



INDIAN INSTITUTE OF TECHNOLOGY DELHI
HAUZ KHAS, NEW DELHI, 110016

Prof. T. K. Ghose Memorial Award 2023

Department of Biochemical Engineering and Biotechnology
IIT Delhi



Programme

September 06, 2023 (Wednesday)

Venue :Lecture Hall Complex - 121



Time (IST)

- 4:00 PM **Prof. Ritu Kulshreshtha**, Head DBEB
Introduction to the Memorial Award
- 4:10 PM **Prof. Subhash Chand**, (PhD, IIT Delhi, 1978)
Reminiscences about Prof. Ghose
- 4:15 PM **Prof. Anushree Malik**, Introduction to the Awardee
- 4:20 PM **Dr. Saurabh Samuchiwal** - Awardee
Development and on site validation of Sequential
Microbial Based Anaerobic-Aerobic Reactor
Technology (SMAART) for textile effluent treatment
- 4:40 PM Introduction to the speaker
- 4:45 PM **Prof Banwari Lal**, Senior Director, EIBD,
Lecture on Application of Biotechnology Solution in
Oil Industry
- 5:25 PM **Vote of Thanks**
- 5:30 PM **High Tea**

Prof. T.K. Ghose Memorial Award 2023

Prof T.K. Ghose Endowment



Prof. Tarun Kumar Ghose

The initiator of Biotechnology and Biochemical Engineering research in India. Born on Sep 01, 1924, in West Bengal, he got a doctorate in Science from ETH, Switzerland. Held Professorship in Jadavpur University (Kolkata), HBTI Kanpur and IIT Delhi. Worked with many world renowned scientists from US Natick Lab to France, Switzerland, Australia, Russia, Japan, Brazil, Germany, Poland, Sweden, Spain, Italy, Singapore, etc. He founded Biochemical Engineering in India, chaired the department in IIT Delhi until 1985. He inspired huge number of graduate students, teachers and bio-industry professionals in the field of Biotechnology, Bioprocessing and Biofuels for about five decades, until his last day Sep 24, 2019.

The Prof. T.K. Ghose Memorial Award for Best PhD Thesis in Biochemical Engineering and Biotechnology was instituted in the year 2021 and is administered by the Office of Alumni Relations. This is supported by an endowment created from donations by the erstwhile colleagues and students of Prof. T.K. Ghose.

<https://unlimiitd.iitd.ac.in/research/prof-t-k-ghose-endowment/>

Prof. T.K. Ghose Memorial Award 2023



About the award

Prof. T. K. Ghose Memorial Award for Best PhD Thesis in Biochemical Engineering and Biotechnology



About

The Award aims to recognize a student of IIT Delhi whose PhD thesis in Biochemical Engineering and Biotechnology has been adjudged to be the best in that particular year.

Eligibility Criteria

All students who have completed their PhD thesis (including oral defence) in the area of Biochemical Engineering and Biotechnology in the year preceding July 31 of a given year will be eligible for consideration that year.

Selection Process

A selection committee constituted by the Head DBEB, comprising external experts and a nominee of the donors selects the awardee.

Value of the Award and presentation

An amount of Rs 50,000 is awarded as the 'Prof. T. K. Ghose Memorial Award for Best PhD Thesis in Biochemical Engineering and Biotechnology'. The award is presented at a ceremony organised by DBEB in the week following the annual convocation of the Institute.

Prof. T.K. Ghose Memorial Award 2023



Best PhD thesis Awardee



in recognition of his pioneering research work towards enriching a novel microbial consortium and identifying a unique process design for unhindered decolorization performance under extreme conditions. His commendable contributions include deep insight into the enzyme mediated metabolite cascade during dye degradation by this complex consortium followed by translation into an on site pilot scale treatment system "SMAART (Sequential Microbial based Anaerobic-Aerobic Reactor Technology)" operated at industrial premises under ambient conditions (TRL 7). His work explored inner loop recycling of treated effluent, recovered salts, and sludge within the industrial operations and a comparative life cycle assessment of SMAART with existing Activated Sludge system demonstrated significant environmental and health benefits.

Dr. Saurabh Samuchiwal

Ph.D. Center for Rural Development and Technology

Current Position: Research Associate, Applied Microbiology lab, CRDT, IIT Delhi

Development and onsite validation of Sequential Microbial Based Anaerobic-Aerobic Reactor Technology (SMAART) for textile effluent treatment

Textile industries utilize a large amount of water for wet processing operations, thereby releasing huge quantities of effluent in the environment. In these aspects, the research attempted to develop a microbial-based indigenous pilot-scale technology that can efficiently treat the undiluted textile effluent with minimum additives and pretreatments. A novel microbial consortium enriched from Pre-treatment range (PTR) effluent under a unique process design (Joint patent with industry; application no. 201911037941) depicted unhindered performance at higher temperatures (30 - 50 °C) and wide pH range (7-12). An array of techniques was employed to identify key enzymes, crucial functional genes and their corresponding proteins to decipher the enzyme mediated metabolite cascade during dye degradation mechanism by this complex consortium. The consistent performance at lab scale bioreactor (TRL- 4) was translated to on site pilot scale treatment system "Sequential Microbial Consortium Based Anaerobic-Aerobic Reactor Technology (SMAART)" operated at industrial premises under ambient conditions (TRL 7). The consistent results (>94% de colourization) throughout the long-term continuous mode (~1 year) operation established resilience against fluctuations in the inlet parameters and site conditions. A comparative life cycle assessment of SMAART with conventional AS process showed ~41% lesser harmful impact of SMAART. Developed integrations succeeded in creating an inner loop recycling of treated effluent, recovered salts and sludge within the industrial operations that could eliminate the cost incurred for the disposal of toxic salt along with potential recovery of value-added materials. The technology could be extended to various stack holders like textile industries, tannery industries, paper industries resulting in revenue savings and a step closer to zero liquid discharge and achieving the sustainable development goals (SDGs) targets.

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Memorial Award Lecture

Lecture on Application of Biotechnology Solution in Oil Industry



Professor

Senior Director, EIBD, The Energy and Resource Institute (TERI), & Managing Director, ONGC TERI Biotech Ltd (OBTL)

Dr. Banwari Lal

Dr Banwari Lal is currently heading the Environmental and Industrial Biotechnology Division in the capacity of Senior Director at The Energy and Resources Institute (TERI), New Delhi. He is also the Managing Director, ONGC TERI Biotech Ltd (OTBL), which is a joint venture company of ONGC and TERI, incorporated in 2007, under Company Act 1956. His area of interest is Petroleum Biotechnology and has developed three technologies namely "Oilzapper (for bioremediation of oil spill)", "Microbial Enhanced Oil Recovery" and "Prevention of paraffin deposition in oil well tubing and flow lines". All the three technologies are patented and commercialized. These technologies were commercialized through a Company OTBL.

He has 9 patents and published 100 research papers in peer reviewed high impact factor journals, 2 books and many book chapters. Citation of his research papers is 9028, h-index is 40 and i10-index is 175.

He has been bestowed with many national and international awards for development of above technologies viz., Tata Innovation Fellowship Award in 2010 by DBT; PetroFed Innovator of the Year -Team Award in 2009 by MoPNG; Biotech Product Development award in 2008 by DBT; National Research Development Corporation Award in 2005 by DST; National Bioscience Award for Career Development in 2004 by DBT; Biotech Product & Process Development award in 2002 by DBT; All India Biotech Association award in 2001 by All India Biotech Association.

He is member of expert committee, constituted by the Department of Biotechnology, and also a Member of the Board of ONGC TERI Biotech Ltd (OTBL).

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