THE UNIVERSITY OF TEXAS AT EL PASO
COLLEGE OF ENGINEERING

DISTINGUISHED SPEAKER SEMINAR SERIES

THURSDAY, FEBRUARY 18, 2016 | 2:30 pm – 3:30 pm | CCSB G.0208

Refreshments will be served

THE NEXT GENERATION OF DRINKING WATER DISINFECTION By-Products: Occurrence, Formation, Toxicity, and New Links with Human Epidemiology

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Susan D. Richardson is the Arthur Sease Williams Professor of Chemistry in the Department of Chemistry and Biochemistry at the University of South Carolina. Prior to coming to USC in 2014, she was a research chemist for several years at the U.S. EPA's National Exposure Research Laboratory. Susan is the recipient of the 2008 American Chemical Society Award for Creative Advancements in Environmental Science & Technology, has received an honorary doctorate from Cape Breton University in Canada (2006), and serves as an Associate Editor of Water Research and on the Editorial Advisory Board of Environmental Science & Technology, Rapid Communications in Mass Spectrometry, Environmental Science and Pollution Research, Journal of Hazardous Materials, and Journal of Environmental Sciences. Susan has published more than 120 journal articles and book chapters. She has a Ph.D. in Chemistry from Emory University and a B.S. in Chemistry & Mathematics from Georgia College & State University.

ABSTRACT

Drinking water disinfection by-products (DBPs) are an unintended consequence of using chemical disinfectants to kill harmful pathogens in water. DBPs are formed by the reaction of disinfectants with naturally occurring organic matter, bromide, and iodide, as well as from anthropogenic pollutants, such as pharmaceuticals and pesticides. Potential health risks of DBPs from drinking water include bladder cancer, early-term miscarriage, and birth defects. Risks from swimming pool DBP exposures include asthma and other respiratory effects. Several DBPs, such as trihalomethanes (THMs), haloacetic acids (HAAs), bromide, and chlorite, are regulated in the U.S. and in other countries, but other "emerging" DBPs, such as iodo-acids, halobenzoquinones, halonitromethanes, haloamides, halofuranones, and nitrosamines are not widely regulated. DBPs have been reported for the four major disinfectants: chlorine, chloramines, ozone, and chlorine dioxide (and their combinations), as well as for newer disinfectants, such as UV treatment with post-chlorination. Each disinfectant can produce its own suite of by-products. Several classes of emerging DBPs are increased in formation with the use of alternative disinfectants (e.g., chloramines), including nitrogen-containing DBPs ("N-DBPs"), which are generally more genotoxic and cytotoxic than those without nitrogen. Analytical methods continue to be developed to measure target DBPs, and research continues to uncover new DBPs that are part of the missing fraction of DBPs not yet accounted for. This presentation will provide a state-of-the-science overview of the formation of DBPs from different disinfectants, along with mechanisms of formation when known, as well as new links to human epidemiology resulting from the new HiWATE Study conducted in Europe.

THE DISTINGUISHED SEMINAR SERIES

Established by the Dean's Office in the College of Engineering (CoE) in the spring of 2015, the CoE Distinguished Speaker Seminar Series brings internationally renowned experts, leaders and policy makers to help facilitate information exchange in order to promote research activity in the College, and enhance collaborative opportunities. The Seminar Series is funded through the research budget for the College in the Dean's Office.

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