



**INDIAN INSTITUTE OF TECHNOLOGY DELHI  
DEPARTMENT OF BIOCHEMICAL ENGINEERING &  
BIOTECHNOLOGY**

**2018-19 Seminar Series**

**Wednesday, 28<sup>th</sup> November, 2018**

**Dr. Sunil Mundra**

**Researcher**

**Section for Genetics and Evolutionary Biology  
(EVOGENE), Department of Biosciences,  
University of Oslo, Oslo, Norway**

**Title: Microbial communities in the soil and plant roots: an environmental sequencing approach and pitfalls**

Until last two decades, microbial ecological studies were mostly based on traditional culturing-based methods and later equipped with Sanger's sequencing, still providing only handful of information. In recent years, we are witnessing a fascinating change and increase in the ecological reports, revolutionized by development of Next Generation Sequencing (NGS) technology. These technologies allow us to sequence molecular barcode quickly and cheaply than the traditional methods; provided a new era of "omics" (Metabarcoding, Metagenomics and Metatranscriptomics) technology, and accepted worldwide to solve ecological puzzles. Using NGS tools, our investigation showed that soil and plant roots host diverse microbial assemblages in polar and boreal forest ecosystem, and strongly structured by environmental filtering and niche differentiation from small to global scale. Ongoing unmanaged forest alteration is a big threat to microbial diversity, and when experimentally excluded one microbial partner (invertebrates) from ecosystem loop strongly altered resident communities and wood decomposition rates, suggesting importance of microbial interactions in soil. Further, our NGS- based studies confirmed previous hypothesis of inter-kingdom (bacteria and fungi) antagonism, as reflected in the association of bacterial antibiotic resistance gene (ARGs) with fungal relative abundance. In summary, high-throughput techniques provide a solid support in understanding of the hidden microbial diversity of the world's different ecosystem, being still in an initial exploratory phase compared to macrofaunal (plant and animal) studies.

**All are welcome**

**Seminar will be held in DBEB Seminar room at **Block I, Room 223** at **4 pm****

**For additional information, contact Seminar coordinator Dr. Preeti Srivastava at [preeti@dbeb.iitd.ac.in](mailto:preeti@dbeb.iitd.ac.in) or Dr. D. Sundar at [sundar@dbeb.iitd.ac.in](mailto:sundar@dbeb.iitd.ac.in)**