Dear Colleagues,

As the new academic year commences, I am pleased to report that, despite some losses, the campus continues to grow its bioengineering community at a rapid rate. The loss was Kimberly Foster, Associate Director of CBE and a valued colleague in Mechanical Engineering who left us to take the helm as Dean of Engineering at Tulane University. Her contributions to our campus were many, and she will be missed. I, for one, will miss her unflagging enthusiasm and energy, which makes her a hard act to follow. However, with losses come gains - Beth Pruitt joined Mechanical Engineering and BMSE this spring from Stanford, and kindly took over as the Center’s Associate Director, and I am happy to report is cast from a similarly creative, energetic, and enthusiastic mold as our previous Associate Director.

Beth is by no means the campus’ only new hire in BioE. This Fall alone, the following colleagues are joining us: Spencer Smith, a neuroengineer, is joining ECE; Max Wilson and Enoch Yeung, both experimental systems biologists, are joining MCDB and Mechanical Engineering, respectively; and Angelia Pitenis, who works on tissue mechanobiology is joining Materials Science. Spencer and Enoch, along with Beth are joining us in the BioEngineering Building, but there is plenty of space left for new hires as well, and several additional departments are conducting bioengineering-oriented faculty searches this fall quarter. Exciting times.

ABOUT CBE

The Center for BioEngineering at UCSB is a hub for research and teaching at the interface of biology, engineering, and physical sciences. It builds on UC Santa Barbara’s interdisciplinary strengths in biophysics, biomaterials, biomolecular discovery, and computational and experimental systems biology, enabling fundamental scientific discoveries to be transitioned to application in medicine and biotechnology. For more details about research, academic offerings, and a list of CBE faculty visit: www.bioengineering.ucsb.edu

ABOUT THE OPTIONAL PH.D. BIOENGINEERING EMPHASIS

The optional Ph.D. BioEngineering Emphasis is open to all doctoral students interested in bioengineering who are already enrolled at UCSB in one of the participating engineering or science departments or programs (see CBE website for details). The BioEngineering Emphasis includes a structured curriculum, the ENGR 220ABC series, aimed at teaching bioengineering at several levels (molecular, cellular, and tissue/systems), as well as an invited faculty research seminar series (ENGR 225) and a student-run seminar series (ENGR 230). For more information about the emphasis and admission process, or to find out about upcoming CBE seminars, contact Angelina Toporov, CBE Student Affairs Officer at atoporov@engineering.ucsb.edu
Q & A with Beth Pruitt, Ph.D.
Associate Director, Center for BioEngineering

Our new CBE Associate Director, Beth Pruitt, Ph.D., Professor of Mechanical Engineering, Biomolecular Science and Engineering (BMSE), and Molecular Cellular & Developmental Biology (MCDB) shares her vision of CBE’s future and much more in this Q & A.

**What do you hope to accomplish as the Associate Director of CBE?** There are a lot of great synergies in bioengineering across the 13 CBE affiliated departments and programs and my hope is that we can craft a unified roadmap for how students in these departments can create interlocking paths with CBE to earn degrees with specialization in bioengineering. By articulating how these programs differ in their requirements but also complement student interest in bioengineering, we can continue to attract the best students, postdocs, staff, and faculty to train and do research in bioengineering at UCSB.

**What is your Vision for the Center for BioEngineering?** With my CBE Colleagues, I hope to identify the resources and develop a blueprint for the emerging bioengineering degree programs and department.

**What are your research interests?** I am interested in multi-scale mechanobiology and creating better instrumentation and platforms to mechanically manipulate and measure responses of biological cells and organisms. With our tools we are answering questions of the role of mechanics in how life maintains and builds itself, by understanding what goes wrong when mechanical environments change with aging or disease, we can help develop and validate therapeutic targets.

**What inspired you to become a Bioengineer?** I came to bioengineering through a background in mechanical engineering and microsystems doing micromechanics measurements and modeling, but I found the needs for quantifying mechanics in biological questions to be most compelling for the applicability to human health and the chance to learn something new every day!

**What are some awards and recognitions have you received and would like to share?** I am most proud to be elected by my esteemed peers as a Fellow of both the American Institute of Medical and Biological Engineers and the American Society of Mechanical Engineers for my work developing microtechnology and measurement systems to interface with and observe biological processes.

**What are your greatest accomplishments so far?** My lab has been very active and open in publishing and sharing our technology software and design algorithms with the community. I get the biggest kick out of going to a conference and seeing the great research that others have been able to do by applying our methods and codes to their own work. I think the greatest impact is to have the kind of multiplicative effect where we not only do great sciences but enable great science.

**What would you say to someone interested in Bioengineering?** Traditional engineering fields do a great job in training fundamentals, analysis and problem solving where there is often a right or best answer. Biological disciplines do a great job training in critical thinking to test hypotheses about how cells, tissues and organisms build themselves, maintain themselves, function, and fail and also building testable models from a minute subset of observable parameters. Bioengineering challenges us not only to think both ways but to develop new approaches and technologies to make more of biology accessible and observable and to enable and test systems level engineering modeling.
2018 Annual Mellichamp Chair Lecture
presented by Professor Michael B. Elowitz

The 2018 Duncan and Suzanne Mellichamp Chair Lecture in Systems Biology and Bioengineering was presented by Professor Michael B. Elowitz on April 23, 2018 at Mosher Alumni House at UCSB. Dr. Elowitz is a Professor of Biology and Bioengineering at the California Institute of Technology, an Investigator at Howard Hughes Medical Institute and Executive Officer for Biological Engineering.

In Professor Elowitz’s presentation entitled, Communication and Computation in Mammalian Cells, he discussed new work showing how natural and synthetic protein circuits provide computational capabilities to mammalian cells. His talk was about how circuits of interacting proteins provide key functions in living cells. His research group has been developing a “build-to-understand” approach using synthetic biology approaches. One focus was on computations that allow cells to respond to different ligand environments or recognize distinct messages from other cells.

The Elowitz Lab is interested in how genetic circuits, composed of interacting genes and proteins, enable individual cells to respond to signal and environmental conditions, make decisions, and communicate to each other. They make time-lapse movies to quantitatively observe dynamics of natural and synthetic genetic circuits in individual cells.

Professor Elowitz has garnered a robust list of publications, awards, and achievements in his career including being named in the Technology Review’s 100 List of Top Innovators (2004), the MacArthur Fellow Program, MacArthur Fellowship “Genius Award” for work in systems biology (2007), Presidential Early Career Award in Science and Engineering (2008), Discover Magazine’s Top 20 under 40 (2008), HFSP Naksone Award (2011), and elected to the American Academy of the Arts and Sciences (2015).

2018 Santa Barbara & Goleta Biotechnology Industry Showcase

The 2018 Santa Barbara & Goleta Biotechnology Industry Showcase event was on Friday May 18, 2018 in Elings Hall at UCSB and was sponsored by the Center for BioEngineering, Bioengineering Student Seminar Series (230) and CNSI Center for Scientific and Engineering Partnerships with support from SEED-SB, Career Services, Office of Technology & Industry Alliances, and Graduate Division. This event brought together graduate students, as well as postdoctoral and faculty researchers at UCSB with 14 local biotechnology companies for a day of industry highlight talks, panel discussions, networking opportunities, and a closing reception.

The keynote speaker, Diego Rey, Ph.D., Visiting Partner with Y Combinator, presented his talk, The Applications Layer of Biology. Y Combinator is a startup accelerator that has funded over 1,588 startups since 2005 with a combined market capitalization of $80 billion. Dr. Rey is a UCSB Alumnus and received his B.S. in Electrical Engineering from UC Santa Barbara in 2004 before he went on to Cornell University where he earned his MS and PhD in Biomedical Engineering.

This event was a success thanks to the steering committee, a team of dedicated bioengineering students including Alexandra Downs, Carlos Gomez, Jeff Hall, Dennis Joshy, Chad Wangsanuwat and the Bioengineering Professional Development Advisors, Dr. Adele Doyle (CBE & NRI) and Dr. Arica Lubin (CNSI CSEP).
Welcome New CBE Faculty

Beth Pruitt, Ph.D., Professor in Mechanical Engineering, Biomolecular Science and Engineering (BMSE), and Molecular, Cellular & Developmental Biology (MCDB), and CBE Associate Director joined UCSB and CBE in Spring 2018 and will start in Fall 2018. Professor Pruitt received her BS from MIT in Mechanical Engineering, MSc from Stanford University in Manufacturing Systems, and a PhD in Mechanical Engineering from Stanford University where she went on to become a professor in the Department of Mechanical Engineering in 2003. Her office and lab space are in the new BioEngineering building. (See Beth Pruitt’s Interview on page 2).

Siddharth Dey, Ph.D., Assistant Professor in Chemical Engineering joined UCSB and CBE in Spring 2017. He received his B.S. in Chemical Engineering from Institute of Chemical Technology (formerly: UDCT), in Mumbai, India. He was ranked 2nd out of 76 students. He went on to receive a Ph.D. in Chemical and Biomolecular Engineering from University of California, Berkeley. Professor Dey’s new office and lab are in the new Bioengineering building along with other CBE and bioengineering related faculty and their respective labs.

RECENT NEWS & UPCOMING EVENTS

• Aimal Khankel, BMSE grad student, wins prestigious NSF Graduate Research Fellowship
• Prof. Siddharth Dey and Prof. Michelle O’Malley labs awarded CNSI Challenge Grant
• Prof. Michelle O’Malley receives the 2017 Camille Dreyfus Teacher Scholar Award
• Prof. Sumita Pennathur receives $1.6 Million ‘Visionary Award’ for diabetes research
• The following UCSB graduate students and post-doc presented at the 19th Annual 2018 UC System-wide Bioengineering Symposium held on June 21-23, 2018 at the Riverside Convention Center:
  o Anna A. Kim, Ph.D., presented a poster: Mechanical Signaling in Intestinal Stem Cell Biology of Fruit Flies.
  o Austin S. Abrams presented a poster: Measuring Changes in Nano fluidic Current as a Continuous Multi-Analyte Biosensor Fro Biological Fluids.
  o Alexandra Downs presented an Oral Session entitled, Electrokinetic Sensing of Immunoglobulin G: a Preliminary Study of IgG Conductivity in Physiologically-relevant Buffer.

Fall 2018 Faculty Seminar Series (ENGR 225) & Professional Development Series (ENGR 230)

10/9 Ru Gunawardane, Ph.D., Director, Allen Institute for Cell Science
10/18 Nancy Stagliano Ph.D., CEO, True North Therapeutics
10/23 Kevin Cash, Ph.D., Chemical & Biochemical Eng., CO School of Mines
11/6 Enoch Yeung, Ph.D., Mechanical Engineering, UCSB
11/13 Ellen M. Sletten, Ph.D., Chemistry & Biochemistry, UCLA
11/20 Brenton D. Hoffman, Ph.D., Biomedical Engineering, Duke
12/4 Angela Pitenis, Ph.D., Materials, UCSB

Congratulations to the CBE/BGE Travel Award winners: Anna Kim, post-doc, Pruitt Group and Alexandra Downs, grad student, Pennathur group.

Congratulations to the Mellichamp Travel Award winners: Austin Abrams, grad student, Pennathur group; Sean Mackenzie, grad student, Pennathur group; Sarah Grundeen, grad student, Theogarajan group; and Jeff Hall, grad student, Jaeger/Chen groups.

To subscribe to the seminar announcements email list, sign up via the CBE website link under ‘Events’ or go directly to https://lists.engr.ucsb.edu/mailman/listinfo/bioengineering-seminars