

UC San Diego

JACOBS SCHOOL OF ENGINEERING
Bioengineering



BIOENGINEERING

Annual Impact Report

2018
2019





BIOENGINEERING

Chair Dr. Kun Zhang



Faculty

Faculty Growth



New Faculty
in 3 years

Faculty In Number



Total Faculty

Research

Funding Growth



Total Faculty

Grant Funding



Total Over
Twelve Months

Academics

Bioengineering



Graduate Rank

Bioinformatics



Graduate Rank

Welcome

"UC San Diego is at the forefront of bioengineering. We broadly categorize our research interests as: Cell and Molecular Bioengineering, Multiscale Bioengineering, Tissue Engineering and Regenerative Medicine, Clinical Bioengineering and Imaging, and Systems Biology and Medicine. Our department has disease focus areas that include Cancer, Cardiovascular Diseases, Metabolic Disorders, Orthopedic Injury, Shock, Multiorgan Failure, and Neurodegenerative Diseases".

Gene-editing pain away

Dr. Ana Moreno / Dr. Prashant Mali



Navega Therapeutics

Now scientists have paired the discovery with the gene-editing tool CRISPR, in what they say is a step toward a gene therapy that could block severe pain caused by diabetes, cancer, or car accidents without the addictive effects of opioids. The new approach to pain eradication was demonstrated in mice in the laboratory of Prashant Mali at the University of California, San Diego. The research was led by Ana Moreno, who is now the CEO of a startup, Navega Therapeutics, which plans to develop a CRISPR treatment for pain. The company has obtained non-dilutive funding from local accelerators and pitch competitions and is currently raising money and continuing to develop this gene therapy for its eventual FDA approval. Navega Therapeutics is currently incubated at JLABS in La Jolla, CA.



Prashant Mali received his undergraduate degree in Electrical Engineering from the Indian Institute of Technology Bombay, and a doctorate in Biomedical Engineering at the Johns Hopkins University. During his postdoctoral fellowship in the Department of Genetics at the Harvard Medical School, he engineered the first implementation of the CRISPR-Cas systems for human genome targeting. He joined the UC San Diego faculty in Fall 2014 as an Assistant Professor in the Department of Bioengineering. Research in his laboratory lies at the interface of basic science and technology development, with one of the core thrusts being development of tools for enabling human gene therapeutics.

Ana Moreno defended her PhD in April of 2019, and is the first PhD student graduating from Dr. Mali's lab. Her thesis focused on developing CRISPR-Cas9 technologies for in vivo genome editing and regulation, and demonstrating their utility in the context of gene therapies. Her thesis resulted in peer-reviewed publications including publications in Molecular Therapy and Nature Biomedical Engineering, multiple patents, and the Engelson PhD Thesis award. After reading about humans that have a mutation in their genome that don't feel any pain, Prashant and Ana decided to utilize a version of CRISPR/Cas9 that does not have nuclease activity, dCas9, to replicate this phenotype by targeting the same gene. Hence, this technology would allow for safe, non-addictive pain relief, as it neither targets an opioid pathway nor creates permanent changes to the genome. Ana indicates: "I come from a very entrepreneurial family, which is common in the Mexican culture. My dad has a real estate business always told me to keep my mind open about starting a company, especially in the field of bioengineering, which can have a large impact on society. This clicked for me when I started working on chronic pain and knowing what an awful effect opioids are having on thousands of patients."

BIOENGINEERING NEW FACES



Kevin King

(PhD: MIT; MD: Harvard Medical School) is a physician-scientist who has been on the faculty since July 2017. His research expertise is in immunology of tissue injury and repair, single cell multi-omics, and development of non-contact adherence-independent sensors for outpatient management of chronic diseases such as heart failure. He also sees patients as an attending cardiologist and is an associate program director of the UCSD cardiology fellowship program. He is a recipient of the 2018 DP2 NIH Director's New Innovator Award and the 2017 R00 NIH Pathway to Independence Award.

Faculty Growth

"Bioengineering is a rapidly growing discipline. Many universities have invested heavily to grow their programs. Under the leadership of our previous chair Dr. Geert Schmid-Schoenbein & myself, and with the strong support by Dean Pisano, we recruited a record number of six top-notch faculty last 3 years, continued to improve our graduate program, and further enhanced our strong partnership with our medical school. We are also the only Bioengineering Department in the country that has three ABET accredited undergraduate majors. I am very pleased that our efforts were well recognized in the survey by US News & Report." - Dr. Kun Zhang (Chair)



Daniela Valdez-Jasso

(PhD: North Carolina State University; postdoc: University of Pittsburgh) has been on the faculty since November 2017. Her research group focuses on soft-tissue vascular and cardiac bio mechanics, and mechanobiology, and multi-scale mathematical modeling of organ and tissue function, particularly as they pertain to understanding the ventricle-vascular adaptationsto pulmonary hypertension PH. Her research laboratory has been funded by an American Heart Association Scientist Development Grant.



Ester J. Kwon

(PhD: University of Washington; postdoc: MIT) has been on the faculty since October 2017. Ester engineers nanoscale materials as medicines for the Brain. She is a recipient of the NIH Director's New Innovator Award in 2018.



Lingyan Shi

(PhD: City College of New York C; postdoc: Institute for Ultrafast Spectroscopy and Lasers at CCNY) 3-year postdoc training at Columbia University Chemistry Department right before joining UCSD Bioengineering. has been on the faculty since July 2019. Dr. Shi is developing and applying new ultrafast laser scanning optical imaging and spectroscopic technologies.



Francisco Contijoch

(PhD: University of Pennsylvania, postdoc: UC San Diego) has been on the faculty since July 2017. Their research expertise is in the development of translational imaging techniques for advanced cardiovascular assesment. They won an NIH NHLBI Career Development award in 2018.



Ludmil Alexandrov

(PhD: University of Cambridge; postdoc: Los Alamos National Lab) has been on the faculty since Jan 2018. The Alexandrov Lab is focused on developing novel computational to map and understand the mutagenic processes that cause cancer.



2019 Inductees into the American Institute for Medical and Biological Engineering:



Pedro Cabrales was recognized for "fundamental contributions to measuring, understanding and modifying microvascular gas transport and physiology in health and disease". Cabrales leads the Functional Cardiovascular Engineering Laboratory at UC San Diego that aims discover and analyze the underlying fundamental regulatory processes in the cardiovascular systems.



Todd Coleman was recognized for "outstanding contributions to physiologic signal processing, scalable manufacturing methods for flexible bioelectronics, and neuroengineering education". Coleman's Neural Interaction Lab pursues several research goals. Most recently, Coleman and colleagues have been working on innovative approaches to non-invasively monitor electrical activity of the digestive system.

The Future of Regenerative Medicine

First FDA clinical trial success of an injectable hydrogel to restore cardiac function



Karen Christman

Dr. Karen Christman's research group at the Jacobs School of Engineering focuses on developing innovative biomaterials for tissue engineering and regenerative medicine applications.

Dr. Christman is also co-founder of Ventrix, Inc., which is in clinical trials with the cardiac extracellular matrix hydrogel technology developed in her lab at UC San Diego.

Ventrix, Inc.

Ventrix, Dr. Christman's spin-off company, has successfully conducted a first-in-human, FDA-approved Phase 1 clinical trial of an injectable hydrogel that aims to repair damage and restore cardiac function in heart failure patients who previously suffered a heart attack.

The trial is the first to test a hydrogel designed to repair cardiac tissue. It is also the first to test a hydrogel made from the natural scaffolding of cardiac muscle tissue, also known as extracellular matrix, or ECM. This is significant because ECM hydrogels have been shown in preclinical studies to potentially be effective for other conditions, such as poor blood circulation due to peripheral artery disease.

The trial showed that the hydrogel, known as VentrGel, can be safely injected via catheter into patients who had suffered a heart attack in the past 2 to 36 months.

Christman provided a perspective in the January 24, 2019 issue of *Science*



Faculty Leading Large Initiatives

Rob Knight wins 2019 NIH Pioneer Award



Rob Knight

Rob Knight, PhD, was one of 11 nation-wide to be awarded the Pioneer Award, the top honor of the NIH's High-Risk, High-Reward Research Program, to support his research in developing new approaches to support healthy microbiomes. Knight is a Professor of Bioengineering and Computer Science & Engineering in the Jacobs School of Engineering, Professor of Pediatrics in the UC San Diego School of Medicine, and Director of the UC San Diego Center for Microbiome Innovation. His work is focused on understanding the multitude of ways in which microbes affect our daily lives, from their presence in and on our bodies and how they are involved with disease to how they play roles in diverse ecosystems around the world.

His lab uses advanced DNA sequencing and computational techniques to analyze and understand microbial communities. With funding from the Pioneer Award, Knight will work on new, integrative approaches for studying how the gut microbiome can be optimized to help prevent and treat infections. Changes in microbial activity in the gut can impact organs throughout the body, with dramatic health effects. Knight plans to develop methods for mapping the interactions between dietary inputs, gut bacteria and immune response to better understand how diet influences immune system function, generating new opportunities for promoting a healthy microbiome and treating infections.

Subramaniam wins \$12M NIH Metabolomics Workbench grant

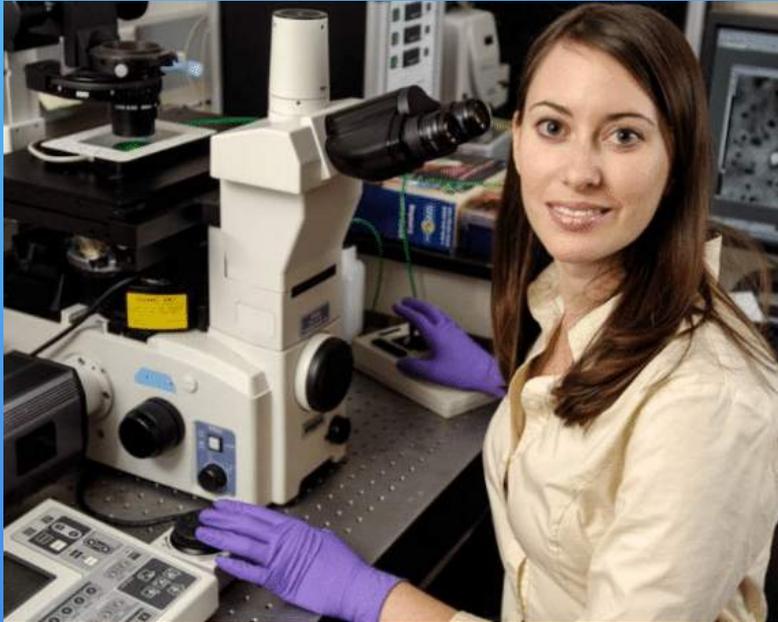


Shankar Subramaniam

In the Fall of 2018, UCSD received a \$12 million, four-year grant from the NIH to expand the Metabolomics Workbench, a searchable, interactive repository of data for all research in the field of metabolomics—the study of the small molecules called metabolites that are found within cells and biological systems. The Metabolomics Workbench project, led by bioengineering professor Shankar Subramaniam at the Jacobs School of Engineering at UC San Diego, launched in 2012 with a \$6 million grant from the NIH. This new infusion of funds will allow Subramaniam and colleagues to add a wide range of clinical data to the Workbench and take the project into the clinic itself. This in turn will allow researchers and physicians to develop better tools to diagnose diseases through metabolite markers in blood. “Blood is our first window into human physiology,” said Subramaniam, who is the Joan and Irwin Jacobs Professor of Bioengineering and Systems Biology at UC San Diego.

Faculty Leading Large Initiatives

Fraley Using Machine Learning and High Resolution Melt to Save Neonates from Pathogens

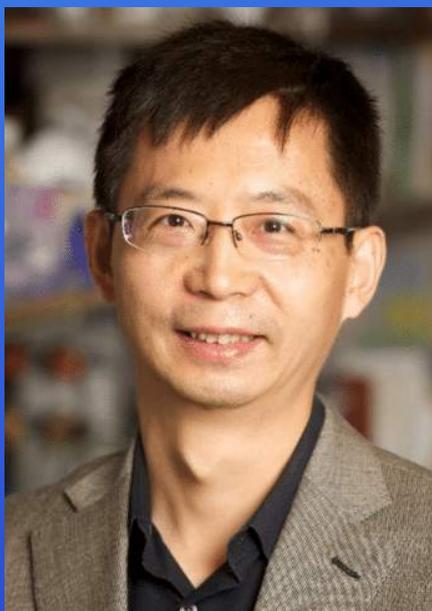


Stephanie Fraley

Stephanie Fraley, Assistant Professor of Bioengineering, secured NIH R01 funding in summer 2018, to advance approaches in rapidly screening for pathogens in newborn blood. The project she leads, titled "Digital High Resolution Melt and Machine Learning for Rapid and Specific Diagnosis in Neonatal Sepsis", is a close collaboration with engineers and neonatologists at the UCSD Jacobs Medical Center. The novel approach Dr. Fraley is leading involves Digital High Resolution Melting (dHRM) of DNA combined with machine learning to create unique "fingerprints" for microbes and antibiotic resistance, allowing for faster and more precise detection and treatment of pathogen(s) causing sepsis.

These efforts will advance and test the clinical performance of dHRM technology in the diagnosis of neonatal sepsis. The long term vision of this project is to rapidly and accurately identify pathogens and their resistance markers to facilitate accurate antimicrobial therapy, reducing antibiotic overuse in non-infected infants. These efforts have been spun out into a startup company, Melio Labs, Inc, which recently won an NIH Small Business grant and is led by Mridu Sinha, PhD, who did her PhD in Bioengineering at UCSD Bioengineering and won the Engelson PhD thesis award in Bioengineering.

Zhang awarded \$14 million from NIH to build 3D digital maps of human organs with single-cell resolution



Kun Zhang

In the Fall of 2018, Kun Zhang, Professor and Chair of Bioengineering at UCSD, secured \$14 million in grants from a pair of NIH grants. "We're building so-called 'reference maps' for these organs. For example, if a patient has Alzheimer's or chronic kidney disease, we can zoom in and examine what's happening at the level of individual cells and compare it to the reference map of a normal brain or kidney. This could help us identify biomarkers and better clinical decisions on what treatments to use," said Zhang. One of the projects, awarded \$8.7 million over five years from the NIH BRAIN Initiative, is aimed at building a 3D single-cell map for the entire human brain. Our ultimate goal is to produce a complete cell atlas of the human brain, including a full catalog of all cell types (a 'parts list') and their spatial organization," Zhang said. "This is a critical step towards understanding the human cognitive machine." The new project expands upon Zhang and colleagues' previous work on mapping diverse populations of neurons in several regions of the brain. It began with a study published in Science that identified 16 neuronal subtypes in six areas of the cerebral cortex. That study was the first large-scale mapping of gene activity in the human brain and provided a basis for understanding the diversity of individual brain cells.

Zhang and colleagues will also apply these single-cell sequencing and imaging techniques to build reference maps for organs in the respiratory and urinary systems, including the lungs, kidneys, bladder and ureter. This project was awarded \$5.3 million over four years from the NIH's Human BioMolecular Atlas Program (HuBMAP). It is part of a larger research community effort called the Human Cell Atlas, which aims to "map the adult human body at the level of individual cells."

Faculty Leading Large Initiatives

Hasty Pioneers Synthetic Biology to Engineer Solutions that Improve Society



Jeff Hasty

Jeff Hasty, Professor of Bioengineering and Molecular Biology at UC San Diego, is a pioneer and leader in synthetic biology. His studies represent a body of work that has had a tremendous impact on the development of the field of synthetic biology. Cells and DNA constructs from his lab are used by scientists and engineers around the world in efforts to build upon his development of logical programming at the colony level. In the broader context of the revolution in biology towards quantitative methods, he has pioneered a methodology for the deduction, analysis and experimental validation of model equations that describe gene regulation and cellular signaling. This has provided inspiration for many theoretical and computational scientists with interests in biology. He led a September 6, 2019 article in *Science* titled "Rock-paper-scissors: Engineered population dynamics increase genetic stability".

Dr. Hasty has effectively transitioned his research to 'big idea' applications with a focus on the human condition through the formation of two companies based on his gene circuit technologies. He has made a substantial effort to diversify his funding sources in order to avoid an over-reliance on the traditional NIH/NSF mechanisms for basic science. This has led to grants in excess of \$4M from DoD sources, which support his work on water treatment, biosensors, and in-vitro expression systems. Quantitative BioSciences focuses on environmental water sensing and remediation, and GenCirq Inc is developing a cancer therapeutic. Hasty firmly believes that synthetic biologists should engineer solutions that will improve society.

Metallo Co-Leads Study Published in New England Journal of Medicine



Christian Metallo

Christian Metallo, Associate Professor of Bioengineering, applies systems biology methods to study metabolic pathways in mammalian cells. He has secured funding from the NIH and Lowy Medical Research Foundation to study alterations in amino acid and lipid metabolism in cancer and macular disease. The laboratory recently discovered the molecular cause of a debilitating eye disease called Macular Telangiectasia. The lab co-led a study recently published in the *New England Journal of Medicine*, which describes how genetics and environment converge to drive production of a toxic, disease-causing lipid.

Current projects in the Metallo Lab include investigations on the regulation and function of reductive tricarboxylic acid (TCA) metabolism in human cells, the role of hypoxia and extracellular matrix in reprogramming metabolic pathways, and the dynamic interplay between metabolism and stem cell fate choices.

Meet the Board of Trustees

We are very proud to have created a Board of Trustees in 2016 for the Department of Bioengineering at UC San Diego. The Board of Trustees advises the Department on every aspect of its mission. As an example, the Board actively collects opinions from alumni who give independent opinions about how the department can improve. The Board has recently raised over \$100K to provide fellowships for talented and needy M.S. degree students.

Walt Baxter, Ph.D. - Chair - Senior Principal Scientist at Medtronic Neuromodulation



Dr. Baxter is a Senior Principal Scientist in Medtronic's Implantables Restorative Therapies business group. He has patented key ideas and published seminal works detailing the mechanical conditions implanted medical devices are exposed to during their lifetimes and is a Bakken Fellow, Medtronic's highest technical honor. Dr. Baxter earned a Ph.D. at UC San Diego where he developed, implemented, and validated novel algorithms for elucidating the mechanics of implanted medical devices.

Ann Lee-Karlon, Ph.D. - Senior VP of Portfolio Management and Operations at Genentech



Dr. Lee-Karlon leads Portfolio Management and Operations with oversight for over 30 drug development teams in the Genentech pipeline. She also serves as President and Board Chair for the Genentech Patient Foundation, which provides medicines to uninsured or underinsured patients. She was elected President and Board Chair of the Association for Women in Science (AWIS) for 2014-2016 and has been invited to address United Nations forum. She was honored as one of the Remarkable Women of the University of California by the UC President's Office and is a Fellow of the American Institute for Medical and Biological Engineering.

Christophe Schilling, Ph.D - CEO at GenomaticaEx Officio



Christophe founded Genomatica in 1998. Since being named CEO in May 2009, he has led Genomatica to widespread recognition as a leader in industrial biotech, with a commercialized first process and plant and multiple leading partners. The company has earned awards for industry impact (recognized in ICIS Top40 Power Players five years in a row), engineering (Kirkpatrick), science (EPA Presidential Green Chemistry), industry leadership (voted #1 Hottest four years in a row by Biofuels Digest), and company culture (The Scientist as a Best Place to Work). Christophe has previously served on the World Economic Forum Global Agenda Council on Biotechnology and is a member of YPO, an international leadership organization for chief executives. Christophe holds a Ph.D. in bioengineering from the UC San Diego and was honored as a Distinguished Young Alumnus in 2010.



Paul Citron, Ph.D - Vice President of Technology Policy and Academic Relations, Emeritus at Medtronic

Paul Citron retired in 2003 from Medtronic, Inc., a pioneer in the medical device industry and the largest developer of implantable therapeutic devices. He was Vice President of Technology Policy and Academic Relations. Previously he was Medtronic's Vice President of Science and Technology for over 15 years, responsible for corporate-wide assessment and coordination of technology initiatives and for prioritization and funding of corporate research. He has authored numerous medical technology peer reviewed publications and has been an invited speaker at biomedical engineering conferences, workshops, symposia, and university classrooms. Citron holds nine U.S. medical device patents, including one that was designated "Patent of Distinction" by Medtronic for its positive impact on patient wellbeing.



Erik Engelson, Ph.D - President & CEO of Lucira Health, Inc

Mr. Engelson, is currently President & CEO of Lucira Health, Inc, a member of the Board of Neptune Medical and ARANZ Medical, and is a Venture Partner at ShangBay Capital. Just prior to this, he was CEO of Medina Medical, which was sold to Medtronic. Previous associations include Partner at The Foundry (a venture-funded medical device incubator), CEO of two Foundry companies, CFO of Fluidigm Corporation, and Venture Partner at both Versant Ventures and Institutional Venture Partners. Earlier, Mr. Engelson spent 13 years in various operating roles at Target Therapeutics where he led the early start-up into the then nascent field of Interventional Neuroradiology (stroke intervention), developed its first products and helped take the company public. He holds a PhD in Bioengineering from UC San Diego.



Joseph Lucisano, Ph.D. - President at Lucisano Consulting, LLC

Joseph Lucisano, PhD, has deep experience in medical device research, product development, regulatory navigation, clinical affairs, and business strategy and operations. Dr. Lucisano's background in medical devices includes a long-standing focus in medical sensors, and he is a recognized scientific expert in the field of implantable monitoring devices. His past service in medtech organizations includes roles such as Bioengineer, Scientist, Principal Engineer, Program Director, CTO, Founder/President/CEO, and Board Member. He is currently President of Lucisano Consulting, LLC, which delivers medical device R&D and business expertise to clients in the medical and health technology field. Dr. Lucisano holds PhD and BS degrees in Bioengineering from the University of California, San Diego. He is an inventor on 21 US patents and has served as Principal Investigator for numerous peer-reviewed focused R&D grant projects related to medical devices.

Academic Excellence

Five UC San Diego Bioengineering graduate students honored as Siebel Scholars



Top row: Yiqian "Shirley" Wu, Martin Spang, Pranjali Beri; Bottom row: Vishwajith Ramesh, and Xin Fang

San Diego, Calif., September 25, 2019 --Five UC San Diego bioengineering graduate students working at the interface of biology, engineering and health have been honored as 2020 Siebel Scholars. Their research offers a glimpse into the depth and breadth of UC San Diego's world-renowned bioengineering graduate program. They are working to deepen our understanding of the gut microbiome; more accurately diagnose diseases like stroke; develop biomarkers for metastasis; innovate to repair the heart after a heart attack; and engineer T cells to suppress tumor growth.

This year, all five Siebel Scholars from UC San Diego are graduate students in the Department of Bioengineering, which was ranked 5th in the nation by U.S. News this year.

"I'm honored to congratulate each of these outstanding individuals. In addition to emerging as bold, world-class researchers who will improve human health, they are all proven leaders who share their time and expertise in the service of others. At the Jacobs School of Engineering, we pursue engineering for the public good," said Albert P. Pisano, Dean of the Jacobs School of Engineering.

The Siebel Scholars program recognizes the most talented students in the world's leading graduate schools of business, computer science, bioengineering and energy science. The students are selected based on outstanding academic performance and leadership, and each receive a \$35,000 award toward their final year of study.

Undergraduate Student Spotlight: Varun Govil

UC San Diego
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“It’s critical to learn how to go from an idea to a business, and combining diverse perspectives from engineering, medicine, and business make that a reality.”

Out of 343 teams, the 2018 UC San Diego iGEM Team won 2nd place overall in the undergraduate track, UC San Diego's first finalist seeding in school and iGEM history. The team won best overall diagnostics project, won the following Special Track prizes: Best Education and Public Engagement, Best Entrepreneurship, Best Poster, and additional top 5 nominations in Best Integrated Human Practices and Best Wiki. These were the first times that UC San Diego has won any special awards or even been nominated for them.

Research

Govil led the 2018 iGEM team which developed a liquid biopsy cancer diagnostic tool called Epinoma using an epigenetic-based paradigm. It aims to relieve the pain patients may experience from tissue biopsy and lower the cost of surgical intervention.

Entrepreneurship

Govil has furthered his interest in the healthcare domain by serving as president of Blue LINC, UCSD's first healthcare incubator for undergrads, grads, and postdocs. The mission of Blue Linc is to connect brilliant graduate students with engineering, medical, business, and design backgrounds to propel advances in healthcare

Outreach

Govil was also named a prestigious Donald A. Strauss Foundation Public Service Scholar from his work developing synthetic biology outreach initiatives for empowering underrepresented minority high school students to do scientific research. The project combines insights he learned from iGEM with VR technology.

Recent Alumni



BMES Executive Board 2017-2018

For 2 years, Shoun Matsuka served as a Project Team Co-Lead in the Biomedical Engineering Society where he led a committee and assisted more than 40 undergraduate members to join technical projects across campus, including a startup. Currently, Matsuka works full-time as a development engineer under NuVasive's R&D department.



Featured Alumnus: Niranjanaa Jeeva

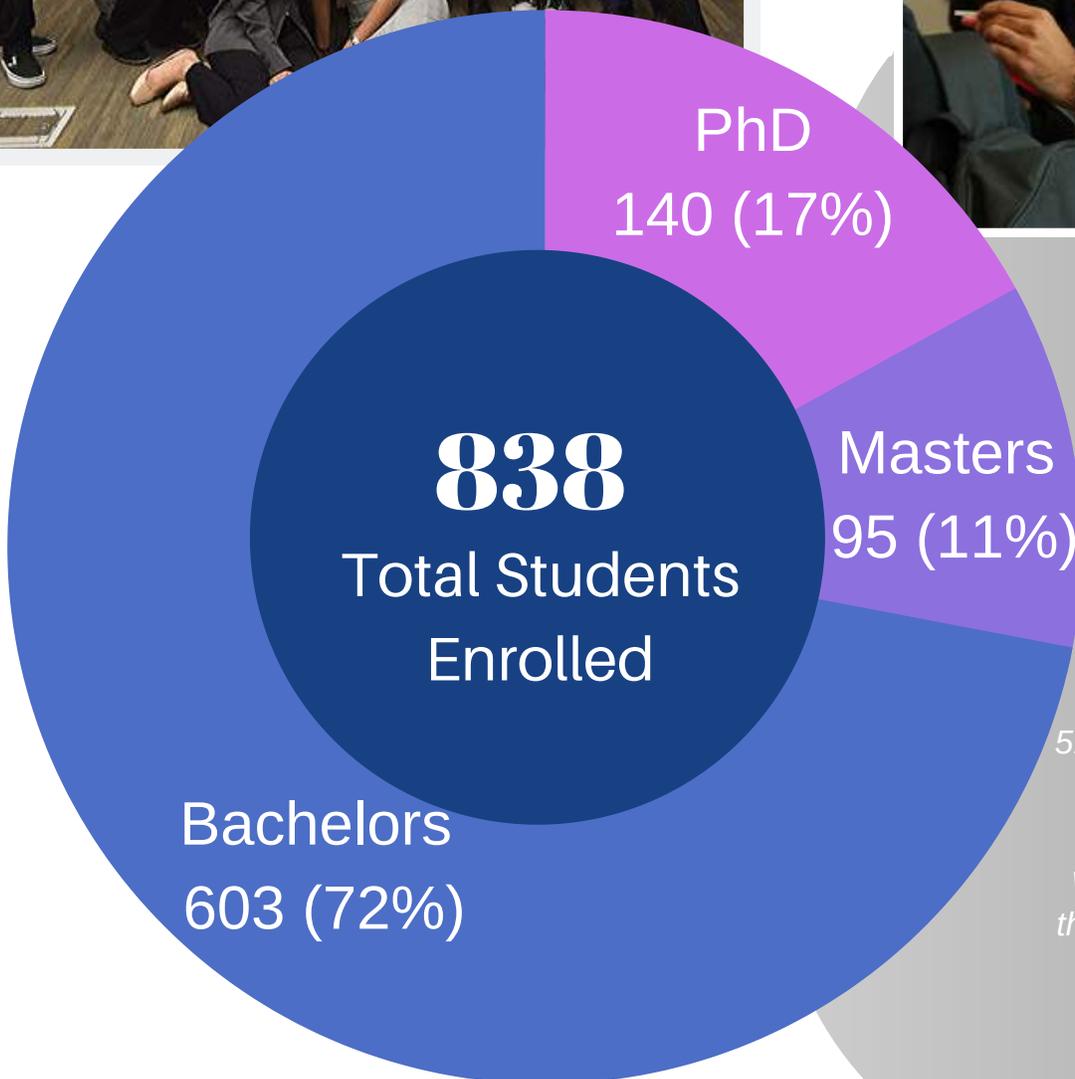
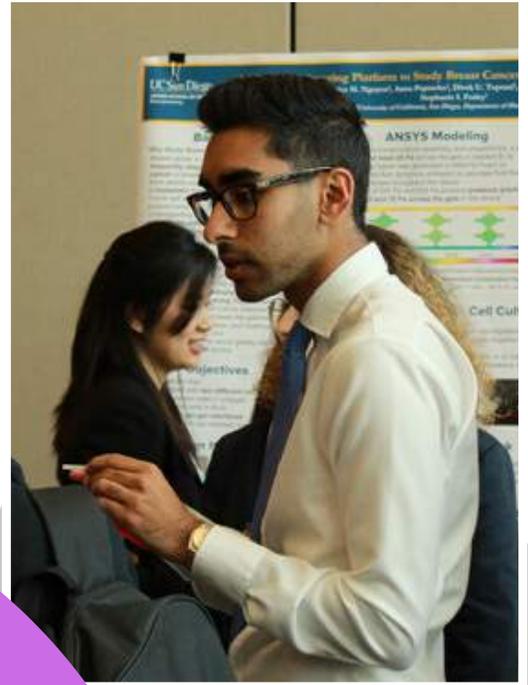


Niranjanaa Jeeva strives to address issues of health disparity by developing technologies that make medical care lower cost, easier to use, and more accessible to patients globally. During her time at UC San Diego, she was heavily involved with on-campus organizations, acting as a Gordon Scholar and president of Engineering World Health.

She also co-chaired the coordination of the 2017 UC Health Hack, a two-day hack-a-thon in which over 200 participants developed innovative solutions to pressing healthcare needs. Along with two other classmates, she worked on developing an intervention to assist mothers with postpartum emotional challenges in better bonding with their infants. Through this project, she took part in several student entrepreneurship efforts on campus.

Jeeva is currently pursuing an MSE in Bioengineering Innovation and Design at Johns Hopkins University and is working on a project partnered with the Aravind Eye Care System to address issues of inequity in vision care in Southern India.

Student Breakdown

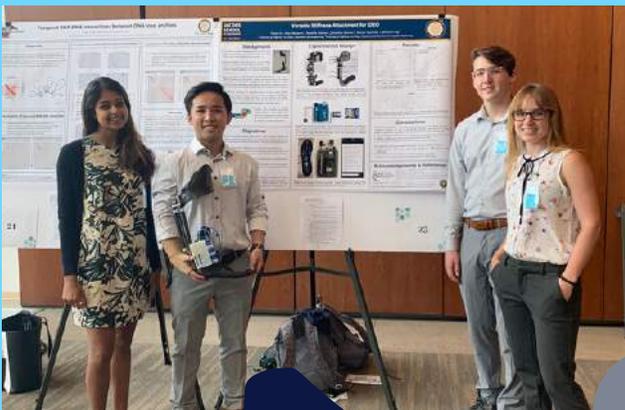


51% of Bachelors degrees in Bioengineering at UCSD are given to women, as compared to the 38% national average

Bioengineering Day



Featured Project



What is BE day?

Bioengineering Day is run entirely by bioengineering undergraduates. It serves to celebrate UC San Diego's consistently top ranked bioengineering department, the current research by students, and the overall burgeoning field itself. The day-long event features various speakers, senior design project presentations, research seminars, and networking sessions. It is attended by well over 400 people each year, and is a great opportunity for undergraduates, graduate students, faculty, and members from industry to form valuable connections with one another.

"Passive Dynamic AF'O"

Eugene H. Mead Memorial Award for engineering excellence
This study explored a new design to vary IDEO (intrepid dynamic exoskeletal orthosis) stiffness in order to assist users in different activities such as walking, running, and climbing stairs.

Innovation in the Classroom

Clinical Bioengineering

In this course, led by Adam Engler, undergraduate students act as "engineering consultants" for physicians at Rady Children's Hospital and UC San Diego Health System. Students rotate across clinical disciplines to identify engineering solutions to relevant clinical problems.

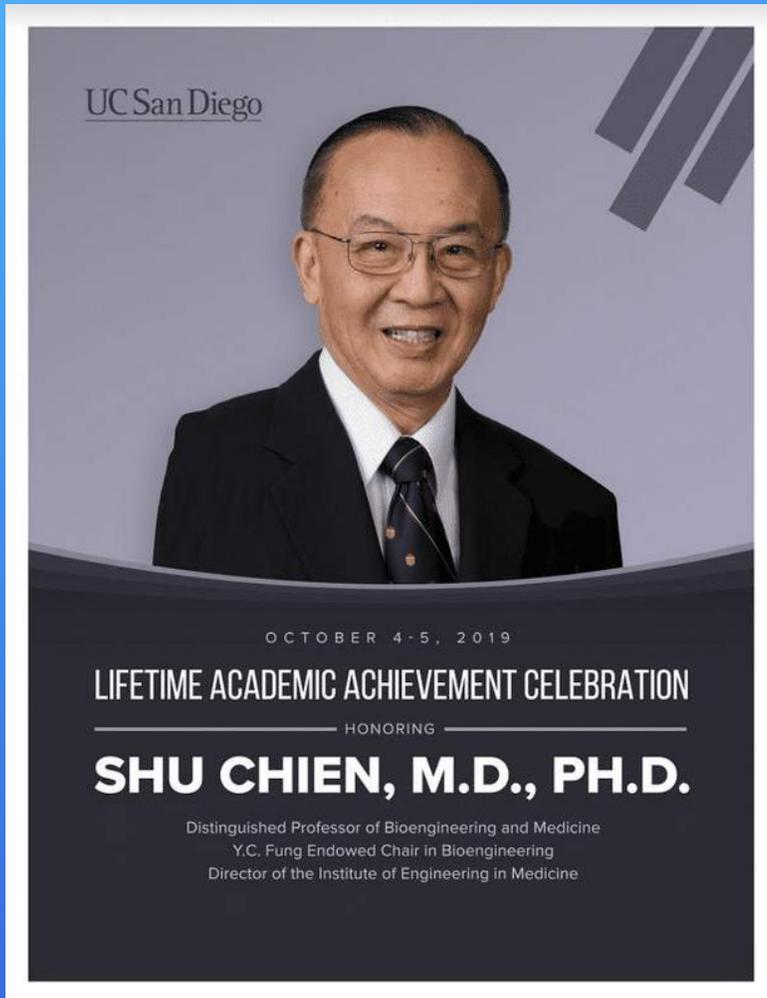


Master of Science: Medical Specialization

This one-year program will prepare engineering students for careers in the biomedical industry, or bolster students' clinical exposure in preparation for medical school. A key component of the program is an experiential three-quarter capstone sequence—clinical reasoning, patient interaction and clinical experience—in which students learn about clinical trials, writing an Institutional Review Board application, how to interview patients, and the terminology used in clinical settings. Students also get hands-on clinical experience, shadowing doctors with the goal of identifying an actionable problem and going through the process of devising technical solutions.

Dr. Shu Chien

Lifetime Academic Achievement Celebration



“Shu is able to foresee key directions in science, medicine, and engineering well before they become apparent to many of us.” – Irwin Jacobs, founder of Qualcomm

Dr. Shu Chien has been a part of the UC San Diego community since 1988 when he joined the bioengineering program. As the founding chair of the Department of Bioengineering, Dr. Chien has played a major role in establishing UC San Diego's bioengineering program as one of the top programs in the country. In 2008, he became the founding director of the Institute of Engineering in Medicine (IEM), an initiative that synergizes UC San Diego's unique strengths in engineering and medicine. He also established the UC Systemwide Bioengineering Institute of California (BIC), which facilitates cross-collaboration in research and training among the ten UC campuses.

Dr. Chien's ability to see the value of collaboration extends to his interactions and relationships with donors. He helps donors understand why bringing engineering and medicine together is so important, and he offers them opportunities to make a significant impact on people's health and well-being. UC San Diego Foundation Trustee Drew Senyei notes that, “The combination of engineering and medicine have produced numerous advances in health care that would not have been possible without his tenacity.” As the faculty lead for the Siebel Scholars Program, Dr. Chien maintains strong relationships with both scholars and alumni, is active in the stewardship of the Siebel Scholars Foundation, and oversees the administration of the \$2 million grant. To date, 50 talented PhD students have joined the prestigious group recognized for academic excellence and leadership achievement.

Dr. Yuan-Cheng Fung

100th Birthday Celebration



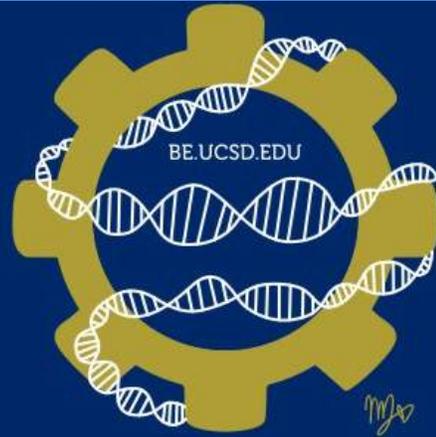
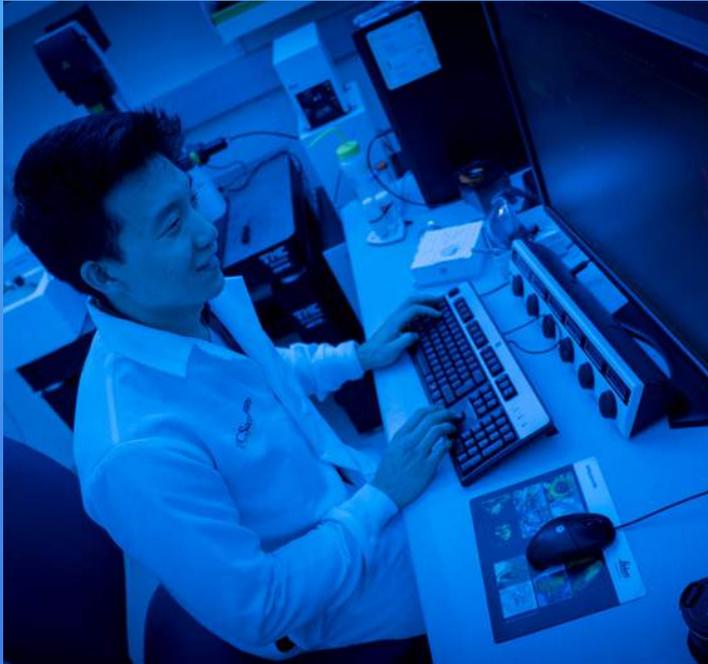
San Diego, Calif., October 3, 2019 -- Thousands of professors, engineers, scientists and students around the world work in the field of biomechanics, the study of physics and mechanics applied to living tissues. But they are all somehow connected to Professor Y.C. “Bert” Fung at the University of California San Diego. Some use Fung’s findings in their work. Others were trained by or worked with Fung’s students. A core group studied directly under him. Fung realized that physics and mechanics apply to living tissues just as they do to manmade structures. He is often referred to as “the father of biomechanics.” On Sept. 21, more than a hundred researchers from as far as Israel, Taiwan, Singapore and China came together at UC San Diego to celebrate Fung’s 100th birthday. The celebration was held in the Fung Auditorium—a nod to the key role Fung played here on campus.

He is one of the founders of bioengineering at UC San Diego, which is ranked No. 1 in the nation by the National Research Council at the National Academies. The department also has been ranked in the top five in the United States since the discipline was first ranked. Fung received a National Medal of Science in 2000, the first bioengineer to earn the distinction. He also was the fourth individual in history elected into all three branches of the National Academies. But of all the accolades he received, Fung’s favorite was the Founders Award he received from the National Academy of Engineering in 1998, because it was bestowed by his peers, according to his son Conrad. In addition to his scholarship and kindness, Fung’s laugh is one of his most distinctive qualities, according to his colleagues. “He is the most joyful individual,” said Geert Schmid-Schoenbein, professor of bioengineering at UC San Diego, one of Fung’s former Ph.D. students and a key organizer of the 100th birthday celebration. “When you step into a building, you can tell where he is just by the sound of his laughter.”

UC San Diego

JACOBS SCHOOL OF ENGINEERING
Bioengineering

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