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MSEC SEMINAR AND COMMERCIALIZATION FORUM



INVITED SPEAKER:

KEISUKE IKEHATA

“Development of a New Photobiological
Treatment Process for Desalination and
Water Reuse: NSF SBIR Phase I Project”



October 4th, 2019

1:30 – 3:00 PM

RFM 3224

Biography:

Dr. Ikehata is an Assistant Professor of Civil Engineering in the Ingram School of Engineering, Texas State University, San Marcos, Texas. Dr. Ikehata received his B.Eng. in Applied Chemistry, M.Eng. in Civil Engineering, and Ph.D. in Civil and Environmental Engineering from Doshisha University, Kyoto, Japan, McGill University, Montreal, Quebec, Canada and University of Alberta, Edmonton, Alberta, Canada, respectively. Prior to coming to Texas, Dr. Ikehata taught in the Department of Chemical and Environmental Engineering at the University of California, Riverside and the Department of Chemistry and Biochemistry at California State University, Fullerton in 2018-2019. From 2009 to 2018, he was an R&D Manager at a water resources engineering firm Pacific Advanced Civil Engineering, Inc. in Fountain Valley, California. Dr. Ikehata also performed his postdoctoral research in the Department of Medicinal Chemistry at the University of Kansas, Lawrence, Kansas (2004-2005) and in the Department of Civil & Environmental Engineering at the University of Alberta (2005-2009).

FOR MORE INFORMATION OR IF YOU WOULD LIKE TO HAVE LUNCH WITH THE SPEAKER,
PLEASE CONTACT DR. SHANNON WEIGUM AT SWEIGUM@TXSTATE.EDU

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Dr. Ikehata's research interests and areas of expertise include water and wastewater treatment technologies, water reuse, desalination, stormwater management, environmental microbiology and biotechnology, aquatic chemistry and biology, and xenobiotics toxicology and risk assessment. Dr. Ikehata has published more than 140 technical publications, including original research articles, review papers, invited book chapters, edited conference proceedings, conference papers, and professional magazine articles. He also has one US patent on a water treatment technology. Dr. Ikehata has been an active member of many organizations such as the American Water Works Association (AWWA), American Chemical Society (ACS), International Ozone Association (IOA), and Water Environment Federation (WEF). Dr. Ikehata is a registered professional environmental engineer in Alberta and Arizona.

Abstract:

Concentrate management is one of the major challenges of water utilities and other industries operating reverse osmosis (RO)-based desalination and advanced water purification facilities (AWPFs) due to many regulatory, economic and environmental constraints against the disposal of concentrate. Many of the existing potable reuse projects started seeking for opportunities to reduce the volume of their concentrate streams by increasing the permeate recovery. However, frequent cleaning of RO elements and/or the use of more chemicals such as threshold inhibitors are often required to prevent scaling by silica and calcium carbonate/sulfate. To overcome this problem, a new technology to treat the concentrate to recover more water has been developed using selectively cultured brackish water diatoms and natural sunlight. This R&D project was partially funded by the National Science Foundation Small Business Innovation Research (NSF SBIR) program and the U.S. Bureau of Reclamation (USBR) Pitch to Pilot program. The study showed that many of the AWPFs and brackish groundwater desalters would be able to recover more than 95% of potable water while reducing the volume of concentrate by more than 50% from the current operations.

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In this seminar, the journey from a serendipitous discovery of the new water treatment technology idea to a federally funded R&D project will be presented. The research evolved from a do-it-yourself experiment in a cubicle of the inventor in 2012 and on-and-off preliminary experiments over many weekends and evenings for four years to a full-blown R&D effort with a group of six full-time research engineers and scientists, including three PhDs, with a budget of \$325,000, including a five-month field demonstration pilot project in New Mexico funded by USBR. In addition, the entrepreneurial training through the NSF “Beat-the-Odds Boot Camp” program and the effort towards commercialization in Phase II SBIR (not pursued) will be discussed.

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