

**DEPARTMENT OF CHEMISTRY AND
ENVIRONMENTAL SCIENCE**

SPRING 2017 SEMINAR SERIES

**Sponsored by: Purdue Pharma L.P.
Bristol-Myers Squibb Company**

**TUESDAY, FEBRUARY 14, 2017
10:00 AM**

**ECE Conference
ROOM 202**

GUEST SPEAKER

**Adam Wanekaya,
Associate Professor
Chemistry Department
Missouri State University
Springfield, MO**

TOPIC

**Fabrication and Modification of Nanoscale Materials for Analytical, Environmental and
Biological Applications**

ABSTRACT

This presentation will focus on current and recent research group which includes the fabrication, modification and applications of nanoscale materials from carbon, metals, metal oxides and polymers. Nanoscale materials have unique and tunable properties enabling applications in various fields spanning from health, electronics, energy and environmental sectors. Specifically, we highlight the properties of these materials that enable their applications in detection, therapeutics and remediation of environmental pollutants. We will demonstrate the real-time electrochemical sensing of proteins down to nanomolar levels using modified conducting polymer nanowires. We will also demonstrate the sorption, preconcentration and electrochemical detection of heavy metals ions in aqueous solutions down to parts per billion levels using modified carbon-based nanomaterials. Additionally, fast and efficient removal of these heavy metals from aqueous solutions in a matter of minutes to levels that are much below the Environmental Protection Agency's guidelines for drinking water will also be demonstrated. Finally, we will demonstrate how nanomaterials stabilize and enhance the activity of biological

molecules such as enzymes and nucleic acids and how these nanoconjugates have been used for biosensing and nucleic acid delivery purposes.

BIOGRAPHY

Adam K. Wanekaya is an Associate Professor of Chemistry at Missouri State University in Springfield, Missouri. He received his Bachelors and Masters Degrees from the University of Nairobi in Nairobi, Kenya in 1990 and 1994 respectively. He worked in the private sector for five years before coming to the United States in 1999 when he joined the Ph. D. in Chemistry at the State University of New York in Binghamton, NY. He graduated with a Ph.D. Degree in Chemistry in 2004. He proceeded to perform Postdoctoral Research at the University of California's Department of Chemical and Environmental Engineering in Riverside, California from 2004 to 2006. In 2006, he accepted an offer to join Missouri State University as an Assistant Professor. He was promoted to Associate Professor in 2011. Current research in his laboratory focuses on the design and development of protocols/materials/devices with potential applications in chemical sensing, biosensing, environmental remediation and therapeutics.

Committee Members: Edgardo Farinas, Yong-Ick Kim, Mengyan Li,
Som Mitra, Zeyuan Qiu