DEPARTMENT OF CHEMICAL & ENVIRONMENTAL ENGINEERING

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DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Investigation And Modification Of Bio/Abiotic Interfaces For Energy Recovery, Water And Wastewater Treatment, And Public Health Protection

Biological processes play important roles in environmental treatment, bioenergy production, and disease control. However, rate-limiting microbial reactions often occur at the bio/abiotic interfaces in those systems, such as biofilm attachment, extracellular electron transfer, and cross-membrane substrate transport. In this talk, I will present three brief demonstrations of modifying biofilms on electrode surface in microbial electrochemical systems for energy production, wastewater treatment, and biofuels synthesis. Further mechanistic investigation on extracellular electron transfer in a model conductive biofilm will be discussed in a theoretical method set. Finally, I will give an outlook on my recent efforts in designing membrane-intercalating materials for antimicrobial purposes and potential biofilm modification in wastewater consortia.

Biosketch: Dr. Hengjing Yan received her B.S. (2008) degree in Environmental Engineering with an Outstanding Thesis Award from Tsinghua University for microbial community analysis in municipal wastewater treatment plants. She obtained her M.S. (2010) and Ph.D. (2013) degrees from Civil and Environmental Engineering with Professor John M. Regan at Pennsylvania State University, where she investigated system design and microbial functions in microbial electrochemical systems for energy recovery, nutrient removal, and biofuels production. She became a postdoctoral researcher (2013) and then assistant project scientist (2015) in the Department of Chemistry and Biochemistry at University of California, Santa Barbara, with Professor Guillermo C. Bazan and Professor Frederick W. Dahlquist. During her postdoctoral research, she established a systematic method to analyze electron transport properties of conductive biofilms, by combining protein modeling and quantum mechanic calculations. She is currently developing a new category of membrane-intercalating materials for antimicrobial functions and microbial community modification on conductive wastewater biofilm.

Wednesday, **March 16, 2016**

9:00—10:00 AM

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