

## CONCURRENT SESSION 5 – WASTE MANAGEMENT

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### **Bio-Inspired Engineering for Sustainable Remediation of Hazardous Waste**

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Biological systems have been used for remediating sediments, soil, and water in the past decades. However, there is an immediate need to introduce new remediation technologies to meet the current and future environmental challenges. Recent advances in science and engineering allow the development of new technologies that are more cost-effective, sustainable, and suitable to address the current and future regulatory expectations. Synthetic biology and biomimetic engineering approaches have the potential to revolutionize the remediation industry in a feasible manner. Here, two examples of such engineered systems are presented 1) nano-enhanced dialytic purification systems for selective removal of targeted contaminants from complex mixtures, and 2) an engineered biological system using bacterial communities and a robust hyperaccumulator plant for remediation of highly contaminated sites under extremely harsh environmental conditions. In these efforts, nanoscience, biology, and engineering are all combined into developing new engineering solutions. The objective is to offer the industry in-situ remediation technologies that are cost-effective and self-sustained with the lowest ecological footprint.

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