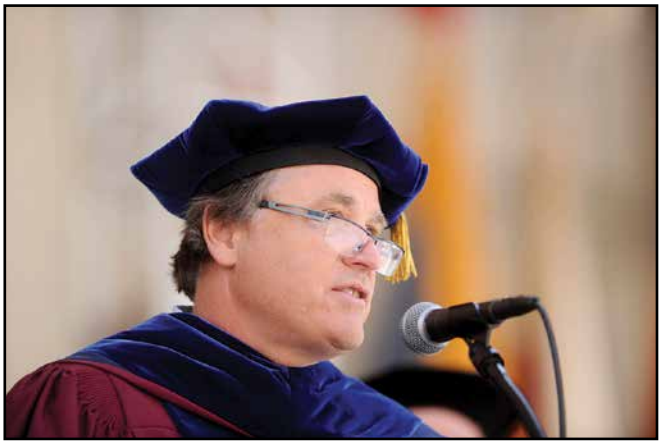
2013

Berkeley BioE

Message from the Chair

Dear Friends of Berkeley Bioengineering,



It has been another exciting year for bioengineering at UC Berkeley. After fifteen years our department continues to grow and change, and we could not be more excited about our upward trajectory.

The dedication and enthusiasm of our faculty is a major part of this success. They accomplish impactful research by focusing on translational medicine and leading the field in synthetic and systems biology, enhancing our reputation and making a real difference in health technologies. The faculty also play key roles in several new bioengineering-focused research initiatives on the horizon for UC Berkeley.

We're innovating in education as well, and are pleased to welcome our first class of Master of Engineering students this fall, and our third cohort of Master of Translational Medicine students. Our commitment to teaching was recognized with bioengineering's first UC Berkeley Distinguished Teaching Award, presented to lecturer Terry Johnson. Our senior capstone design course, now entering its fifth year, is a smashing success in producing accomplished student engineers who have won design competitions and spawned newly-funded startup companies.

As always, our outstanding students attract attention and recognition, including Rhodes and Goldwater Scholarships, our first University Medal, an HHMI international fellowship, and a host of other honors. Finally, this year is also the 30th anniversary of our joint graduate program with UC San Francisco. Together we've trained almost 400 Ph.D.'s in bioengineering, who now hold leadership positions in academia, industry, and government around the world.

To continue our department's growth, this year we are recruiting a tenure-track faculty member in the broad area of cellular engineering and synthetic biology. Please direct any suitable applicants to our website for details.

We invite you to join in supporting and rejoicing in these accomplishments with us, made possible by the enthusiasm and excellence of our students and faculty. Go Bears!

BIOENGINEERING
UNIVERSITY of CALIFORNIA, BERKELEY

Department of Bioengineering
University of California, Berkeley
http://bioeng.berkeley.edu
bioeng@berkeley.edu
510-642-5833

Best wishes,

Jan Fandrianto Distinguished Professor and Chair
Department of Bioengineering
University of California, Berkeley

Undergraduate Program

Ranked one of the top ten undergraduate bioengineering programs in the country, the Berkeley curriculum ensures exposure to the breadth and depth of bioengineering subjects and provides a hands-on learning environment for students to apply their knowledge in an engineering approach to biological systems.

Our major features small, specialized upper-division courses and direct interaction with faculty. We offer six distinct concentrations: Biomaterials, Biomechanics, and Cell & Tissue Engineering; Biomedical Devices, Biomedical Imaging; Computational Bioengineering; Pre-med; and Synthetic Biology. Students benefit from intensive design projects through the senior capstone course and independent research opportunities in faculty laboratories.

The stimulating environment of Berkeley offers a wealth of opportunity for learning, research, service, and community involvement, and provides dedicated students the knowledge and skills to excel in graduate or medical school or a variety of industries.

New Master of Engineering Program

The Bioengineering Master of Engineering (MEng) degree is offered for the first time in the 2013-2014 academic year. This professional master's degree has a strong emphasis on engineering and entrepreneurship, designed for students planning to move directly into industry after completing the program. Graduates of this one-year program will have a combination of technical and economic understanding that will allow them to quickly assume leadership roles in their engineering careers.

Degree requirements include coursework in three areas: the core leadership curriculum, a technical specialty, and a capstone project.

The threefold approach to engineering education includes:

- Instruction in a broad set of management skills needed to lead technology enterprises and ventures, common to all students in the program.
- Deeper instruction in a technical area, chosen from19 concentrations in new and emerging technologies.
- A team capstone project, analyzing and addressing an industry challenge, designed to integrate the core curriculum with technical coursework.

Stanley Hall. Photo by Cindy Manly-Fields.
Cover: MTM graduate at commencement. Photo by Noah Berger.

The Master of Translational Medicine Program

Launched in 2010, the Master of Translation Medicine (MTM) program is a one-year professional master's degree designed to train students in applying translational research and engineering approaches to solve fundamental problems in healthcare delivery. Offered jointly by UC Berkeley and UC San Francisco, the MTM program develops future leaders in the business of rapidly moving technology from the lab to the clinic.

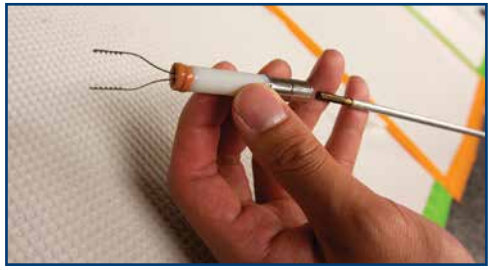
Each cohort of 15 to 30 students spends one year—August to June—taking courses in engineering, clinical research, finance, and business leadership, and working as part of a team on a capstone design project with a client from a hospital, company, or academia.

Two projects from our recent cohort are MagnaGrasp and HDL Nexus.

MagnaGrasp

Jerd Phichitkul, Sara Pittenger, and Matthew Swisher worked with Dr. Michael Harrison, Professor Emeritus of Surgery, Pediatrics, Obstetrics, Gynecology and Reproductive Sciences at UC San Francisco, on MagnaGrasp, an innovative, detachable, magnetically-operable tissue retractor device. Lack of space for tissue retraction has been a key factor limiting the adoption of single-incision laparoscopic surgery, a minimally-invasive technique in which the surgeon operates through a single entry point. The MagnaGrasp can grab any tissue and detach from the handle, leaving behind the grasper, with the level of retraction easily adjustable by an external magnet. The MTM team has completed a refined prototype grasper after benchtop testing, and plans to do more testing and analysis before initial manufacturing and preclinical study in a porcine model.

The MagnaGrasp team and their device.



Jerd came to the program directly after receiving a B.S. in biomedical engineering at Georgia Tech, with the goal of working in management in the medical technology industry. Sara and Matthew are both M.D.'s who hope to use their MTM training to help develop new devices and methods for use in patient care. Matthew is in the fifth year of his general surgery residency at UCSF, with a background in engineering at Georgia Tech and an interest in systems-based solutions to fundamental healthcare delivery problems. Sara is a clinical fellow in Reproductive Endocrinology and Fertility at UCSF and has remained a practicing physician during the MTM program.

HDL Nexus

Camisha Card, Sanjit Datta, and Kevin Keith have spent the past year working with project leader Michael Oda, Ph.D., Associate Staff Scientist at Children's Hospital Oakland Research Institute. Their project has been to validate and define the commercialization path for the HDL Nexus assay, a novel test of high-density lipoprotein (HDL) function. This assay will fill a critical need in the medical community for diagnostic tests to accurately and precisely assess a patient's risk of cardiovascular disease, in particular women and younger subjects, a poorly served population. Current practices look only at HDL cholesterol levels, and recent clinical trials have demonstrated that HDL function is a better indicator of cardiovascular disease risk. The MTM team has analyzed market factors; validated the instrumentation; assessed the performance, consistency, accuracy and stability of the assay; and begun evaluation of human samples.

Master of Translational Medicine
UC Berkeley - UC San Francisco

Like all MTM students, they have a diverse set of background experiences and career goals. Camisha and Kevin came straight to Berkeley from undergraduate Biological/Biomedical Engineering degrees at Cornell and Clemson Universities, respectively. Camisha focused on intensive lab experience in microbiology and a research internship at Genentech, and plans an industry career in disease treatment protocols. As an undergrad, Kevin concentrated on global health research and application, working in Tanzania, Singapore, Liberia, and Nicaragua as well as laboratories around Clemson. He plans a career in the clinical research industry, but is also considering returning for a Ph.D. After extensive undergraduate research in biomedical engineering at Johns Hopkins University, and R&D work at a biotech startup, Sanjit remains focused on the intersection of clinical medicine and technology and plans to attend medical school.

The HDL Nexus team

The path of alumni

Many MTM projects from the past three years show promise for commercialization and are continuing in development. 2011 MTM alum Siddarth Satish has founded startup Gauss Surgical, developing a product to estimate surgical blood loss, and has received over $1 million in venture funding. Existing BioE startup NanoNerve, with input from two teams of MTM students, has just achieved highly competitive Phase II Small Business Innovation Research (SBIR) funding.

MTM graduates are trained and poised to hit the ground running in the race to improve healthcare and clinical practice, whether working in industry or the medical profession.

About the program

The Master of Translational Medicine program draws on the unique expertise and technological resources available at UC Berkeley and UC San Francisco to provide trainees with the tools necessary to address real world problems in a creative, interdisciplinary team setting.

The unique one-year program is designed for engineers, scientists, and clinicians who seek to bring innovative treatments and devices into clinical use. Individuals with backgrounds in medicine, nursing, dentistry, and pharmacy are encouraged to apply. Coursework includes the fundamentals of bioengineering, physiology and disease, engineering design, core medical principles, clinical research methods, and clinical trials design, as well as the basics of business and management.

The program culminates in a capstone design project in which students work in interdisciplinary teams co-advised by engineering faculty and an MD, PharmD, or clinician.

"I gained a better understanding of innovation at the university level while gaining insight in how to translate ideas into tangible results. The MTM program laid the groundwork to forge a path in medtech innovation through the coursework and project collaborations."

Recent graduate Matthew Swisher

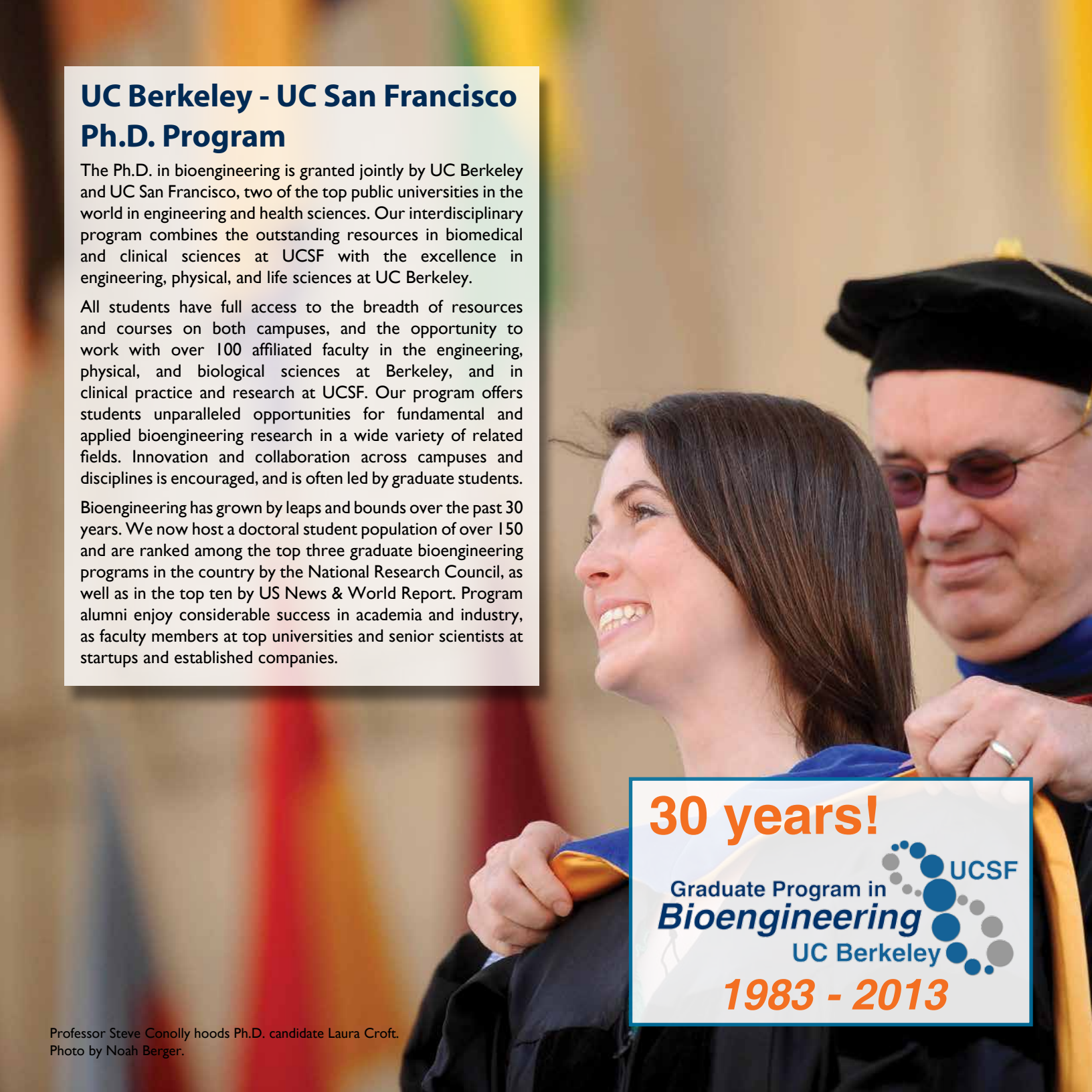
Working on the HDL Nexus assay. Photo courtesy of Children's Hospital Oakland Research Institute.

UC Berkeley - UC San Francisco Ph.D. Program

The Ph.D. in bioengineering is granted jointly by UC Berkeley and UC San Francisco, two of the top public universities in the world in engineering and health sciences. Our interdisciplinary program combines the outstanding resources in biomedical and clinical sciences at UCSF with the excellence in engineering, physical, and life sciences at UC Berkeley.

All students have full access to the breadth of resources and courses on both campuses, and the opportunity to work with over 100 affiliated faculty in the engineering, physical, and biological sciences at Berkeley, and in clinical practice and research at UCSF. Our program offers students unparalleled opportunities for fundamental and applied bioengineering research in a wide variety of related fields. Innovation and collaboration across campuses and disciplines is encouraged, and is often led by graduate students.

Bioengineering has grown by leaps and bounds over the past 30 years. We now host a doctoral student population of over 150 and are ranked among the top three graduate bioengineering programs in the country by the National Research Council, as well as in the top ten by US News & World Report. Program alumni enjoy considerable success in academia and industry, as faculty members at top universities and senior scientists at startups and established companies.



Professor Steve Conolly hoods Ph.D. candidate Laura Croft.
Photo by Noah Berger.

Kassianidou wins International HHMI Fellowship

BioE graduate student Elena Kassianidou has been awarded an International Predoctoral Fellowship from the Howard Hughes Medical Institute (HHMI).

Kassianidou, a native of Cyprus, is pursuing her dissertation in professor Sanjay Kumar's lab. She is working to identify the parameters that contribute to stress fiber tension generation in human glioblastoma cells, the most common and aggressive form of brain cancer.

HHMI this year awarded only 42 fellowships to international students studying in the U.S. from 19 countries. This is the first such fellowship awarded to any of our graduate students, and the first to a student from Cyprus.

Kassianidou hopes to contribute to the growing field of bioengineering in her country. "I am particularly interested in teaching, and I would like to use my teaching experiences from the U.S. to improve higher education in Cyprus," she said.

The fellowships are designed to fund the students' third through fifth years of graduate education—a pivotal time of intense laboratory research for their doctoral dissertations.

Natividad-Diaz wins for cell-sorting device

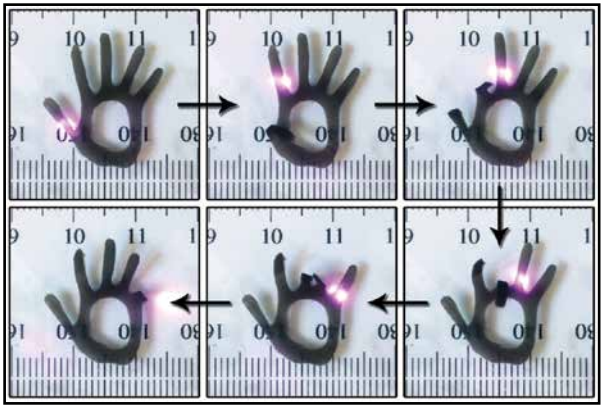
Bioengineering Ph.D. student Sylvia Natividad-Diaz won second place in the 2013 Prize for Primary Healthcare, a Center for Integration of Medicine and Innovative Technology-Ambulatory Practice of the Future competition.

This award for technology innovation is designed to encourage engineering students to apply their skills toward developing novel approaches supporting the work of primary caregivers in healthcare.

Natividad-Diaz won $100,000 for her promising new approach to cell sorting of blood samples. The most immediate application is to help HIV patients of limited resources manage their medications. Her technology requires no electrical power and utilizes very low-cost disposables to accomplish flow cytometry and easily establish CD4+ cell counts from small samples. She is a member of Professor Kevin Healy's lab, and is working on this project in addition to her dissertation.

NSF graduate student fellowships

Congratulations to Daniel Hensley, Kesshi Jordan, Isaac Joseph, Preeya Khanna, Harrison Liu, Ryan Orendorff, and Julea Vlassakis, our seven new inductees into the National Science Foundation (NSF) Graduate Research Fellowship Program. Bioengineering currently has 18 students with NSF fellowships!



This graphic shows how a 2cm hand, made of a new hydrogel material, can be controlled by near-infrared laser light.

Lee's light-controlled gel advances soft robotics

Researchers led by bioengineering professor Seung-Wuk Lee have created a hydrogel that can be manipulated by light.

This shape-changing gel, a biopolymer made of thin sheets of graphene combined with elastic proteins, is built with one side more porous than the other. Structures made of the gel expand and shrink unevenly in response to a beam of light and move in a controlled and predictable manner. Their popular video of a waving hand made of hydrogel demonstrates the controlled motion possible.

The material could have future applications in the emerging field of soft robotics, and in drug delivery and tissue engineering. The research, co-authored with graduate students Eddie Wang and Malav Desai, was published in May in *Nano Letters*.

Arkin challenges microbiology orthodoxy

Bioengineering professor Adam Arkin and collaborators published new findings this year which suggest that bacteria in the laboratory show little adaptive gene regulation in response to their environment.

It has been a key tenet of microbiology that in response to environmental changes, bacterial genes will boost production of necessary proteins and decrease production of those not needed. Arkin and his colleagues found that in the laboratory, most bacterial genes appear to be regulated by signals unrelated to their function. The team studied the gene expression of three bacteria in depth, and plan to expand their analysis to 100 more. Their work was published in the April 2013 *Molecular Systems Biology*.

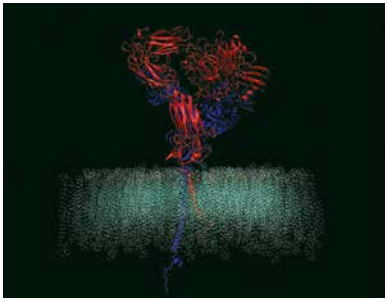
Large-scale production of artemisinin

Twelve years after bioengineering and chemical & biomolecular engineering professor Jay Keasling learned how to engineer yeast to produce the potent anti-malarial drug artemisinin, manufacturing plants are launching large-scale production of the medication.

The engineering of artemisinin is the first big success for the new field of synthetic biology, which could make this expensive treatment affordable to more of the 200 million people around the world who suffer from malaria.

See a video on this inspiring story at http://goo.gl/r6EdQV

Mofrad models cell-environment interaction



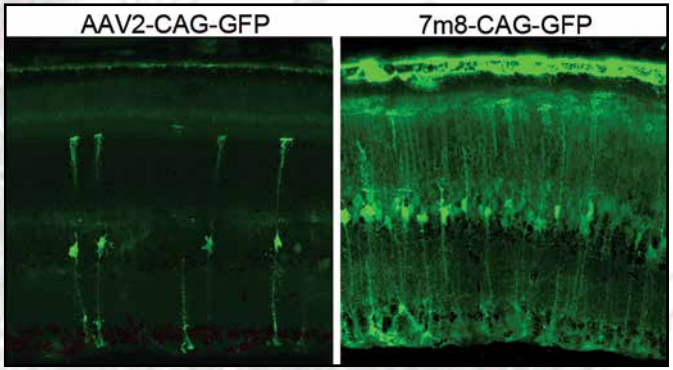
This schematic shows integrin components protruding from a cell membrane.

Cells interact with their surroundings all the time, but it is very difficult to observe the main player in this interaction—a protein called integrin. Professor Mohammad Mofrad and bioengineering graduate student Mehrdad Mehrbod have developed a computer model of integrin that gives researchers a new way to explore how the protein connects a cell's inner and outer environments. This research was reported in the journal *PLoS Computational Biology*.

Schaffer develops new therapy to restore sight

Researchers led by Professor David Schaffer and colleagues have developed improved gene insertion techniques that could expand gene therapy to help restore sight to patients with blinding diseases.

The team has designed an easier and more effective method to deliver viruses carrying normal genes to damaged areas of the retina. Current gene delivery treatments attempt to inject the virus directly into the retina of the eye, with limited success. The new treatment uses a variant of a common benign virus that has been engineered to penetrate the retina, and can be injected easily into the eye.



Eye cells labeled with green fluorescent protein have successfully taken up the virus, showing that the 'evolved' virus (right) is more effective than the virus currently used for gene therapy (left). The new virus is particularly good at targeting the critical photoreceptors (top layer).

Schaffer and John Flannery, UC Berkeley professor of molecular & cell biology and vision science, along with colleagues from UC Berkeley's Helen Wills Neuroscience Institute and the Flaum Eye Institute at the University of Rochester in New York, published the results of their study June 12 in the journal *Science Translational Medicine*.

Seung-Wuk Lee receives R&D 100

Bioengineering professor Seung-Wuk Lee was honored with a 2013 *R&D 100 Award* for his development of an engineered virus which generates electricity.

Presented by R&D Magazine, the R&D 100 Awards recognize the year's top 100 technology products from industry, academia, and government-sponsored research, and are often called the "Oscars of Innovation".

Lee's Bacteriophage Power Generator generates power using harmless viruses that convert mechanical energy into electricity. The technology was developed by Seung-Wuk Lee with Lawrence Berkeley Laboratory scientists Ramamoorthy Ramesh and Byung Yang Lee, and is the first to produce electricity by harnessing the piezoelectric properties of a biological material.

Diagram of the adeno-associated virus. Researchers changed ten amino acids in one of the coat proteins (orange) to allow it to pass through retinal cells to the target photoreceptors. Image courtesy of Schaffer Lab.

Terry Johnson wins Distinguished Teaching Award

Bioengineering lecturer Terry Johnson was awarded the 2012 Distinguished Teaching Award. He is the first instructor in the Department of Bioengineering to receive the award.

Berkeley's most important recognition for teaching, the Distinguished Teaching Award recognizes teaching that "incites intellectual curiosity in students, engages them thoroughly in the enterprise of learning, and has a lifelong impact." The process is extremely selective, honoring only a few of our over 1,500 instructors each year.

Johnson joined the Department of Bioengineering in 2001 as a lab manager and teaching assistant for our very first laboratory course, BioE 115, Cell Biology Laboratory for Engineers. He is currently teaching BioE 10, Introduction to Biomedicine for Engineers; BioE 104, Biological Transport Phenomena; and BioE 301, Teaching Techniques for Bioengineering.

Over 2,000 students have passed through his courses in the past twelve years, leaving behind evaluation comments like this one: "*If every professor were like you, people would never want to leave college.*"

Johnson in the BioE Teaching Lab. Photo by Peg Skorpinski

Capstone team wins NIH Honorable Mention

A team of students from the Fall 2012 capstone design course have received an Honorable Mention in the NIH 2013 Design by Biomedical Undergraduate Teams (DEBUT) Challenge competition.

The team received one of only two Honorable Mentions awarded in the Diagnostic Devices/ Methods category, in essence tying for second prize in that area. DEBUT is a biomedical engineering design competition for teams of undergraduate students in the areas of diagnostics, therapeutics, and technologies for underserved populations, managed by the National Institute of Biomedical Imaging and Bioengineering (NIBIB) of the NIH.

The team of Nasim Barzanian, Sakthivel Nagaraj, Neil Ray, and Jeffrey Yang submitted their prototype Ballpoint Laparoscope, which tackles the problem of doing laparoscopic surgery when the tiny camera lens inside the patient becomes clouded with blood. Inspired by a ballpoint pen, the students created a rotating spherical lens which is constantly cleaned by integrated suction and saline.

Students in the capstone course partner with a physician to address a real clinical challenge. This team worked with Stanford surgical resident and physician Joseph Forrester. They have also won the top prize at Berkeley's Engineering the Future competition and filed for a provisional patent.

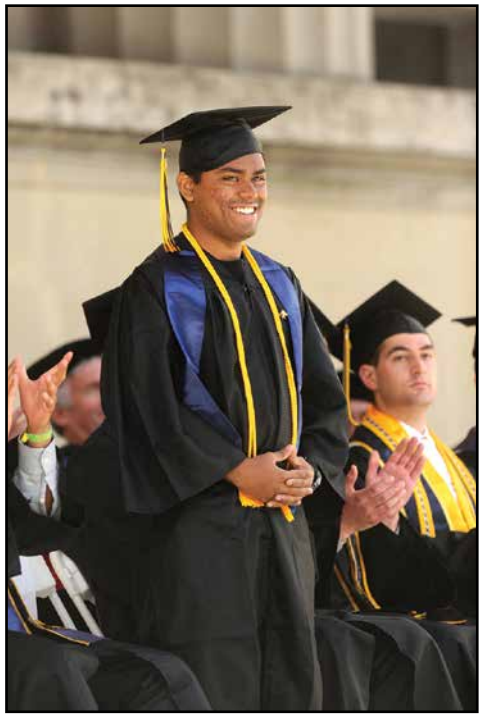
BioE startup wins $100k funding

Eko Devices, a startup company based on a project in the senior capstone design course, was one of two Berkeley startups to win $100,000 in funding from Founder.org. They are developing a diagnostic smartphone app that records and analyzes cardiac sounds to help healthcare professionals more readily identify potentially life-threatening heart conditions.

Das named first BioE University Medalist

Ritankar Das, double major in bioengineering and chemical biology, was named the 2013 winner of the University Medal.

Das, an 18-year-old who completed his double degree after just three years here, is the first ever bioengineer to win the top campus honor, and the youngest University Medalist in at least a century. He also earned a minor in creative writing, founded the *Berkeley Chemical Review* research journal, formed a campus chapter of the American Chemical Society, pursued significant research and public service projects, and is co-authoring a book with a university professor. He was also awarded the prestigious Barry M. Goldwater Scholarship.



This fall Das heads to Oxford University to pursue a master's degree in biomedical engineering with a Whitaker Fellowship. He will then continue his studies at the Massachusetts Institute of Technology, where he has been admitted to the chemistry Ph.D. program.

BioE was proud to see not just one, but two of our students become finalists for the University Medal. Rhodes Scholar Daniel Price was also one of the five top students considered.

BioE Boosters - Paul and Lois Lin

Bioengineering undergraduates will soon benefit from a significant new gift from Paul and Lois Lin, UC Berkeley alumni and longtime Berkeley benefactors.

The Paul Y. and M. Lois Lin Undergraduate Scholarship Fund in Bioengineering will assist bioengineering majors with meeting the rising costs of a Berkeley education.

"We paid so little to attend UC Berkeley compared to what it costs students today," said the Lins. "We want every undergraduate to have the chance to study at UC Berkeley, even if they or their parents cannot afford it."

The couple met while students at Cal and have been enthusiastic donors and friends of the campus for nearly fifty years. Paul earned his bachelor's and master's degrees (1964 and 1966) in Electrical Engineering and Computer Sciences, and Lois received her bachelor's degree (1966) in Biology-Ecology. Paul was vice president at Watkins-Johnson Co. in Palo Alto, producer of electronic products for the wireless-telecommunications and defense industries. Their gift to bioengineering represents a fusion of Paul's training in engineering with Lois' background in biology. ***Many thanks to the Lins for their generous gift!***

There are many ways to support Bioengineering students and faculty. You can give directly to Bioengineering by making a donation at ***GiveToCal.Berkeley.edu*** *(search for BioE). If you have questions or wish to consider other giving options, please email bef@coe.berkeley.edu or call 510.642.2487.*

I promise to bring surprise cookies to a random BioE lecture class!

Make a *Promise for Education*

A UC education costs more than ever. As a part of *Project You Can*, a systemwide effort to raise $1 billion for student support, the UC is launching Promise for Education, a fun new crowdfunding effort to raise money for undergraduate scholarships. Just log on to **PromiseForEducation.org** to make a promise, set a goal, and share it on your social networks. It's easy, it's fun, and it's for our students!

Alumni - Keep in touch!

Moving?
Update your contact information at @cal online – **cal.berkeley.edu** – so we can keep you in the loop.

@cal great minds online
UC Berkeley's online alumni community

Join our private **LinkedIn group,** *UC Berkeley Bioengineering*, to network and share tips with other alumni online. This is a great place to post jobs if your company is hiring!

Like our **Facebook page** to keep up with news and events. Find us at www.facebook.com/BerkeleyBioengineering.

BioE by the numbers

- *450* undergrads
- *190* Ph.D. students
- *38* professional master's degree students
- *37%* female students
- ranked *10th* in the USA - graduate and undergraduate!
- *1750* undergraduate applicants
- *550* Ph.D. applicants
- *19* core faculty
- *$21 million* in annual research expenditures
- founded in *1998*

Our Graduates

B.S.

Fall 2012

Hosna Akhlaghpour
Sung Bae
Maxwell Bates
Averee Chang
Atri Choksi
Andrew Ekelem
Inbal Epstein
Kenneth Gao
Gaurang Garg
Alex Javanpour
Tahim Kader
Anand Kesavaraju
Arthur King
Hee Lee
Xin Lin
Olga Miakicheva
Amirpasha Moghtaderi
Nawal Siddiqui
Joseph Silo
Hon Siu
Hawnlay Swen
Jen-Han Tao
Rahul Thakker
Helen Wan
Justin Wang
Zhuchen Xu
Mengyun Zhang

Spring 2013

Karen Burtt
Bryce Caputo
Jason Cham
Alice Chang
Emily Chang
Daniel Chao
Kellen Chen
Robert Chen
Patrick Chew
Marc Chooljian
Daniel Chung
Nicholas Elsbree
Nima Emami
Shayan Fakurnejad
Rebecca Farr
Benjamin Fortson
Harshitha Gamahewage
Megan Garber
Miguel Gomez
Stephi Hamilton
Audrey Han
Morgan Hulsey
Richard Hwang
Divya Israni
Annie Joseph
Devi Khoday
Bill Kuang
Sunny Kung
Connor Landgraf
Joseph Lee
Jacob Lewis
Larry Li
Ruo Lim
Albert Lin
James Lin
Kevin Lin
Uyen-Ninh Ly
Xian Ma
Carol Major
Alisha Manandhar
Homayun Mehrabani
Rishi Mehta
Kevin Meng
Melissa Milder
Michael Murata
Jangwoo Myung
Sakthivel Nagaraj
Michael Nasr
Hwan Park
Sandeep Prabhu
Daniel Price
Bo Qing
Archana Ramesh
Sachin Rangarajan
Deepak Ravichandran
Neil Ray
Lindsey Saldin
Tahoura Samad
Christina Schlesinger
Clare So
Supada Sritanyaratana
Yintao Sun
Sneha Thatipelli
Shivaba Thimmaiah
Matthew Tran
Uyen-Giao Tran
Ivaylo Valirov
Byungcheol Wang
Jeffrey Wang
Xiaodian Wang
Nathan Woo
Jonathon Wright
Jan Wu
Bowen Xie
Jeffrey Yang
Wisely Yang
Tak Yau
Joy Yeh
Andrew Yu
Jing Yu
David Zeng
Kevin Zhu

Master of Translational Medicine

2012-2013

Camisha Card
Davis Carlin
Giovanny Casadiego Cubides
Tiffany Chan
Sanjit Datta
James Heller
Kevin Keith
Joanna Ma
Brian McRae
Alan Neo
Jerd Phichitkul
Sara Pittenger
Clay Reber
Emily Schoenhoff
Matthew Swisher
Nan Tian

M.S.

Spring 2013

Dong Shin Choi

Ph.D.

Fall 2012

Howard Chou
Chi-Cheng Fu
Adam Hickenbotham
Pamela Jackson
Kimberly Kam
Joshua Kittleson
Garmay Leung
Frank Myers
Reza Naima
Eugene Ozhinsky
Zhenyu Tang
Samuel Tia
An-Chi Tsou
Gautham Venugopalan
John Waldeisen
Eddie Wang
Oscar Westesson
Weston Whitaker

Winter 2013

Lalitha Muthusubramaniam
David Tran

Spring 2013

Allison Berke
Jonathan Foley
Jeffrey Henry
Alex Hughes
Kelly Karns
Debkishore Mitra

Tahoura Samad, winner of the 2013 Chair's Award in Bioengineering, leads students in to commencement. Photo by Cindy Manly-Fields.

Alumni Profile

Ehsan Saadat (B.S. 2006) is a third year resident in orthopaedic surgery at Harvard Medical School.

How did you get from Berkeley to where you are now?

The path to where I am now was not what I would have imagined eleven years ago when I started at Berkeley. I had always known that I wanted to become a doctor, and started at Berkeley as an undecided major in Letters and Science, when I came across a class called Freshman Seminars in Bioengineering. We spent an hour per week listening to professors talk about their research. It didn't take long for me to realize that what I liked more than the pure science of biology and chemistry was to think about how to apply my understanding of biological systems to solve tangible problems for real people.

In my second year I was able to begin research on osteoarthritis with Professors Karen King and Sharmila Majumdar, which then grew into a rich collaboration with Drs. Michael Ries and Benjamin Ma at UCSF. I took a year off after college to pursue this interest and, once admitted to UCSF, was lucky to continue to work with my mentors during medical school.

What is awesome about your job?

What I absolutely love about orthopaedics is the ability to do real and tangible good for patients at a very vulnerable time of their lives. From taking care of a trauma patient, to someone who is unable to walk from the constant pain of arthritis, I love having the ability to do technically-challenging work to save or improve people's lives. Seeing patients come back to the clinic with a smile on their face is what makes the long hours and hard work well worth it. Orthopaedics lets me dovetail my knowledge of biology and engineering with human anatomy every day in the operating room.

What is the hardest thing about it?

Taking care of others is a hard task, with many sleepless nights —because you may be in the operating room, or because you are up all night worrying about a patient or preparing for the next step of their care. Having a good network of support, of family and friends as well as colleagues, is hugely important.

How did bioengineering prepare you for your work?

What bioengineering taught me was not only how to understand a complex system by reducing it to its core elements, but also how to use that system to create a desired effect, or to change the system itself for the better. Being able to understand these principles and designs as an engineer makes me a better orthopaedic surgeon.

Do you miss anything about Berkeley?

What I miss most about Berkeley is the openness of its academic environment and the ample time and opportunity as an undergrad to pursue learning and exploration. Berkeley finds a way to challenge every student in one way or another, and the four years I spent at Berkeley were some of the most formative years of my life.

Any advice for current students?

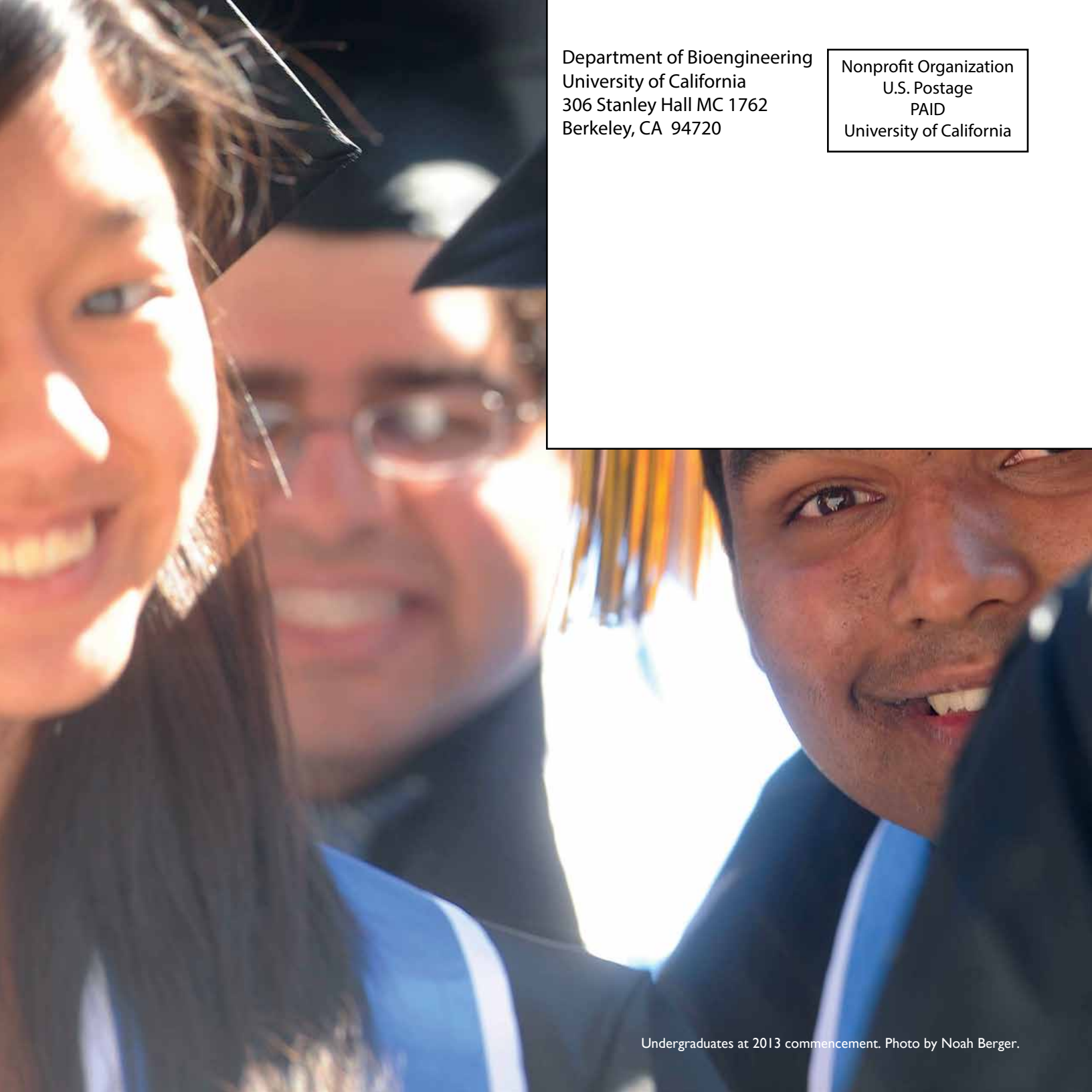
I will pass on a piece of advice that I got from one of my professors at Berkeley. *Follow your gradient: do what you love, do it passionately and honestly, and trust that your path becomes clear as time goes on.* Success is an outcome, not a goal, and it comes to those who are too busy to be looking for it. Allow life to play itself out. You should fight for what you want, but also realize that sometimes not getting what you want can be a wonderful stroke of good luck. Use setbacks as a chance to grow. And remember, Berkeley is a truly special place; take advantage of it while you are here.

Have any experiences made a big impact on you?

The experience of taking care of the Boston Marathon bombing victims this past April will always stay with me. It was remarkable and gratifying to see how well we all came together to do what needed to be done. Although we see awful injuries every day, the volume of this event and the fact that so many of the victims were close to our own ages made it especially hard. But the feeling of pride and privilege for having the skills and the opportunity to take care of other human beings that night was undeniable.

Department of Bioengineering
University of California
306 Stanley Hall MC 1762
Berkeley, CA 94720

Nonprofit Organization
U.S. Postage
PAID
University of California



Undergraduates at 2013 commencement. Photo by Noah Berger.