Berkeley BioE

2014

Message from the Chair

Dear Friends of Berkeley Bioengineering,

I'm pleased to share with you our 2013-2014 annual report. Over the past year, Bioengineering at Berkeley has continued to thrive. Our national ranking has risen steadily as the department matures and our reputation spreads, placing us solidly in the top ten nationwide in both undergraduate and graduate education.

Our graduates are accomplishing great things in both academia and industry, and an ever-increasing number of flourishing startup companies are founded by both graduate and undergraduate alumni. With our students achieving such success, we wanted to take a moment this year to examine the roots of this prosperity. In our *Where do bioengineers come from?* feature, we share the early triumphs and setbacks of our students and faculty. The common denominators for all bioengineers are curiosity, spirit, and the determination to always keep going.

We are tightening our focus on the area of translational medicine, advancing healthcare through the discovery of fundamental principles of biological systems and the development of advanced clinical technologies. In this publication you'll see several examples of our work in this area, including Irina Conboy and Song Li's discoveries in regenerative medicine, and Amy Herr and Seung-Wuk Lee's advances in biological sensors and diagnostics.

This year we are recruiting two tenure-track faculty members in the broad areas of translational engineering and neural engineering. Please direct any suitable applicants to our website for details.

The success of our program is made possible by the energy and commitment of our faculty and students, who never fail to go the extra mile and astound us with their dedication, enthusiasm, and expertise. We invite you to join in supporting and rejoicing in these accomplishments with us. *Go Bears!*

Best wishes,

Kevin E. Healy
Jan Fandrianto Distinguished Professor and Chair
Department of Bioengineering, University of California, Berkeley

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bioeng@berkeley.edu
510-642-5833

Chair Healy with undergrad Connor Ludwig. Photo by Cindy Manly-Fields.
On the cover: 2014 MTM program graduate, Stephanie Kwan. Photo by Matt Beardsley Creative.

Established in 1998	6 undergraduate concentrations	350 undergraduates	Over 140 peer-reviewed faculty publications last year	550 Ph.D. applicants
Faculty honors: 12 AIMBE Faculty Fellows	Faculty honors: 2 NIH New Innovator Awards	$27 million in annual research expenditures	Undergraduate program ranked 9th in the USA	160 Ph.D. students
Faculty honors: 3 Presidential Early Career Awards (PECASE)	Over 50 undergraduate courses		Faculty honors: 2 National Academy of Engineering members	20 core faculty
37% female, undergraduate 42% female, graduate	Ph.D. program ranked 7th in the USA	52 professional master's degree students	1901 undergraduate applicants	157 active or pending faculty patents
Faculty honors: 11 NSF CAREER Awards	9 joint faculty, 5 lecturers	Faculty honors: 3 AAAS Fellows	Faculty honors: 3 TechReview35	7 named faculty chairs

Undergraduate Program

One of the top ten undergraduate bioengineering programs in the country, Berkeley Bioengineering gives talented students a hands-on environment for exploring an engineering approach to biological systems. Our curriculum provides a strong foundation in science and engineering, and the ability to specialize in practical areas of interest in the growing field of bioengineering.

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.

Recently, students in our capstone design course have won undergraduate design competitions, and several have founded startup companies based on their projects.

Berkeley offers a wealth of opportunity for learning, research, service, and community involvement. Our graduates have found great success in industry careers, as well as admissions to top graduate and medical schools.

Students at the annual BioE picnic. Photo by Cindy Manly-Fields.

Master of Engineering

The Bioengineering Master of Engineering (M.Eng.) degree is a new and rapidly growing program at UC Berkeley. The curriculum 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 professional program have a combination of technical and economic understanding that allows them to quickly assume leadership roles in their engineering careers.

Degree requirements focus on three areas of coursework.

- The core leadership curriculum: instruction in a broad set of management skills needed to lead technology enterprises and ventures.
- A technical specialty: deeper instruction in a technical area, chosen from many 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.

UC Berkeley - UC San Francisco Ph.D.

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.

The program attracts the best and brightest students, who have remarkable success in winning extramural fellowships and awards, collaborating across disciplines, and innovating unique solutions to problems ranging from basic science to global healthcare.

All students have full access to the breadth of resources and courses on both campuses, known for outstanding biomedical and clinical sciences at UCSF and excellence in engineering, physical, and life sciences at UC Berkeley. We offer students unparalleled opportunities for research in a wide variety of fundamental and applied fields.

Alumni enjoy considerable success in academia and industry, as faculty members at top universities, and senior scientists at startups and established companies.

Our program continues to grow. It is ranked among the top three graduate bioengineering degrees in the country by the National Research Council, as well as in the top ten by *US News & World Report*.

UC Berkeley - UC San Francisco Master of Translational Medicine

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

Former students have found successful careers in industry and institutional medical research, while several graduates are pursuing their own startup companies.

The unique one-year program is designed for engineers, scientists, and clinicians who seek to bring innovative treatments and devices into clinical use. 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 and clinical faculty.

Professor Amy Herr and recent Ph.D. Kelly Gardner. Photo by Noah Berger.

Where do bioengineers come from?

Entering the job market is a stressful time. Sometimes it can seem like an entire future career relies on getting that perfect internship, or that one special first job—but we know that some of our greatest success stories came from humble origins. These bioengineers shared with us how they got started in research and in the working world.

Jonathan Tsang, B.S. 2003
Associate Director, API Operation Lead, Tech Transfer, Bayer Healthcare

My first job: I sold candy at a baseball park.

After graduation: I worked as a Peptide Chemist at what could only be classified as a "Peptide Sweatshop." While working way more hours than is legal, I developed a good background in purification, organic, and analytical chemistry techniques. The technical skills I gained from that position help me to this day.

Dan Fletcher
Bioengineering Professor

My first science project: A science fair project on which roofing material keeps you coolest. (A relevant question in Texas.) I set up a heat lamp, a little wooden house with different roofing materials that could be exchanged, and a thermometer inside.

My first job: Dishwasher at a bakery.

Dino Di Carlo, B.S. 2002, Ph.D. 2006
Bioengineering Professor, UCLA

My first science project: I was always making things and experimenting—I tried to make rockets out of pieces of bamboo and hairspray, and I made a bow and arrow that shot three arrows at a time. Nothing worked very well!

My first job: Math and computer science tutor for a high school student when I started college, and an intern at Sandia National Labs the summer after graduating with my BS.

Jeff Roe, Ph.D. 1989
Founder & CEO at DeviceFarm

My first job: I mowed yards then progressed through multiple other dirty jobs that made me want to go to college.

Phil Messersmith
Bioengineering Professor

My first job: Attendant at a Union 76 gas station. This was back in the days when the gas station attendant pumped your gas, cleaned your windows, checked oil and transmission fluid levels, and put air in the tires.

Angela Ha, B.S. 2008
Software Product Manager, Theranos

My first job: In junior high I tutored my piano teacher's 4th-grade son in math and English for $10 an hour. I got a raise to $11 an hour when by chance I gave him a practice essay topic which just happened to be the same topic he was tested on the next day.

After graduation: I joined Accenture as a systems-integration analyst after a summer internship. I was interested in pursuing consulting because I wanted to be exposed to different projects, work in a fast-paced environment, and have the opportunity to travel.

Cory Laws, B.S. 2007, Ph.D. 2013
Johnson & Johnson Development Corporation

My first science project: Beyond smashing carburetors with a hammer when I was 4, my first project was after I bought my first car in high school. The speedometer on my 1966 VW Microbus didn't work and I discovered that the wiring harness was chopped. I replaced the entire electrical system by hand and, in many cases, ran wires from the front to the engine in the rear. I then had to rebuild the engine by hand from the engine block all the way out to superficial components like the fan shroud and coil. And then when I drove it up to Cal for college, I had to rebuild the engine again.

My first job: In-N-Out Burger in high school. So much free food!

Vince Rubino, B.S. 2001
Senior Supervisor, QA Validation at BioMarin Pharmaceutical, Inc.

My first job: Working as an "Explainer" at the Exploratorium in San Francisco, a museum of science and perception, when I was in high school. My job was to provide demonstrations and explain the science behind the exhibits. This experience, of learning and teaching in a hands-on environment with people of a wide range of backgrounds and perspectives, helped me develop skills that remain of great value to me today as an engineer.

After graduation: I started as a summer intern, then worked as a Validation Engineer at Bayer in West Berkeley. My career has taken numerous twists and turns, however I have returned to my original role in validation of engineering processes for drug development and manufacturing. The appeal of validation is the mix of engineering and storytelling that goes into the required documentation.

Dr. David Rempel
Bioengineering Professor

My first science project: In middle school I became interested in amateur radio and began learning electronics and Morse code. Eventually I built my own radios and antennas. The antennas freaked out the neighbors.

Dr. Rustin Massoudi, B.S. 2009
Urology Resident Physician, Stanford Hospital & Clinics

My first job: My first paying job was at Cal as a Student Learning Center tutor. I mostly tutored undergraduate physics. It was a fun job and I liked helping people understand the concepts behind the questions.

Jay Keasling
Bioengineering Professor

My first science project: It's hard to remember one, we were always engineering on the farm. Lots of science as well: the chemistry of herbicides and pesticides, and antibiotics for pigs and cattle.

My first job: Pulling the tassels off corn in the summer.

Dr. Thomas Budinger
First Chair of Bioengineering, Professor Emeritus

My first science project: Locate an underwater mountain rising from 1.5 miles deep to within 109 feet of the sea surface, 300 miles west of the Oregon coast, that had not been mapped in 1954. Map its topography, determine its origin, measure the ocean currents in the locality, and sample the biological environment. This led to a career in imaging and multidisciplinary projects.

Diana Wong, B.S. 2004
Lieutenant Engineer, U.S. Public Health Service

My first science project: When I was in kindergarten my father gave my sister and me each a prism. On our own, we could separate light into a beautiful rainbow. If we were getting along, we could put the prisms together and split and recombine the rays of light. Good thing they weren't lasers because I'm sure we would have gone blind when our curiosity got the better of us—we stared through the prisms for hours on end, enthralled with the light diffraction.

My first job: CA Assemblymember Dutra's intern. It did not pay very well, but the experience outweighed any cash.

After graduation: A biotech startup in San Francisco, working on the web and database interface for clone-designing software.

Cheng Li, B.S. 2002, Ph.D. 2008
Project engineer at Teleflex

My first job: Cashier and expediter at Burger King.

After graduation: An engineer at TriVascular2, a startup medical device company.

Steve Conolly
Bioengineering Professor

My first job: Dishwasher at an Italian restaurant; it paid $2.35 per hour and all the food I could eat. And then a dozen summer jobs in food service and assembly coding.

Li Lab shows physical cues help mature cells revert to embryonic-like stem cells

Professor Song Li and his research team have shown that physical cues can replace certain chemicals when inducing mature cells back to a pluripotent stage, capable of becoming any cell type in the body.

Tim Downing, recent Ph.D. alum from Professor Li's lab, grew fibroblast cells on surfaces with tiny parallel grooves only 10 micrometers wide and 3 micrometers high.

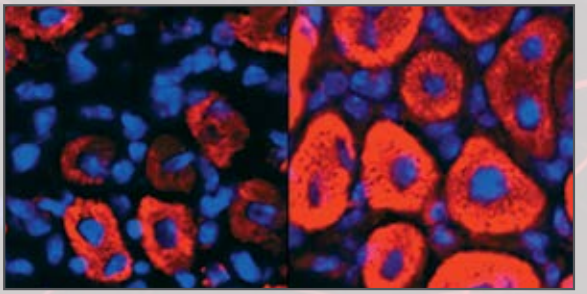
The new study found that culturing cells on micro-grooved biomaterials improved the quality and consistency of the reprogramming process, and was just as effective as the chemical compounds currently used to boost the efficiency of cell reprogramming. The study was published in *Nature Materials*.

Conboy Lab discovers oxytocin aids muscle regeneration

New research from Professor Irina Conboy's lab shows that oxytocin, known as the "trust hormone," is indispensable for healthy muscle maintenance and repair, and that in mice it declines with age.

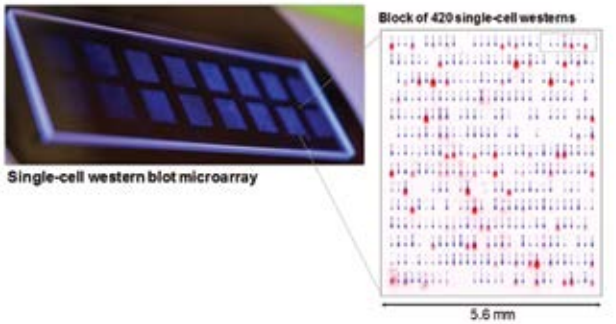
After treating injured mice with the hormone, the researchers found that the muscles of mice that had received oxytocin injections healed far better than those of a control group, and that the aged mice healed nearly as well as young specimens.

Published in June in *Nature Communications*, the study presents oxytocin as the latest treatment target for age-related muscle wasting, or sarcopenia.



Old muscle tissue, left, shows a lower density of muscle fibers, increased scar tissue and inflammation. The addition of oxytocin to the blood of old mice rejuvenates the old muscle, as shown on the right. (Photos by Wendy Cousin and Christian Elabd)

Neuron image courtesy of Song Li's lab.



Herr and Schaffer bring highly specific protein measurements to single cells

A major challenge in biological research is quickly and accurately identifying specific proteins in a single cell. The workhorse single-cell tool, flow cytometry, suffers from limited performance, while the highly-specific Western blot has not been able to measure proteins in a single cell.

Using microfluidic design and commonly available materials, members of Professors Amy Herr's and David Schaffer's labs have expanded the highly specific measurements made with Western blots to single cells. They use microarray-like formats and tiny electrophoretic separations to sort proteins by size, followed by the standard antibody-based detection. The single-cell Western (scWestern) detects as many as eleven protein targets in one cell, and can assay about 2,000 individual cells in under four hours.

This new method could allow identification of fleeting interactions and similar but unique proteins, and could be especially useful in understanding stem cell differentiation and differences among rare cell types, like circulating tumor cells.

This research was published online in *Nature Methods* in June, with lead authors Alex Hughes (BioE Ph.D. 2013) and Dawn Spelke (BioE graduate student). In the first week of publication the article was ranked the #1 most emailed and #4 most read.

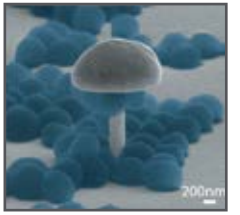
Seung-Wuk Lee's Lab creates early warning system for toxins

Inspired by the way a turkey's skin changes color, Professor Seung-Wuk Lee's team has devised a bacteriophage-based sensor whose color changes upon binding specific molecules.

The researchers used the M13 bacteriophage, self-assembled into bundled nanofibers with a structure similar to collagen bundles in turkey skin. The viral nanofibers swell upon exposure to a variety of volatile organic compounds, such as methanol or hexane, causing a visible color change due to differential light scattering. The phages are easy to genetically modify, allowing Lee and his colleagues to build nanofibers capable of binding specific compounds of interest—such as TNT. This research was published in *Nature Communications*.

Mofrad shows how bacteria stick to nanostructures

Professor Mohammad Mofrad and his lab have investigated, for the first time, how individual Staphylococcus Aureus cells attach to metallic nanostructures of various shapes and sizes.



SEM image of bacterial cells suspended from a nanostructure.

The bacterium Staphylococcus Aureus is a common source of infections that occur after surgeries involving prosthetic joints and artificial heart valves, but a Staph infection can't start unless Staphylococcus cells first cling to a surface. Mofrad's discoveries may lead to development of bacteria-resistant materials as a line of defense.

Herr and Li new AIMBE Fellows

Congratulations to Professors Amy Herr and Song Li, new members of the American Institute for Medical and Biological Engineering College of Fellows! The College of Fellows is comprised of the top two percent of medical and biological engineers in the country.

Kumar & Murthy receive Keck grant for single-cell proteomics

Professors Sanjay Kumar and Niren Murthy have been granted a $500,000 research award from the W.M. Keck Foundation for their project, Single Tumor Cell Proteomics for Diagnosis and Prognosis. Their research aims to develop an enzyme-linked immunosorbent assay (ELISA) platform that will allow researchers to routinely perform single-cell proteomic experiments.

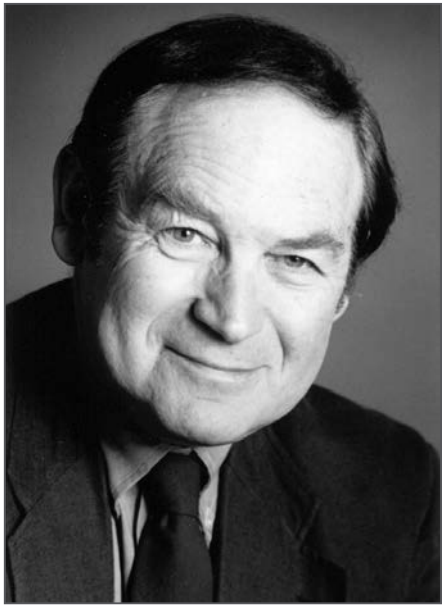
Capstone startup wins prizes

Founded by 2012 undergraduate alumna Charvi Shetty, and a product of the BioE 192 senior capstone design course, Knox Medical Diagnostics is designing a portable spirometer with a mobile interface. The device tracks asthma severity to allow for personalized, real-time treatment. Knox placed first at the 2014 INNOVATE@BERKELEY Startup Expo, was a winner of the 2014 Biotech Challenge, and became one of the 2014 *The Foundry @ CITRIS* teams.

First malaria drugs sent to Africa

The first 1.7 million treatments of semi-synthetic artemisinin have been shipped to malaria-endemic countries in Africa. This synthetic biology breakthrough was engineered by Professor Jay Keasling's lab and produced through a partnership with Amyris Biosciences, Sanofi, and the global health nonprofit organization, PATH.

In Memoriam: Stanley Berger



Stanley A. Berger, Montford G. Cook Professor Emeritus of Bioengineering and Mechanical Engineering and an expert in fluid mechanics, died on Nov. 25, 2013. He was 79.

In his 50 years on the UC Berkeley faculty, Berger applied his knowledge to solving real-life problems in physiology, medicine, and engineering, on topics ranging from sickle cell anemia to vortex breakdowns in aircraft flight. He was best known for his research on the mechanics of blood flow. He was instrumental in work with the UCSF School of Medicine on analyzing the progression of arterial and atherosclerotic diseases, work that had a direct effect on the diagnosis and treatment decisions being made by radiologists and surgeons.

Berger was one of the founders of the UC Berkeley Department of Bioengineering in 1998 and the UC Berkeley – UCSF Graduate Program in Bioengineering in 1983, and actively shaped the direction of the department and the graduate program. He will be missed.

Healy named AAAS Fellow

Kevin Healy, Chair of Bioengineering and Professor of Bioengineering and Materials Science & Engineering, has been named a Fellow of the American Association for the Advancement of Science.

Healy was elected by his peers for distinguished contributions to the fields of bioengineering and biomaterials science, particularly for the understanding and development of bio-inspired materials.

BioE students speak at commencement

Two BioE graduates were selected to be the student speakers at the 2014 College of Engineering Commencement Ceremonies. Rachel Cheng and Helen Sun delivered a dynamic and inspiring tag-team speech to their peers. Watch it online at *http://bioeng.berkeley.edu/?p=5830*.

Capstone team takes 2nd in ASME Undergraduate Design Competition

A team of students in the Fall 2013 senior capstone design course won Second Place in the American Society of Mechanical Engineers Undergraduate Design Competition this summer.

The team of Andrea Dickey, Noah Goldman, Geonyoung Kim, and Robin Parrish designed the Demilune Walker, a compact walker that assists the elderly moving about in small spaces to prevent falls. Three team members presented their project at the World Congress of Biomechanics in Boston.

Bioengineers win big in Big Ideas

A team of BioE Master of Engineering students took first place in the campus Big Ideas competition for their ENOSE non-invasive blood sugar monitoring system. Two BioE undergraduate capstone teams took 3rd place and an honorable mention.

ENOSE team members Patrick Lyon, Benson Fan, Yayun Chen, and Ray Chiu worked with Bioe professor Seung-Wuk Lee to develop a colorimetric sensor that could provide an inexpensive, non-invasive test for determining the level of glucose in a patient's blood.

How much do BioE students love Berkeley? SO much that they put their money where their hearts are. Congratulations 2014 BioE Bears—top fundraisers for the senior class gift!

Photo by Matt Beardsley Creative.

30th Anniversary

Graduate Program in Bioengineering UCSF UC Berkeley

Happy 30th, BioE!

On April 26, alumni, faculty, and students celebrated the 30th anniversary of the UC Berkeley – UC San Francisco Graduate Program in Bioengineering with a party and short talks by program alumni. See photos and videos of the event online at *http://bioegrad.berkeley.edu/30th*.

Alumnus speaker Wilbur Lam chatting with attendees. Photo by Matt Beardsley Creative.

A big crop of graduate fellowships

Students in the Bioengineering Ph.D. program had another outstanding year, garnering over 35 new campus and extramural fellowships.

- We currently have **28** students with *NSF Fellowships*.
- 2014 brought **17** NEW *NSF Fellows*:
  Carmen Chan, Ben Dichter, Chris Eiben, Roberto Falcon-Banchs, Kayla Felger, Christina Fuentes, Shaheen Jeeawoody, John Kim, Amy Liao, Cameron Nemeth, Karen Samy, Olivia Scheideler, Andrew Sczesnak, Daniel Silversmith, Elaine Su, Sally Winkler, and Xinyi Zhouare.
- We now have **5** *2015 Siebel Scholars:*
  Sergey Boyarskiy, Wen-Chin Huang, Sophie Wong, Erh-Chia Yeh, and Bo Zheng.
- **9** of the *inaugural UCSF Discovery Fellows are from BioE*:
  Alec Cerchiari, Trey Jalbert, Bertram Koelsch, Christine Leon, Harrison Liu, Yekaterina Miroshnikova, Matthew Rubashkin, and Lawrence Uricchio.

Plus:

- One *Ford Foundation Fellowship*: Sylvia Natividad-Diaz.
- One *Hertz Foundation Fellowship* Judy Savitskaya.
- One *International Predoctoral Fellowship from the Howard Hughes Medical Institute*: Elena Kassianidou of Cyprus.
- One *UC Berkeley Dissertation-Year Fellowship*: Monica Kapil.

2014 Korea EAPSI Scholars

CellScope Inc, a BioE startup, in the New York Times

The CellScope Oto combines an app with an attachment that turns your iPhone into an otoscope. Based on the CellScope pioneered by Professor Dan Fletcher's lab, the Oto is being developed by alumnus Erik Douglas' startup, CellScope, Inc.

Natividad-Diaz wins for cell-sorting

Bioengineering Ph.D. student Sylvia Natividad-Diaz has won second place in the Prize for Primary Healthcare, a CIMIT – Ambulatory Practice of the Future competition. A member of Professor Kevin Healy's lab, she won $100,000 for her promising new approach to cell sorting of blood samples. Her technology requires no electrical power and uses low-cost disposables to establish CD4+ cell counts from small samples. It could help HIV patients of limited resources to manage their medications.

Vlassakis attends Lindau Meeting

Graduate student Julea Vlassakis was selected to participate in the 64th Lindau Nobel Laureate Meeting in Germany. Only the 600 most qualified young researchers from around the world were given the opportunity to share the unique atmosphere of the meetings, attended by 37 Nobel laureates.

Two bioengineers study overseas as EAPSI scholars

BioE Ph.D. students Augusto Tentori and Todd Duncombe, both of Professor Amy Herr's lab, were selected as NSF EAPSI scholars for Summer 2014, allowing them to do research in Korea and Taiwan, respectively.

Our Graduates

B.S.

Summer 2013

Alexander Boehme
Amy Chen
Ritankar Das
Jamie Hum
Mochi Liu
Philip Mansour
Ha Moon
Tracy Nguyen
Tony Zhou

Fall 2013

Nasim Barzanian
Nimmi Bhatt
Bernardo Cervantes
Kimberly Chan
Jackie Chirico
Julie Haduong
Shehzada Jawed
Krishna Kalpathy
Hyungjun Kim
Nisa Kusumo
U Lam
Mengqian Liu
Jared Lucas
Jacob Magid
David Moosavi
Thomas Rich
Yasemin Sarigul-Klijn
Andy Tran

Spring 2014

Niraj Asthana
Norman Bae
Sharyu Barapatrey
Marie Biscarrat
Guangyang Cai
Theodore Chavkin
Dingguo Chen
Emmalyn Chen
Matthew Chen
Robert Chen
Rachel Cheng
Haley Costigan
Andrea Dickey
Neerav Dixit
Matthew Fong
Noah Goldman
Brian Grubbs
Melissa Harrison
Bradley Havens
Jia Yang Ho
Michael Hwang
Akash Jain
Jambu Jambulingam
Seung Jung
Sameer Kabir
Emily Kao
Geonyoung Kim
Andrew Kwong
Ernest Lai
Philip Lee
Ada Li
Eva Li
Shen Li
Brooke Liang
Jacqueline Loo
Albert Lu
Bochao Lu
Peter Mains
Ashwin Marathe
Shilpi Mathrani
Mimin Meliyani
Katherine Mellis
Karim Merchant
Rahul Nayak
Tai Ng
Vicki Ni
Michael Pan
Robin Parrish
Jay Patel
Nathan Poon
Ramya Prathuri
Vikram Ramakrishnan
Andrew Sabour
Harini Sadeeshkumar
Manali Sawant
Sarah Saxton
Michelle Senar
Alexis Seymour
Stephanie Sibert
Elias Sideris
Angus Sidore
Anshum Sood
Daniel Steiner
Yumi Suh
Lila Suleiman
Bei Sun
George Sun
Helen Sun
Adrian Tabula
Richard Tang
Jenkang Tao
Neha Teekappanavar
Michael Ting
Steven Tom
Amanpreet Virk
Vinayak Viswanadham
Jason Wang
Jeremy Whang
Marie Willman
Daniel Wu
Wei Zhuo
Zoya Zulfiqar

Master of Engineering

Spring 2013

Anwaar Al-Zireeni
Michael Chai
Yayun Chen
Po-Jui Chiu
Benson Fan
Jiarong Fu
Hui-Ling Koh
Connor Landgraf
Patrick Lyon
Plat Ngamskulrungroj
Vincent Sheu
Robert Sibilia
Douglas Webster
Jennifer Wong
Zhengda Zhao

Master of Translational Medicine

2013-2014

Stuart Altman
Justin Arnett
Olivia Bigazzi
Pin-i Chen
Shaili Dayal
Kristina Hart
Michael Hemati
Alice Hyun
Stephanie Y Kwan
Kevin Lessard
Naya Loumou
Philip Loury
Teresa Nguyen
Sachin Rangarajan
Zoe Reinsch
Sofia Solar Cafaggi
Patrick Symmonds
Leo Sze
Norman Tse
Andrea Villaroman
Julie Yabu

M.S.

Wei-Yin Chien, Fall 2013
Yun Suk Na, Spring 2014

Ph.D.

Summer 2013

Aaron Daub

Fall 2013

Mohammad Azimi
Daniel Cohen
Laura Croft
Rokhaya Diop
Timothy Downing
Timothy Hsiau
Eric Jabart
Peter Ledochowitsch
Richard Novak
Amy Orsborn
Vimalier Reyes-Ortiz
Rebecca Stoloff

Winter 2013

Serena Scott
Galen Reed

Spring 2014

Lukasz Bugaj
David Chen
Connie Cheung
Ivan Grubisic
Aditya Kohli
Naomi Kort
Benjamin Lee
Christine Leon
Katie Megley
James Pinney
Lane Weaver

BioE students at 2014 commencement. Photo by Matt Beardsley Creative.

BioE Boosters - *the Bates-Pathria Family*

Some of our most important donors aren't philanthropists worth billions—they're people with a connection to our program. Drs. Doug Bates and Mini Pathria are physicians by training who both work as radiologists in San Diego. They're also the parents of two Berkeley Bioengineers, Max (B.S. 2012) and Cameron, and have made regular gifts to our program over the past several years.

In their own words, "bioengineering is a great degree because of its breadth and versatility. The high-level training in science and math combined with a degree in engineering is a great stepping stone into a huge array of careers."

Max originally wanted to be a chef, so his parents said, "You're smart. Get a degree in BioE and apply it to food." Instead, he's joined the Autodesk Bio/Nano/Programmable Matter Group. Cameron planned to be a doctor, but has discovered a love of game theory and its applications and is planning to pursue a Ph.D.

Their decision to become donors was similarly down-to-earth. Both parents attended public schools and universities, are themselves children of public school teachers, and Mini has spent her career at public universities. They believe that donations are essential to the public education system to counter the recent erosion in government support.

"Philanthropy," they've said, "is a way for us all to support the institutions that we think make a difference. We support the goals and mission of UC in furthering affordable education for all students with merit. We need high quality education and to continue to do basic science to succeed and advance."

Bates and Pathria realized that as a relatively new major on campus, their donation would be even more helpful to BioE , as we do not yet have a significant alumni donor base. For Berkeley Bioengineering, gifts such as these are especially meaningful, expressing a vote of confidence from people who know our program well. Many thanks to the Bates-Pathria family for their generous support!

BIGGIVE

One Day. Make it Big. 11.20.2014

You already know about the Big Game. Help Cal really win big during the *Big Give*: 24 hours of giving on November 20. On that day you can join thousands of alumni, students, parents, and friends in showing your passion for Cal and your support for Berkeley students and faculty—and help BioE make a big showing in the leaderboards and hourly contests. More details are at *BigGive.berkeley.edu*.

There are many ways to support BioE. You can give directly to the department by donating through *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.

Alumni - keep in touch!

Join our private **LinkedIn group,**
UC Berkeley Bioengineering Alumni & Students

Like our **Facebook page** at
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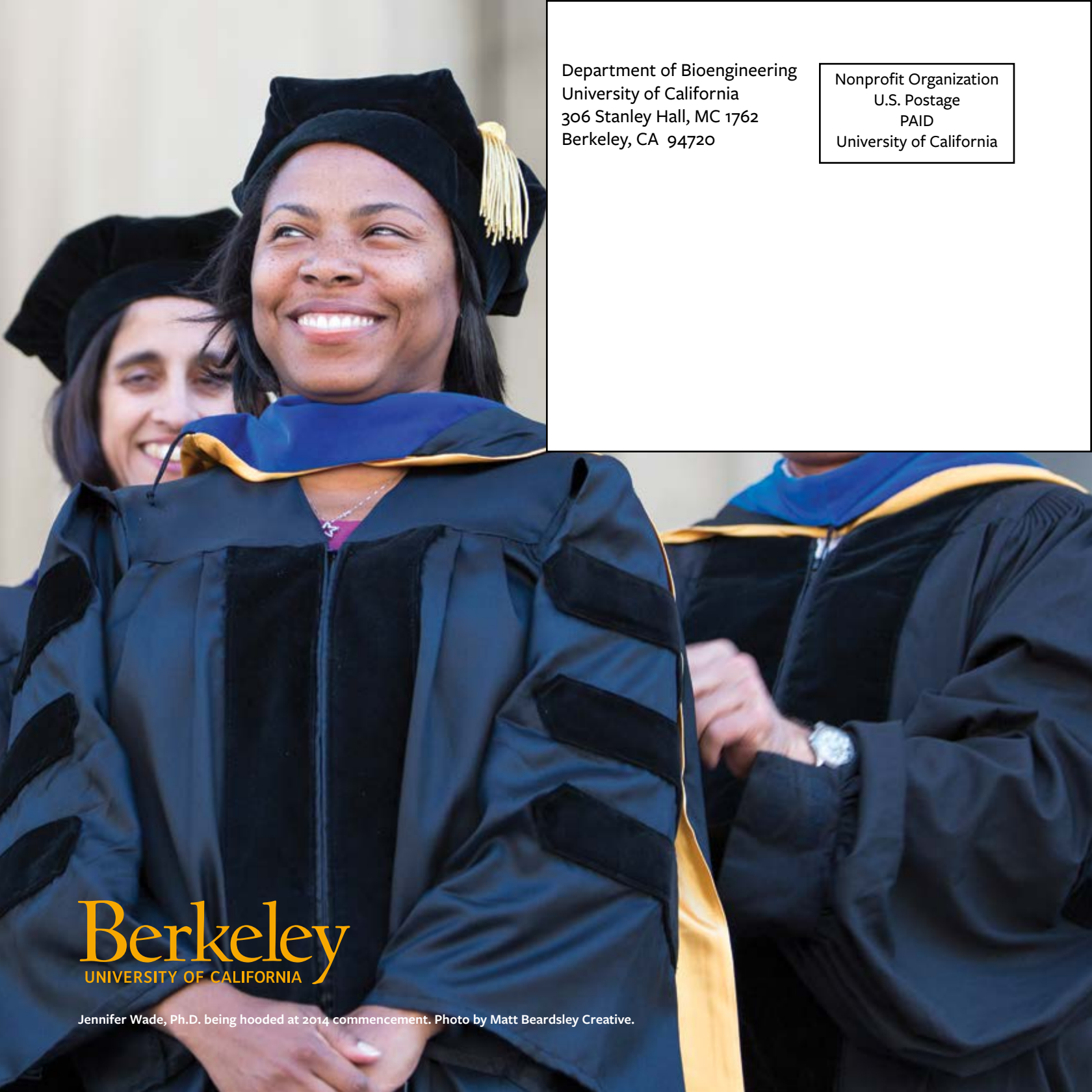

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Jennifer Wade, Ph.D. being hooded at 2014 commencement. Photo by Matt Beardsley Creative.