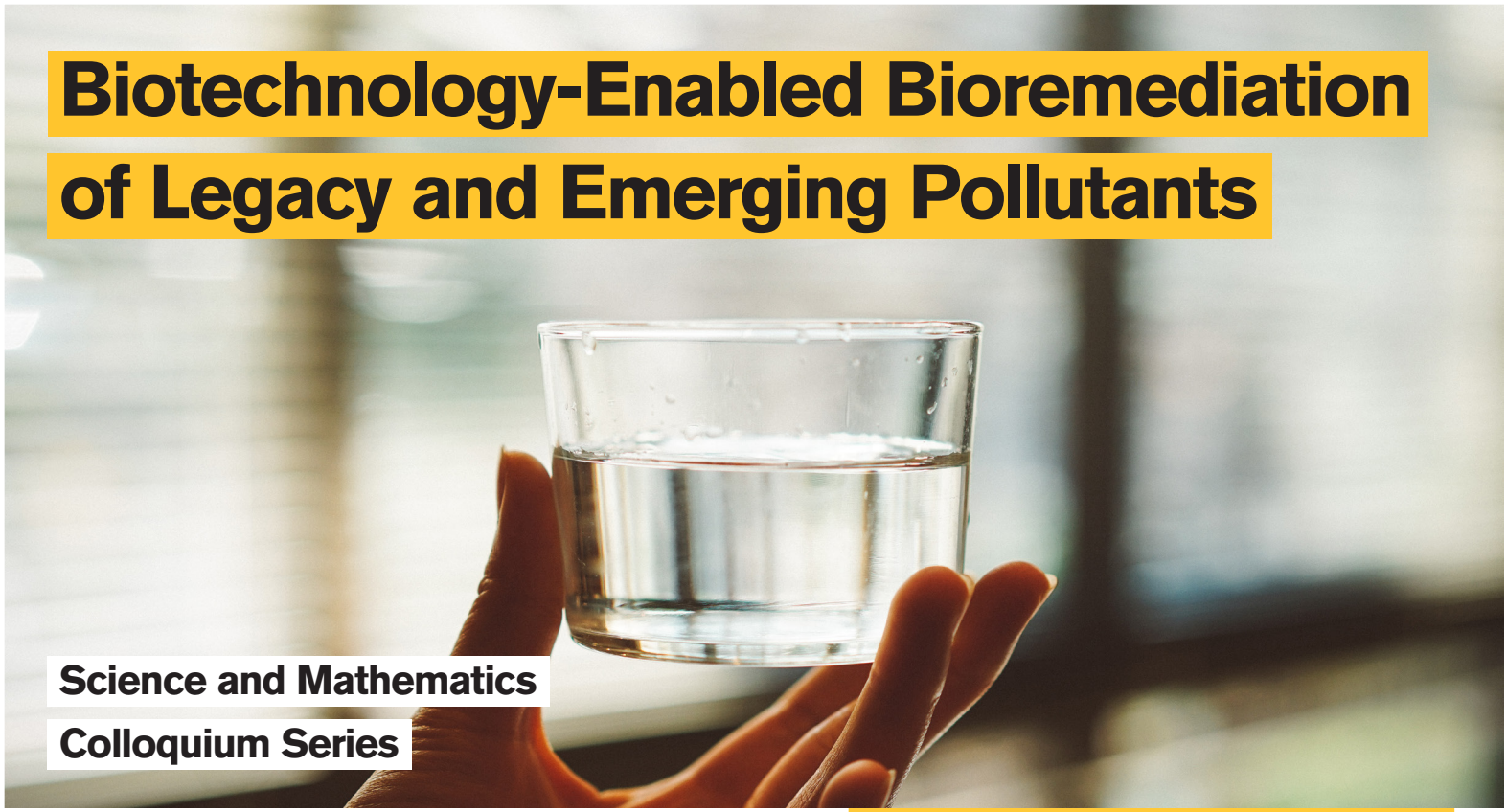
Biotechnology-Enabled Bioremediation of Legacy and Emerging Pollutants



Science and Mathematics Colloquium Series

Wed., Sept. 23, 3 p.m.

Zoom link: https://asu.zoom.us/j/99112840824

1,4-Dioxane (dioxane) contamination has emerged as a compelling global water issue considering its carcinogenic potential and prevalent occurrence in aquatic environments, posing imminent risks to human health and natural biota. Bioremediation, primarily relying on microbial degradation, is reputable as a green and economical alternative to mitigate and dilute the large plumes formed by dioxane.

In this presentation, Dr. Li will introduce recent research findings that uncover the molecular foundations (e.g., genes, enzymes, and pathways) of dioxane biodegradation with the assistance of state-of-the-art biotechnologies. Using heterologous expression systems, catalytic functions and kinetics of key dioxane-degrading enzymes were characterized and compared. Notably, some of these novel enzymes demonstrated superior capabilities of oxidizing chlorinated aliphatic hydrocarbons (e.g., TCE, 1,1-DCE, and VC) that frequently co-exist with dioxane at impacted sites. These discoveries enable the development of site-specific bioremediation strategies optimized for the cleanup of commingled pollution of dioxane and chlorinated solvents.

Questions? Contact Steven.Saul@asu.edu

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Specializing in environmental microbiology and biotechnology, Dr. Li's research focuses on untangling novel microbial processes that decompose and transform emerging contaminants and developing effective treatment technologies suitable for municipal, industrial, and agricultural settings. His research group tackles frontier challenges in the water-energy-food nexus, combining modern biotechnological tools with high-resolution mass spectrometry. Their work has been featured on the cover of Environmental Science and Technology Letters and reported in other public media. Li earned MS and PhD degrees in environmental engineering at Rice University. He has received the NSF CAREER Award, ISPTS Young Scientist Award, and NJIT CSLA Research Rising Star Award.

Faculty and practitioners discuss their current research and field projects in the Science and Mathematics Colloquium Series, held throughout the academic year at ASU's Polytechnic campus. All seminars are free and open to the public.

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