



The influence of structural and functional microbial ecology on the performance of engineered biological nitrogen removal reactors

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Biological nitrogen removal (BNR) is achieved by the processes of nitrification and denitrification acting in concert. Despite the widespread practical implementation of nitrification and denitrification in wastewater treatment plants, these processes and the engineered bioreactors that foster them are typically described as ‘black’ or ‘grey’ boxes with limited or no acknowledgement of the identity, abundance and activity of the microbial biocatalysts driving these processes.

This presentation is divided into two main parts. In the first, the use of microbial ecology tools in combination with conventional mathematical constructs to describe ammonia and nitrite oxidizing bacterial abundance and biokinetics in partial nitrification reactors is described. In the second, the use of stable isotope probing to unravel the structural and functional aspects of heterotrophic denitrification is presented.

Speaker biography

Dr. Kartik Chandran is Asst. Professor of Environmental Engineering and Director of the Environmental Health Engineering Program at Columbia University. He has a Bachelors in Chemical Engineering from the Indian Institute of Technology, Roorkee and a PhD in Environmental Engineering from the University of Connecticut. The primary research directions of the Kartik Chandran Research Group are in environmental microbiology, molecular biology and biotechnology.