UNIVERSITY of HOUSTON

CULLEN COLLEGE of ENGINEERING

Department of Civil & Environmental Engineering

CIVE 6111 Graduate Seminar

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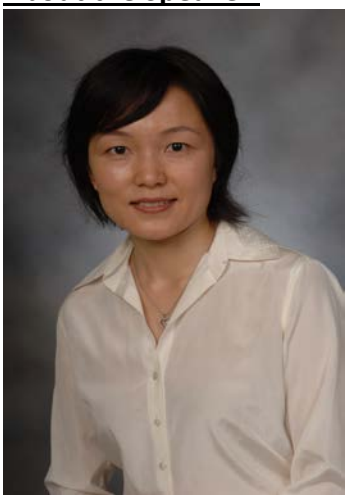
Nanotechnology Based Strategies for Controlling Membrane Biofouling

Friday, October 13, 2017
2:45PM-3:45PM
Classroom Business Building (CBB) Room 122

Abstract

Biofouling is a particularly difficult problem among the various operational challenges in application of membrane systems for water and wastewater treatment. Control measures can be developed to interfere with the different stages of the biofouling process. Common strategies include membrane surface modification to reduce bacterial and biopolymer adhesion, pretreatment to remove biopolymers, disinfection to control microbial growth, and chemical cleaning to remove fouling materials. Compared to conventional approaches, nanotechnology offers several advantages including targeted treatment, simple implementation and low operation and maintenance cost. In addition, biological control of membrane biofouling, e.g., utilizing biochemical signal compounds to interfere with biofilm formation, is highly desirable, yet its implementation in engineered treatment systems is challenging due to the current high cost and the limited activity of biomolecules. The use of nanotechnology to deliver biochemical signal compounds has the potential to achieve environmentally friendly and sustainable control of membrane biofouling. The presentation will discuss novel nanotechnology based methods for membrane biofouling control, their potential and current limitations.

About the Speaker:



Dr. Qilin Li is a Professor of Civil and Environmental Engineering, Chemical and Biomolecular Engineering, and Materials Science and Nanoengineering at Rice University. Dr. Li received her B.E. degree in Environmental Engineering from Tsinghua University in Beijing, China, her M.S. and Ph.D. degrees in Environmental Engineering from University of Illinois at Urbana-Champaign, and her post-doctoral training at Yale University. Dr. Li's research focuses on advanced technologies for water and wastewater treatment and reuse including adsorption, membrane separation, advanced oxidation and environmental nanotechnology, novel desalination methods, environmental fate and transport of contaminants, and environmental impact of nanotechnology. She has led many research projects funded by National Science Foundation, US Environmental Protection Agency, WateReuse Foundation, United Nation, and industry. Dr. Li currently serves as the chair for the IWA Nano&Water Specialist Group Managing Committee, the Associate Director for Research for the NSF Nanosystems Engineering Research Center for Nanotechnology Enabled Water Treatment (NEWT), and a member of the US EPA Science Advisory Board's Environmental Engineering Committee. She was the recipient of the Shenzhen Pengcheng Distinguished Scholarship, NRC Summer Faculty Fellowship, Roy E. Campbell Faculty Development Award, ES&T Super Reviewer and Excellence in Review awards, American Water Works Association (AWWA) Water Quality and Technology Conference Best Paper Award, Parsons Engineering Science/AEESP Best Doctoral Thesis Award, and AWWA Larson Aquatic Research Award.