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## BCME @ SJSU Newsletter: Fall 2017



(LR) Dr. Ram, Dr. Keleş, Dr. Nix (Plenary speaker), Dr. Dattwani (Plenary speaker), Dr. McNeil, Dr. Rosenfeld, Dr. Selvaduray.

### SENIOR PROJECTS AND ALUMNI DAY 2017

The Biomedical, Chemical and Materials Engineering (BCME) Department organized the Senior Projects and Alumni Day 2017 in May to showcase BCME senior projects to local industry and reconnect with the alumni. The event began with two plenary speakers, Dr. William Nix from Stanford University, and Dr. Sammy Datwani from Labcyte. Dr. Nix, an elected member in all three national academies, is arguably our most distinguished alumni from the class of '57. The students presented their projects to experts from industry and academia, and it was a productive and enjoyable meeting for all 200+ attendees.

### FACULTY IN FOCUS: ÖZGÜR KELEŞ

Assistant materials engineering professor Özgür Keleş has been advising senior Ian Hunter's Science Lab VR project. This project is derived from a chemistry lab VR app

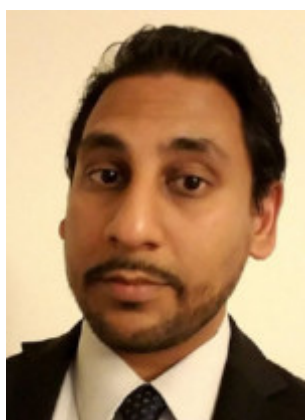
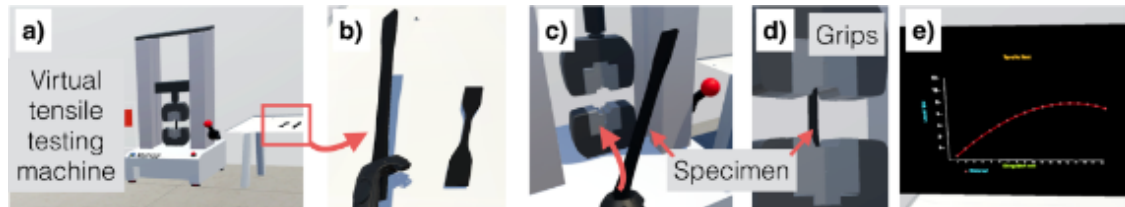
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kind of classroom. Keleş tells us the idea is to get students to learn without being bored or distracted, because it's hands-on learning, without having to purchase expensive equipment that is typically required for hands-on learning.

Students can walk up to a periodic table, grab molecules and slam them together to create polymers and, eventually, see the reactions when molecules interact. A second periodic table allows for more advanced simulations. "Ideally you could go to the periodic table and choose the element you want to test, like steel, either in a rod or a flat sheet, then go to the tensile section and test it there to see the properties of the material," Hunter says.

In the future Keleş wants to add 3D printing into Science Lab VR, "so you can 3D print in virtual reality and then test the material properties of those things," he says. "And if it works, you can then 3D print [the same object] in real life." The idea is to cut down on unnecessary printing and testing, to free up more resources and make it far more efficient to build things.

*Figure: VR environment showing a) tensile testing machine, b) ASTM D638 Type I and IV tensile specimens, c-d) students can hold and put the specimen to the tensile grips, and e) stress-strain diagram generated during the virtual tensile test.*



#### **FACULTY IN FOCUS: XHAVIN SINHA**

Professor Xhavin Sinha has more than 17 years of engineering experience covering a wide range of areas including mining, environmental, pharmaceuticals, and high-tech. He completed his undergraduate degree in Chemical Engineering at the University of British Columbia in Vancouver. He completed his Masters in Chemical Engineering at San José State University in 2005. Professor Sinha has also completed his Juris Doctorate at Santa Clara University and is a practicing attorney specializing in environmental, intellectual property, and business law. His interests include writing, electrochemistry, bioprocess engineering, and control systems. Now in

## SELECTED PUBLICATIONS

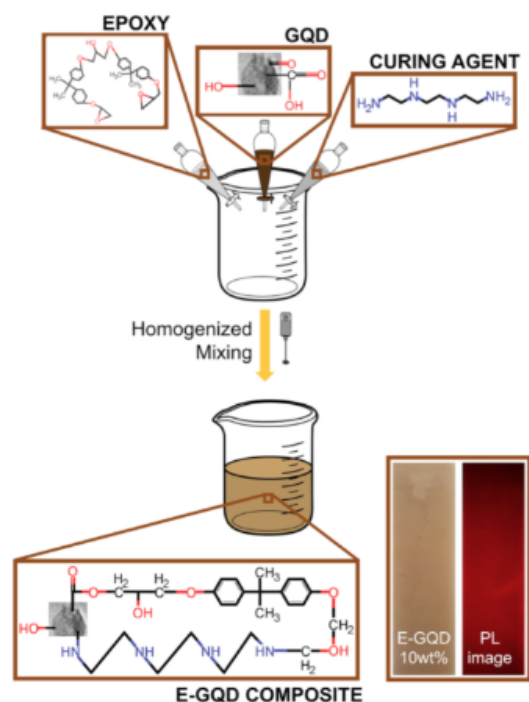
**Bellofiore, A.**, R.R. Vanderpool, M.J. Brewis, A.J. Peacock, N.C. Chesler (2017), "A novel single-beat approach to assess right ventricular systolic function," *J. Appl. Physiol.*, In press.

Gobia, N., D. Vijayakumar, **O. Keles**, **F. Ergobogbo** (2017), "Graphene quantum dots infusion to create stronger, tougher, and brighter polymer composites," *ACS Omega*, 2(8): 4356-4362.

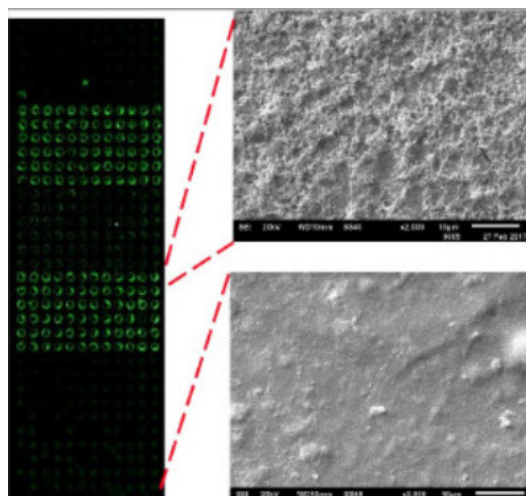
**Komives CF**, Sanchez EE, Rathore AS, White B, Balderrama M, Suntravat M, Cifelli A, Joshi V. (2017), "Opossum peptide that can neutralize rattlesnake venom is expressed in *Escherichia coli*," *Biotech. Progress*, 33:81-86.

Srinivasan, A., G.C. Lee, N.S. Torres, K. Hernandez, S. Dallas, J.L. Lopez-Ribot, C. Frei, **A.K. Ramasubramanian** (2017), "High-throughput microarray for antimicrobial susceptibility testing," *Biotech. Reports*, In press.

**Boylan-Ashraf, P.**, **O. Keles**, S. Freeman, M. Shelley, R. Calfee, (2017) "Can Students Flourish in Engineering Classrooms?," *Journal of STEM Education: Innovations and Research*, 18: 16-24.



*Polymer composites infused with Graphene Quantum dots create materials with interesting properties (see Gobia et al.)*



*A high-throughput microarray promises rapid, cost-effective screening of antibiotic susceptibility of methicillin-resistant *S. aureus* biofilms (Top: without drug; bottom: with drug. Cells were stained for viability) (See Srinivasan et al.)*

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## RESEARCH GRANTS

**A. Bellofiore, A.K. Ramasubramanian** and **L. Rosenfeld** from BCME, along with **K. Gosselin** and **S.J. Lee** of ME were awarded a \$456,000 NSF-MRI grant to procure a Particle Image Velocimetry instrument for their work on the fluid mechanics of circulation in the body, wind tunnels and electronic equipment.

**C.F. Komives** received an award for \$103,000 from the NIH to develop a potential therapy that can be produced in bacteria to counter the cytotoxic effects of snakebite, which is a major reason for mortality and morbidity in Asian countries. She will be collaborating with **A. Rathore** from the Indian Institute of Technology Delhi to develop a new antivenom.

**A.K. Ramasubramanian** received a subcontract for \$240,000 from the Department of Defense through CFDR Inc., to develop better storage methodologies for platelets for transfusion. Platelets are often needed to save lives following trauma or during major surgery, and this research will help improve the product quality and shelf life.

**C.F. Komives, M. McNeil** and **A.K. Ramasubramanian** received Kordestani Research Professor awards from the College of Engineering for \$40,000 each to support their respective research on antivenom development, novel membranes for efficient separations, and portable diagnostic devices.

**M. Simon** received a subcontract of \$60,000 from Lawrence Livermore National Lab for her work on droplet microfluidics and regenerative medicine.

**G. Selvaduray** received an award from The California Seismic Safety Commission to evaluate the post-earthquake economic development incentives that the Japanese national and local governments enacted after the March 2011 Great Tohoku Earthquake Disaster. The lessons learned from this study will be used to propose appropriate post-disaster economic incentives for implementation in California.

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## SPRING 2018 EVENTS

**BCME Seminar Series** was off to a great start in fall 2017. In spring 2018, the graduate seminars will be held 3:15-4:15 pm in E333 on February 16th, March 2nd, and April 6th. Please check the Upcoming Events link on the [BCME website](#) in February 2018.

The **9th Bay Area Biomedical Device Conference**, organized by the SJSU Biomedical Engineering Society, will be held on March 28th, 2018 in the Student Union Ballroom. Learn more: [www.biomedconference.org](http://www.biomedconference.org)

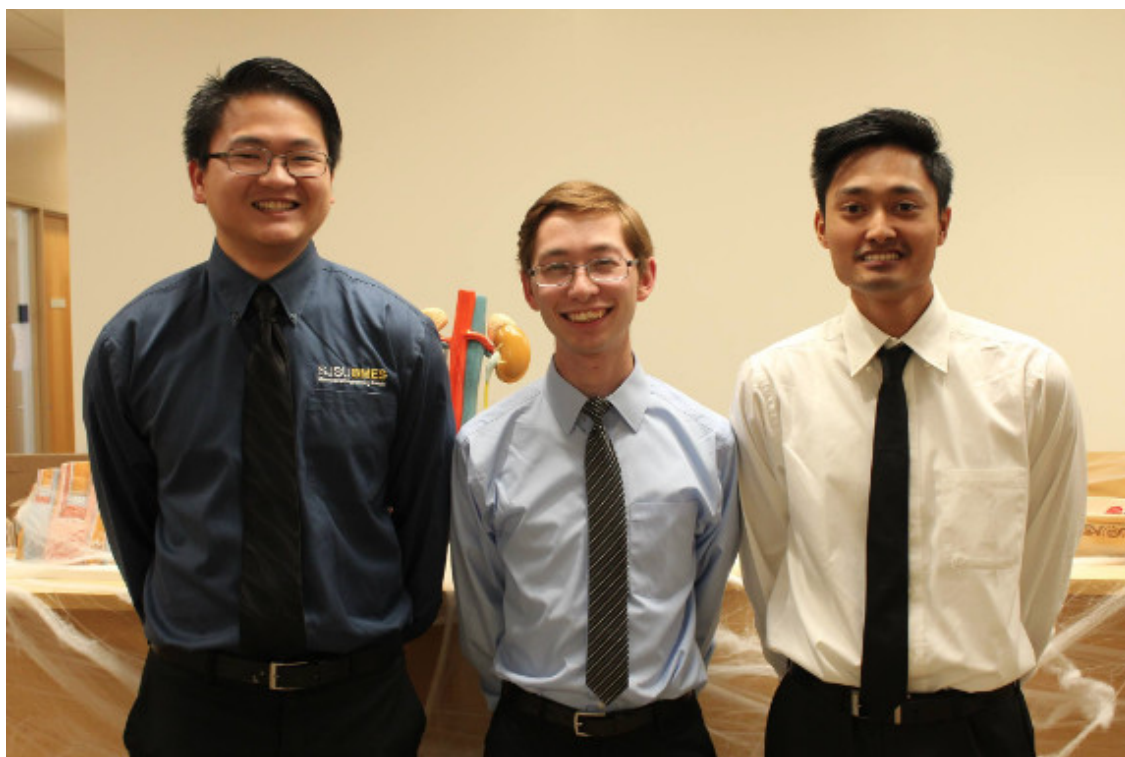
The **2018 Student Conference Day** will be held on May 12th in the Student Union Ballroom featuring presentations by undergraduate and graduate students, talks by leaders from academia and industry, distinguished student and alumni awards, and

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**LAB RENOVATION:** Various BCME teaching and research labs will be renovated in 2018 to accommodate our growing student population (quadrupled in five years!), and the emerging areas of faculty research focus. If you are interested in knowing more, please contact [anand.ramasubramanian@sjsu.edu](mailto:anand.ramasubramanian@sjsu.edu).

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### OUR ACTIVE STUDENT CHAPTERS

L to R: President of the Biomedical Engineering Society (BMES): Hoang Nguyen; President of the American Institute of Chemical Engineers (AIChE): Stephen Schobey; President of Material Advantage (MA): Justin Chua.

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