Department of Engineering Science
Announces 5th lecture of the Engineering Science Lecture Series
Academic Year 2017-2018

This is a series designed to benefit the Sonoma State students and faculty in the School of Science and Technology, high tech and biotech industries and related businesses and community in the North Bay Region.

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The Lecture Series covers a broad range of topics with focus on recent developments and trends and provides a platform for the exchange of ideas among the audience.

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Attendance is open to the students, faculty and staff of SSU and other academic institutions, engineers and scientists from industries, members of the business community and members of the community, in general. A parking permit is required to park on campus, and is available for $5.00 at machines in the parking lots. Talks are otherwise free.

### Days & Dates: 1st & 3rd Thursday of every month

**Venue:** Cerent Engineering Science Complex, Salazar Hall Room #2009A

**Reception:** 4:00 to 4:30 p.m.

**Lecture:** 4:30 to 5:15 p.m.

**Q&A:** 5:15 to 5:30 p.m.

**Acknowledgement**

The ES Lecture Series is supported by the local industry including Keysight Technologies.

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"Gold Foams as Advanced Biomedical Device Coatings"

by

Dr. Erkin Seker, Electrical & Computer Engineering, UC Davis, Davis, CA

Thursday, November 2, 2017

**Abstract** - Nanostructured materials offer tremendous opportunities for engineering advanced device components for diagnostic and therapeutic applications. Nanoporous gold (np-Au), produced by a nano-scale self-assembly process, is a relatively new material and has mostly attracted attention for catalyst applications due to its high effective surface area, electrical conductivity, and ease of surface functionalization. Surprisingly, the biomedical potential of this material has remained largely untapped. I will first discuss our research efforts to control nano-/micro-scale properties of np-Au and the application of micropatterning techniques for fabricating high-sensitivity multiple electrode arrays for neural electrophysiology studies. In the context of biocompatibility of such devices, I will illustrate how tunable properties of np-Au may be utilized to alleviate adverse biological response to device coatings. To that end, I will specifically focus on np-Au’s drug delivery performance and its interaction with neural tissue as a function of its geometric features and surface chemistry. In another example, I will illustrate np-Au’s diagnostic potential in detecting and purifying nucleic acid biomarkers in complex biological samples. I will conclude the talk with our ongoing efforts toward constructing high-throughput material screening platforms for identifying optimal material properties for emerging applications of np-Au.

Dr. Erkin Seker received his PhD degree in Electrical Engineering from the University of Virginia (UVA) in 2007. Following postdoctoral positions in Chemistry at UVA and Bioengineering at Center for Engineering in Medicine at Harvard Medical School, he joined the Department of Electrical and Computer Engineering at UC Davis in 2011. As an Associate Professor, he is leading the interdisciplinary Multifunctional Nanoporous Metals research group with the overarching goal of understanding and controlling nanostructured material properties and their interaction with biological systems to develop novel biomedical tools. He is the recipient of Fund for Medical Discovery Award from Massachusetts General Hospital, a University of California Lab Fees Research Grant, and a NSF CAREER Award. He served as an Associate Scientific Advisor for Science Translational Medicine journal, was invited to participate in National Academy of Engineering’s Annual Frontiers of Engineering Education Symposium, and was selected as a BMES Cellular and Molecular Bioengineering Young Innovator of 2016.

### Upcoming Lectures

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<td>Building a Software Defined Radio Application in 7 min</td>
<td>Mr. Mohammad Salah, R&amp;D Engineer, National Instruments</td>
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