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Keynote Speaker

Dr. Jianzhong He

A Journey to Discover Microorganisms that Respire Persistent Organic Pollutants

Siyan Zhao, Guofang Xu, and Jianzhong He

Department of Civil and Environmental Engineering
National University of Singapore
(email: ceehj@nus.edu.sg)

Urban watersheds, soil, and groundwater are important environments serving as sources of drinking water, often creating a great potential for migration of any aquatic contamination and resulting in wide distribution of contaminants such as persistent organic pollutants. Anaerobic bacteria play critical roles in environmental bioremediation of persistent halogenated compounds such as polybrominated diphenyl ethers (PBDEs) and polychlorinated biphenyls (PCBs). However, limited information is available on microbes which can tackle this group of persistent organics. Here we discuss a specialized microbial genus - *Dehalococcoides mccartyi* strains which can respire both chlorinated and brominated persistent organic pollutants in the environment. Especially we found that the functional reductive dehalogenase genes are not necessary substrate specific, indicating that one *Dehalococcoides mccartyi* strain could possibly respires an array of halogenated compounds via engaging one functional reductase genes. We also analyzed pangenomic information of available *Dehalococcoides* species and inferred the evolution of this special group of microorganisms. Thus this group of specialized microbes has the potential to remediate multiple halogenated compound contaminated sites via bioaugmentation strategy.

Biography

Dr. Jianzhong He is an Associate Professor in the Department of Civil and Environmental Engineering at the National University of Singapore. She received her Ph.D. degree at the Georgia Institute of Technology in 2003 from Professor Frank Löffler's lab. Prior to that, she obtained her M.S. and B.S. degrees from Tsinghua University and Harbin Institute of Technology in 1998 and 1995, respectively. She was a postdoctoral researcher in Professor Lisa Alvarez-Cohen's lab at the University of California Berkeley for two years before joining the National University of Singapore as an assistant professor in 2005. Dr. He's research focuses on discovering novel microorganisms to transform and detoxify environmental contaminants, enhancing biodegradation by optimizing the growth of functional microbes, biomass to bioenergy/biochemicals, nutrients removal from wastewater, and applying nucleic acid-based approach in laboratory cultures and *in situ*. During her tenure at NUS, Dr. He has generated more than 80 peer-reviewed publications while securing significant amount of external funding from diverse funding agencies (>17million in the past 10 years). So far, her publications have been cited for more than 5000 times (Google Scholar) and an H-Index of 31. She holds several patents and collaborates widely with industrial, governmental and scientific partners. She is also the editorial board member of the *Journal of Scientific Reports, the ISME Journal, Applied and Environmental Microbiology, and Associate Editor of the Frontiers in Microbiology*.