Bose Colloquium

S. N. Bose National Centre for Basic Sciences

(An Autonomous Research Institute established under DST, GOI)

Title: *Antimicrobial Resistance: Exploring Marine Actinobacteria as Source of Antibiotics and Biofilm Inhibitors*

Abstract: *Antimicrobial resistance (AMR) remains a significant global health concern, exacerbated by the formation of bacterial biofilms. Biofilms, complex communities of bacteria encased within an extracellular matrix, pose challenges to antibiotic treatment efficacy. Biofilm formation progresses through distinct stages, offering targets for intervention to prevent or disrupt biofilms and enhance antimicrobial effectiveness. Biofilms contribute to AMR by impeding antibiotic penetration, reducing bacterial growth, and facilitating horizontal gene transfer. Novel strategies are needed to combat biofilms and address AMR.*

Natural compounds from various sources, including plants, microorganisms, and marine environments, show promise as biofilm inhibitors. Specifically, plant-derived compounds, polymers, enzymes, polysaccharides, and biosurfactants exhibit the potential in disrupting biofilm formation.

Interestingly, Actinobacteria, particularly Streptomyces species, have been a source of most of the antibiotics in the world. They produce bioactive compounds with antimicrobial properties, offering opportunities for developing novel antimicrobial agents targeting biofilms. In this context, marine actinobacteria, are largely unexplored, offer a vast reservoir of potential biofilm inhibitors due to their ability to thrive in extreme environments.

Advancements in genomic and metagenomic technologies enable the exploration of marine actinobacteria, potentially uncovering valuable antimicrobial compounds.

In summary, understanding biofilm formation and developing innovative strategies to target biofilms are essential for addressing AMR. Leveraging natural compounds and exploring microbial sources, especially marine actinobacteria, hold promise for combating biofilm-related infections and mitigating AMR proliferation. The talk will encompass above aspects with current work of our lab in this area.

08th August, 2025

4.00 PM

At Silver Jubilee Hall

YouTube Link

Webinar Link

Short Biography of the Speaker:

Prof. Sunil K. Khare currently holds the position of Director, IISER Kolkata along with Institute Chair Professor of Biochemistry (HAG) at IIT Delhi. He also serves as the Vice Chancellor of the Netaji Subhash Chandra Bose Institute of Higher Learning (NSCBIHL), Andaman & Nicobar Islands. He received his doctoral degree in Biochemistry (1990). He did his Postdoctoral research at the National Food Research Institute, Tsukuba, Japan. Prof. Khare has more than 30 years of teaching and research experience with 230+ research publications (h-index of 54) and five product/ process patents, 25 book chapters and books. He has deposited many microbial strains to MTCC and submitted fifty sequences to the National GenBank. He has guided several master's and PhD students. He has been listed as Top 2% of world scientists working in the area of Biochemistry based on i10 index by the International Ranking Institute, Ad Scientific Index. His noteworthy contributions have been in the area of extremophiles, and enzyme technology for seminal applications in nano, food, and environmental biotechnology. Prof. Khare holds a good reputation in international research community. He has been invited as a visiting Professor to the University of Blaise Pascal, Clermont Ferrand, France (2018 and 2014). He was a Visiting Fellow (DBT) at Northern Regional Research Laboratory, USDA, Peoria IL, USA (2006). Prof. Khare has been honored with several awards and fellowships.Some of his notable awards are IITD Basic Science Research Award 2021, United Nations-Amway Award 1998, and the Malaviya Memorial Faculty Award 2018. He is also an elected fellow of prestigious societies like Royal Society of Chemistry (FRSC); NAAS Fellow, India; IBP fellow, France; UNU-Kirin Fellow, Japan; Fellow of BRSI India; and Fellow of Microbiological Society India. He is currently, the President-Elect of the Association of Microbiologists of India, and the Vice-President of Biotech Research Society of India.

Speaker: Prof Sunil K Khare, Director, IISER - Kolkata