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Keynote Speaker

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Corrinoid Metabolism and Utilization in Organohalide-Respiring Bacteria

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Organohalide-respiring bacteria (OHRB) depend on corrinoids to utilize organohalogens for energy conservation. Physiological tests combined with genome analysis demonstrated that while metabolically versatile OHRB (e.g., *Sulfurospirillum*, *Desulfitobacterium*) generally are capable of *de novo* corrinoid biosynthesis, the majority of obligate OHRB (e.g., *Dehalococcoides mccartyi*, *Dehalogenimonas* spp., *Dehalobacter restrictus*) are corrinoid auxotrophs that strictly depend on external corrinoid supply. In recent years, novel cobamides (i.e., complete form of corrinoids) have been identified in several tetrachloroethene-dechlorinating *Sulfurospirillum* spp. and *Desulfitobacterium* spp., indicating that OHRB harbor a largely unexplored corrinoid biosynthetic capacity. Further, a number of studies have revealed that the naturally occurring cobamides are not functionally equivalent and taxonomically diverse OHRB exhibit distinct cobamide preferences. These findings emphasize a previously overlooked ecology between corrinoid prototrophs and corrinoid auxotrophs, with implications for the targeted manipulation of microbiome function, spanning applications from human health to environmental biotechnology, including enhanced anaerobic bioremediation at sites impacted by chlorinated contaminants.

Biography

Dr. Yan obtained the BS and MS degrees from Nanjing University (Nanjing, Jiangsu, China) and the Ph.D. degree from the Louisiana State University (Baton Rouge, LA, USA). He continued his research in the field of organohalide respiration as a postdoctoral researcher at the Georgia Institute of Technology (Atlanta, GA, USA) and the University of Tennessee (Knoxville, TN, USA). Dr. Yan worked as a research assistant professor in the Department of Microbiology at the University of Tennessee before started his tenure as a professor in the Institute of Applied Ecology at the Chinese Academy of Sciences. The research activities at Yan's lab focus on explore the fundamentals of relevant microbial processes (i.e. organohalide respiration, cobamide biosynthesis) involved in the biodegradation and biotransformation of hazardous contaminants. Yan's lab combine cultivation, molecular, biochemical and meta-omics approaches to advance understanding of essential metabolic pathways and the microbial ecology in the contaminated environments.