SPEECH INFORMATION (For Conference Program Book)	
Topic	Microbial Organohalide Detoxification Under Marine-Level Salinity Conditions
Abstract	Organohalide-respiring bacteria (OHRB) are crucial biogeochemical agents that employ reductive dehalogenase enzymes to mediate organohalide respiration. This distinctive metabolic process is fundamental to global halogen cycling and underpins a leading in-situ bioremediation strategy for contaminated soil and aquifer. Specifically, strains of Dehalococcoides mccartyi and, more recently, Dehalogenimonas spp. are biotechnologically central because they can completely detoxify hazardous organohalides, such as trichloroethene, into the non-toxic product ethene. Although effective in terrestrial, freshwater sites, organohalide detoxification remains difficult in environments with high or increasing salinity (e.g., coastal zones, brackish waters, or sites affected by salinization). Although limited evidence suggests that dehalogenation can occur under these conditions, the molecular and physiological mechanisms that enable complete trichloroethene dechlorination under high-salinity stress remain largely unknown. This lack of understanding hinders the development of robust remediation solutions for a growing number of salinized contaminated sites worldwide. This talk will highlight recent advances in elucidating the basis of microbial halotolerance among key OHRB. Integrating genomic, physiological, and ecological data, we demonstrate that specific Dehalococcoides subspecies and Dehalogenimonas strains possess distinct genomic signatures that enable them to sustain complete trichloroethene dechlorination even under marine-level high-salt conditions. These features reveal novel functional specializations that secure the reductive dechlorination pathway in high-saline environments. Decoding these mechanisms provides a critical foundation for engineering robust, low-carbon biotechnologies capable of sustained organic pollutant remediation, offering a viable solution for the cleanup of contaminated sites in an increasingly salinizing world.