtime UCSF donor, Kerner established the Kerner Cancer Research and Education Fund to support

JOHN KERNER, MD '43, RESIDENT ALUMNUS

Hometowns: Boston and San Francisco

Now: San Francisco

Position: Retired chief of staff and director of obstetrics and gynecology at UCSF Medical Center at Mount Zion, and retired clinical professor of obstetrics and gynecology at UCSF

Hobbies: Writing, golf, entrepreneurship

gynecologic cancer research and care. In addition, working with UCSF’s cancer center, he raised money to finance phase 1 and phase 2 trials of a drug called TT-100, which has shown promise against non-small cell lung cancer. After finishing the phase 2 trial with good results, Kerner started a company called TriAct Therapeutics, which is developing TT-100 and two other drugs.

“The people at the university said, ‘John, you can’t raise the kind of money you need from your friends,’” he says. “‘You have to form a company.’ I said, ‘You expect me to form a company at 90?’” But that’s exactly what he did. The company is now working toward raising the \$35 million required to further test the drug.

LIFE WITH GWENDOLYN: After Kerner returned home from the war, he met the woman who is now his wife, Gwendolyn – “a Phi Beta Kappa Stanford grad who danced like a dream.” They married and settled in San Francisco, where they raised three children. Gwendolyn still works as a receptionist at the UCSF Helen Diller Family Comprehensive Cancer Center. They celebrated their 67th anniversary last year.

5 NOBEL LAUREATES

THE ONLY MEDICAL SCHOOL RANKED IN TOP 5 IN BOTH RESEARCH AND PRIMARY CARE BY *U.S. NEWS & WORLD REPORT*

#1 IN NIH FUNDING AMONG MEDICAL SCHOOLS

SCHOOL OF NURSING

**JENNIE CHIN HANSEN,
MS '71, RN****Hometown:** Boston**Now:** New York City**Position:** CEO of the American Geriatrics Society and past president of the AARP**Hobbies:** Reading American history, collecting orchids, traveling

A few years after Jennie Chin Hansen graduated from UCSF, she took a job as a research assistant at On Lok, a small community health organization serving seniors in San Francisco's Chinatown.

A dozen years later, she was named CEO of the nonprofit, after having advanced a number of innovative initiatives. One example was the Program of All-Inclusive Care for the Elderly (PACE), which integrates social and medical services for vulnerable elders. In 2004, she moved her advocacy for older adults onto the national stage, becoming the first nurse in 25 years, the first baby boomer, and the first Asian American to serve as president of the AARP (formerly the American Association of Retired Persons).

Now CEO of the American Geriatrics Society, Hansen also completed a six-year term in 2011 as a member of the federal Medicare Payment Advisory Commission.

ON CHANGING DIRECTION:

When I came to UCSF from the East Coast, it was such a contrast. There was so much more flexibility and creativity allowed at UCSF... I actually found that I didn't like hospitals when I was in training. I rebelled against the conventions at that time and went into community health and public health systems. Over time I fell into the focus of geriatrics and diverse communities.

MEET THE PRESIDENT: I had a phenomenal advocacy career at AARP. My two years as president of the 38-million-

member organization were during the heart of the debate over the Affordable Care Act and health care reform. I traveled throughout the country and had a chance to host an electronic Town Hall with our members, along with the actual presence of President Obama.

FIGHTING FOR UNIVERSAL HEALTH CARE:

The year before I became president of AARP, the whole health care world was in great turmoil about access, affordability, and maintaining health. That's the work I did for 25 years at On Lok, but for a more complex, frail population. We know that [great universal health care] is possible – especially as we compare ourselves to the results achieved by other developed countries that don't spend as much as we do.

MULTIGENERATIONAL CONNECTIONS:

My son, Erik Hansen, [MD '05], an orthopedic surgeon, is now on the UCSF faculty. I met his father, [the late Christopher Hansen, who was in the microbiology PhD program at UCSF], on the first day of our graduate registration at UCSF. Rather amazingly, our son ended up having his white coat ceremony in that same room where his father and I met 30 years earlier.



ARIELLE BIVAS, MS '14

Hometown: Palo Alto, Calif.

Now: San Francisco

Position: Third-year student in the UCSF Master's Entry Program in Nursing

Hobbies: Cooking, spending time at the beach, exercising

For Arielle Bivas, the transition from visual artist to nurse began with science courses – mixed with a healthy dose of fear.

“I was terrified when I started,” says Bivas, who entered the Master’s Entry Program in Nursing in 2011. “A lot of people doubted I could go from art to something more science-based.”

Four scholarships that she received from UCSF helped to ease her transition into the field.

Bivas, who graduates this year, was the first recipient of the Betty H. Gabriel Chancellor’s Endowed Scholarship, which was created by two gifts: one from Herbert Gabriel, DDS '43, in memory of his wife, Betty, a BS '43 nursing alumna of UCSF, and the other from former UCSF Chancellor Susan Desmond-Hellmann, MD, MPH, resident alumna, and her husband, Nicholas Hellmann, MD, resident alumnus. “I met Herbert Gabriel last year and was very touched by his story

and by meeting him,” says Bivas, who is completing her clinical rotation at Glide Health Services in San Francisco’s Tenderloin district. “I hope that someday I’ll be able to give back and help a student in the same way.”

A CLOSE-KNIT GROUP: Bivas says her class is an “amazing,” diverse group. “People work so hard to get to UCSF and make a change in their lives and careers,” she says. “It’s a close-knit group. Everyone is very

supportive and understanding.” Bivas has already completed the MS Program in the Adult-Gerontology Primary Care Nurse Practitioner specialty, with a minor in diabetes. The School of Nursing launched the minor in 2012, thanks to a \$1.5 million anonymous gift.

LEADING THE WAY: As president of the Nursing Student Council for the past two years, Bivas is currently celebrating “a huge victory,” having brought all UCSF students – from the schools of dentistry, medicine, nursing, and pharmacy – under a unified student government umbrella. The four schools previously had distinct student programming but will now work together on everything from social events to student advocacy and communications with faculty to scheduling of speakers. “It made sense for us to all come together,” Bivas says.

#1 IN NIH FUNDING AMONG NURSING SCHOOLS

CONSISTENTLY RANKED AMONG TOP GRADUATE NURSING SCHOOLS BY U.S. NEWS & WORLD REPORT

13 DIFFERENT SPECIALTY AREAS



FROM THE ARCHIVES

Nursing students in Toland Hall, 1941. The school was founded in 1907 as the University of California Training School for Nurses.

SCHOOL OF PHARMACY

At age 16, William E. Smith took a job working at Munson's Drug Store, a one-man pharmacy in Alhambra, to earn money for his family. That high school job set him on a lifelong career path.

But the path didn't come into focus until he was a UCSF pharmacy student. That was when Smith veered away from the idea of running a community pharmacy toward the emerging field of hospital-based clinical pharmacy practice.

CLINICAL PHARMACY TRAILBLAZER: Smith went on to become a clinical pharmacy pioneer, serving as the first pharmacy coordinator for the Ninth Floor Pharmaceutical Service Project, a joint effort between the School of Pharmacy and UCSF's Moffitt Hospital. "The Ninth Floor Project was the real beginning" of clinical pharmacy in the United States, Smith explains.

He began work on the Ninth Floor Project, a satellite pharmacy located on Moffitt's general surgical floor, after completing his residency in 1965. He spent hours discussing the progressive ideas behind the project with pharmacy faculty of the time, including Vincent Gardiner, Donald Brodie, and Erick Owyang; among those ideas were asking patients during their admission interviews to list any drugs they were taking, in an effort to prevent later drug interaction problems.

The Ninth Floor model served as a proving ground for locating a clinical pharmacy practice inside a hospital, where it had traditionally been nurses who distributed

drugs to patients. In addition to recording patient drug histories, pharmacists involved with the project conducted patient rounds, answered drug information questions, recommended medication doses, and participated in patient care conferences.

ADVANCING THE FIELD: After spending two years with the Ninth Floor Project, Smith moved on to direct pharmacy services for 23 years at Long Beach Memorial Medical Center, earning a master's degree in public health at UCLA while there. At Long Beach Memorial, a 500-bed community hospital, Smith built out the clinical pharmacy model using what he'd learned on the Ninth Floor Project.

Upon earning his PhD from Auburn University in 1994, Smith shifted to academia – teaching pharmacy management first at Northeastern University's Bouvé College of Health Sciences, where he became department chair, and later at Virginia Commonwealth University's Medical College of Virginia School of Pharmacy, where he also served as executive associate dean. He also held faculty positions at various times at the University of Southern California School of Pharmacy and UCSF.

BIG IMPACT: UCSF's pharmacy residency, which recently marked 50 years, is one of the longest-standing such residencies in the country. (Smith

was among the program's first graduates and was the School of Pharmacy's Alumnus of the Year in 1980.) In the decades since he left San Francisco, Smith has received his industry's top accolades, including, in 1982, the Harvey A.K. Whitney Award, given for "outstanding contributions to health-system pharmacy." It is considered hospital pharmacy's highest honor.

After holding faculty positions at four schools of pharmacy, Smith retired in Virginia in 2011. He says he's continuing to stay on top of clinical pharmacy developments, while spending more time with his wife and family, including four grandchildren.

WILLIAM E. SMITH,
PharmD '64,
RESIDENT ALUMNUS,
MPH, PhD

Hometown: Alhambra, Calif.

Now: Midlothian, Va.

Position: Retired professor and former director of pharmacy services at Long Beach Memorial Medical Center

Hobbies: Coaching fast-pitch softball, studying Colonial history



Barry Quart could have retired in 2012 when he sold the company he co-founded, Ardea Biosciences, to pharmaceutical giant AstraZeneca. He had no interest in doing so. “I get bored easily,” says Quart, whose latest challenge is as turnaround CEO of Heron Therapeutics, which is developing drugs to treat chemotherapy-induced nausea and postsurgical pain.

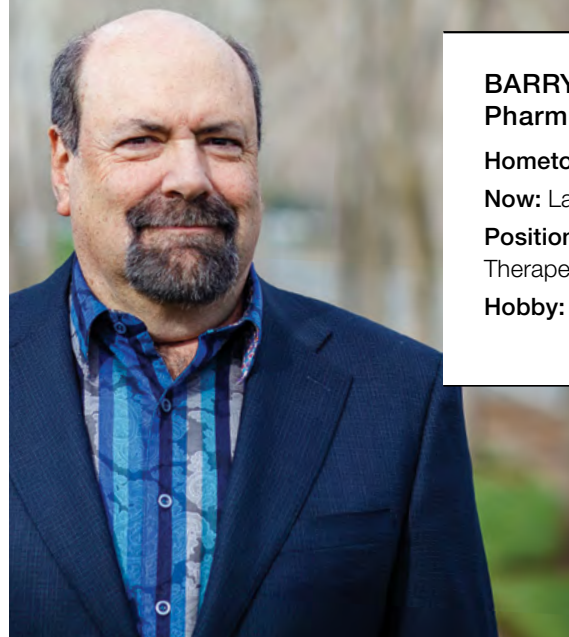
SPURRING DRUG DISCOVERIES:

Quart’s three-decade career includes spearheading important drug discoveries against both HIV and cancer. His CV includes stints at major pharmaceutical companies like Bristol-Meyers Squibb, where he worked for more than 10 years in clinical research and regulatory affairs, as well as at small biotechnology companies like Agouron Pharmaceuticals.

At Agouron, in 1993, he helped develop Viracept, a drug that

prevents HIV from replicating. It went from the lab to FDA approval in a speedy 38 months. “At the time, there was a lot of pressure on FDA to move quickly,” Quart notes. “Protease inhibitors were key to the three-drug cocktail that changed HIV from a fatal disease to a chronic disease that no one should die from.” Agouron was later acquired by Warner-Lambert for \$2.1 billion.

UCSF MINDSET: Quart credits his UCSF professors with teaching him the critical-thinking skills that lead to groundbreaking discoveries. “They focused on questioning what you’re seeing and being extremely thoughtful in coming up with analysis and decisions,” he says. At Ardea Biosciences, these skills helped him see what others may have missed: that uric acid levels dropped in participants in a clinical trial of a new HIV drug, after they took the drug.



BARRY QUART,
PharmD '82

Hometown: Los Angeles

Now: Las Vegas

Position: CEO of Heron Therapeutics

Hobby: Producing films

Quart knew that meant part of the drug could be used to treat gout, a disease on the rise in the United States as sugar consumption has jumped. “You drink a couple of Cokes and increase your uric acid levels,” he says. “This drug lowers uric acid, which in turn reduces gout.” This serendipitous discovery led to the company’s 2012 acquisition by AstraZeneca.

MAKING MOVIES: When he’s not developing drugs, Quart produces movies, as a “little hobby.” His most recent project, a teen comedy called *Behaving Badly* and starring Selena Gomez, is due out this summer.

“The dynamics of developing movies and drugs are remarkably similar,” he says. “You never know which project is going to make it.”

**RANKED THE TOP
PharmD PROGRAM
IN THE NATION BY
U.S. NEWS & WORLD REPORT**

**#1 IN NIH FUNDING AMONG
PHARMACY SCHOOLS SINCE 1979**

**PIONEER IN
CLINICAL PHARMACY**



FROM THE ARCHIVES

Pharmacists in the Moffitt Hospital pharmacy, 1959. Several years later, the School of Pharmacy would launch the first clinical pharmacy program in the country.

GRADUATE DIVISION

ELIZABETH ROSE MAYEDA,
PhD '13, MPH

UCSF Graduate Program:
Epidemiology and Translational Science

Hometowns: Santa Cruz and Berkeley,
Calif.

Now: San Francisco

Position: Postdoctoral scholar

Hobby: Running (from 5Ks to marathons)



Growing up in tiny Aptos, Calif., tucked between the beach and the redwoods in Santa Cruz County, Elizabeth Rose Mayeda discovered a passion for epidemiology.

Her interest in the field was sparked by a high school statistics class. “I loved it,” she says, while taking a brief break from studying the determinants of cognitive decline and dementia. For Mayeda, a soft-spoken runner, making sense of numbers is a natural way to spend her days. As an undergraduate at UC Berkeley, she double-majored in biology and public health, growing more and more intrigued with applying her analytical skills to epidemiological questions. That interest brought her to UCSF, where she became the school’s first graduate last year of the University’s new PhD program in epidemiology and translational science.

IN ON THE GROUND FLOOR:

As one of just four students in a brand-new program at a high-caliber university, Mayeda had an opportunity to help shape

the format and content of her program’s doctoral seminar series and qualifying exam process. “The program leaders listened to feedback about the program structure

from the other early students and me,” she says. “It was rewarding to be able to contribute to the development of the program, and I really appreciated that the leadership valued our opinions.”

Another unusual aspect of the new program is that students aren’t required to formally defend their dissertations. Instead, Mayeda made a presentation at a departmental seminar about her doctoral research, which focused on the link between diabetes and the risk of dementia in older adults.

A LIFE OF RESEARCH: Hoping for a career doing research, Mayeda aspires to teach at a university and continue to study how various exposures over a lifetime affect an individual’s cognitive aging and risk of developing dementia. “It seems like tiny pieces of the puzzle are starting to come together,” she says, adding, “There’s still a lot to understand about the brain.”

PIONEERING
INTERDISCIPLINARY PROGRAMS AND
AWARD-WINNING FACULTY

**1,600 DOCTORAL AND
MASTER’S STUDENTS AND 1,100
POSTDOCTORAL SCHOLARS**

FIRM COMMITMENT
TO INNOVATIVE CAREER-DEVELOPMENT
& DIVERSITY PROGRAMS





MICHAEL MARLETTA, PhD '78

UCSF Graduate Program:

Pharmaceutical Chemistry

Hometown: Rochester, N.Y.

Now: La Jolla, Calif.

Position: President and CEO, Scripps Research Institute

Hobbies: Cooking, wine

Michael Marletta's father quashed his request for a chemistry set, afraid his young son would blow up the house. So Marletta ordered a few chemicals from the pharmacy and mixed them up in the basement. While his irrepressible curiosity got him in trouble, it also sparked a remarkable career exploring the intersection of chemistry and biology.

FROM THE ARCHIVES

Laboratory of Experimental Oncology, 1950s. The Graduate Division, which was established in 1961, today oversees PhDs and postdocs who conduct cancer research in labs all across UCSF.

As a UCSF doctoral student, working in the lab of George Kenyon, PhD, Marletta pursued a growing fascination with enzymes. His research accelerated during stints on the faculty at the Massachusetts Institute of Technology, the University of Michigan, and UC Berkeley, where he chaired the chemistry department. Along the way, he made a pioneering discovery regarding the role of nitric oxide – a critical player in communication among cells – and received a MacArthur Foundation Fellowship, a prize popularly referred to as a “genius grant.” His contributions have also earned him top scientific accolades, including election to the Institute of Medicine, the American Academy of Arts and Sciences, and the National Academy of Sciences. In 2012, he assumed the presidency of the Scripps Research Institute.

BIOLOGY BUZZ: I majored in chemistry [in college] and thought

biology was a waste of time. I took a required biology course during the summer to get it out of the way. It was taught from a very physical perspective, and I realized biology was a much better chemist than humans would ever be.

UCSF KNOCKS: [While looking for graduate programs], I found chemistry departments paying lip service to biology, and biochemistry departments that didn't seem chemical enough. My undergrad research mentor, Jerry Supple, met a new faculty member in the pharmaceutical chemistry department at UCSF, Neal Castagnoli. Castagnoli wrote me a two-and-a-half-page letter, telling me why UCSF would be a good place for me. I didn't get too many letters from faculty at big research universities, so I applied!

ACADEMIC MAVERICKS: The department was way ahead of the curve in mixing people who

were thinking about biology from a chemical perspective with chemists. Tom James, Peter Kollman, George Kenyon, and Tack Kuntz had recently joined [the faculty]. The students were also different – they were primarily grounded in organic chemistry but interested in biology. It was an exciting time.

PROFESSORIAL PATH: The biotech industry was just taking root [when I graduated]. But I had always wanted a career in academia. There are two reasons: I never liked having a boss, and it's where you could do research and pursue whatever you were interested in.

LEADING SCIENTISTS AND SCRIPPS: We want faculty who are smart and fiercely independent, because doing science is a tough business – as tough as it's ever been.... I enjoy the challenge of getting a large group of researchers to come together through a common vision. I also spend a lot of time talking to people who aren't scientists about what we do. It's more important than ever to convince the public, in the face of diminishing federal resources, how important those resources are for ultimately delivering the highest quality health care in the United States.



Kate Varandas and
Mark Von Zastrow

Investing in Young Scientists

The UCSF Discovery Fellows Program

Discovery Fellow Kate Varandas is passionate about research. A fourth-year PhD student, Varandas works weekdays and oftentimes weekends on UC San Francisco's Mission Bay campus in the laboratory of Mark Von Zastrow, MD, PhD. Under Von Zastrow's expert guidance, Varandas is tackling big problems such as drug abuse and addiction from a cellular and biological perspective. In particular, she's investigating the effects of pharmacological and physiological stimuli on cell signaling mechanisms.

"We know that certain drugs, as well as natural substances, can affect behaviors or alter the course of a disease," explains Varandas. "But often we don't understand exactly how or why they work in the way they do – at least not at the cellular level."

Varandas is one of hundreds of PhD students at UCSF bent on unraveling complex biological systems that may hold keys to some of human health's greatest challenges. With the freedom to work in multiple labs and across disciplines, graduate students often drive the direction of research and help to bring about scientific breakthroughs.

The \$60 million UCSF Discovery Fellows Program – launched at the end of 2013 with a generous \$30 million commitment from venture capitalist Sir Michael Moritz and his wife, Harriet Heyman – recognizes this pivotal role graduate students play in fueling the biomedical sciences. Part of the program's inaugural cohort, Varandas was named a Moritz-Heyman Discovery Fellow in January. Students were selected for their excellence in leadership, research, community-mindedness, and communications skills. Other named Discovery Fellows will follow as additional leadership donors step forward.

As student-ambassadors for basic science research, the Discovery Fellows will be invited to speak at Graduate Division/Discovery Program events. Varandas admits that explaining her research to nonscientists can be a challenge, but it's one she feels motivated to pursue.

"If we can't communicate the ideas behind our research, we won't get papers published widely or receive the funding that we need," she says.

Varandas is excited to hone her presentation skills through training that will be offered to Discovery Fellows. Students will also receive financial support – \$2,000 annually during their third, fourth, and fifth years – for professional development and research-related expenses.

In the face of an increasingly constricted funding environment, the Discovery Fellows Program is an idea whose time has come. It is the largest endowed program for PhD students in the history of the 10-campus University of California system. Remarkably, all 20 chairs of UCSF's clinical departments have supported the effort; their donations total more than \$1.5 million – an extraordinary show of solidarity from the clinical side of the University and a demonstration of the initiative's importance to the entire UCSF community.

"The Discovery Fellows Program raises the profile of graduate education," says Elizabeth Watkins, PhD, dean of UCSF's Graduate Division and vice chancellor of Student Academic Affairs. "Not only that, we hope it will instill a new culture of philanthropy in graduate education, which will expand our endowment. Our graduate students have the potential to transform health at a fundamental level. What more can we ask of our young scientists?"

UCSF Discovery Fellows Program

A \$60 million endowment made possible by:

- A \$25 million outright gift from **Moritz and Heyman**
- A \$25 million match from **UCSF** institutional funds
- An additional \$5 million from the **Moritz-Heyman Challenge** if UCSF raises \$5 million from **at least 500 donors** by December 31, 2015

To donate to the program, please use the attached envelope or visit: makeagift.ucsf.edu/discoveryfellows



Elizabeth Rogers and Kabibe

San Francisco Zoo, 2013

Examining the 2½-month-old gorilla nuzzling her hands, UCSF neonatologist Elizabeth Rogers, MD (above, right), confessed to a *San Francisco Chronicle* reporter, “She’s actually a little more advanced than my own 5-month-old.”

Gorilla births in captivity are rare – there are only about six a year nationwide – so the San Francisco Zoo asked Rogers to consult on little Kabibe’s arrival last summer. Obstetricians from UCSF Benioff Children’s Hospital San Francisco were also on call, just in case the mother, Nneka,

needed a cesarean section. Kabibe, which means “little lady” in Swahili, was born in the gorilla enclosure, in front of some lucky cellphone-carrying zoo visitors.

Rogers, a resident alumna, and her colleagues have been working with zookeepers ever since, advising them on such matters as formula, developmental milestones, and signs of infection.

Kabibe is one of only 750 western lowland gorillas in captivity. There are thought to be as many as 100,000 living in the wild in central Africa.

INSIDE:

Scientists explore a trove of healing
– the human microbiome.

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Mavericks and milestones: UC San Francisco
celebrates 150 years of advancing health.

PAGE 16

A new spin on caring for older adults.

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