

SUBHRANGSU SUNDAR MAITRA

Professor, School of Biotechnology, Jawaharlal
Nehru University, New Delhi-110067



+911-26704088/ +91-9650111600

SSM2100@MAIL.JNU.AC.IN, SM2100@JNU.AC.IN

RESIDENCE: 106, UTTARAKHAND, JNU, NEW DELHI-110067, INDIA

RESEARCH AREA

The current research area is to study the degradation of terephthalic acid (TPA) monomer for polyethylene terephthalate (PET) polymer and dibutyl phthalate (BP).

CURRENT INTEREST

Bioprocess optimization, Downstream processing, Computer-assisted bioprocess design and optimization, Bacterial Metagenomics

EDUCATION

Bachelor Of Chemical Engineering (Hons.)	Jadavpur University
Master in Technology (Biotechnology)	Jadavpur University
Doctor of Philosophy	JNU

EXPERIENCE

31-10-2014 to Ongoing	Professor , School of Biotechnology, Jawaharlal Nehru University
31-10-2007 to 31-10-2014	Associate Professor , School of Biotechnology, Jawaharlal Nehru University
30-07-1990 to 31-10-2007	Assistant Professor , School of Biotechnology, Jawaharlal Nehru University

PROJECTS

Project (1): funded by DBT (Department of Biotechnology) Government of India "Simulation facility for scale-up and economic evaluation of biotechnological processes"- 7.2 lakhs

Project (2): funded by UGC (University Grant's Commission) Government of India "Chaotic dynamics in fermentation systems"- 10 lakhs

Project (3): Capacity build-up grant from JNU- 10 lakhs

Project (4): Collaborative metagenomics project DBT- 67.44 lakhs

Project (5): DBT Twinning with IIT Guwahati- 58 lakhs.

CURRICULUM DEVELOPMENT & TEACHING

1. Introduced and taught a course on "Downstream Processing " (2-credits).
2. Taught a course on "Engineering Principles" (2-credits).

IMPOPRTANT SUMMER SCHOOLS & SEMINARS ATTENDED

1. Attended a summer school at I.I.T. Kharagpur, on immobilized Enzymes, Kharagpur.
2. Attended expert lecture series, on "Intelligent controllers" at D.O.E., New Delhi.
3. Attended a conference, on "Model-based predictive control" at Frankfurt, Germany.
4. Attended a course on "Scale-up of Biotechnological Processes" at Cuernavaca, Mexico.
5. Attended a course on "Recombinant Gene Products: expression technologies" at ICGB, New Delhi.
6. Attended a course on "Mammalian cell culture for heterologous gene expression and reporter gene analysis" at ICGB, New Delhi
7. Attended a refresher course in Biotechnology in the academic staff college, JNU.

PUBLICATIONS

1. Aradhana Priyadarsini, Kaustubh Chandrakant Khaire, Lepakshi Barbora, Subhrangsu Sundar Maitra Vijayanand Suryakant Moholkar, "Methane fermentation to methanol (biological gas-to-liquid process) using *Methylobacterium buryatense* 5GB1C" *Journal of advanced manufacturing and processing J Adv Manuf Process.* 2024; 6: e10172 <https://doi.org/10.1002/amp2.10172>
2. Aradhana Priyadarsini, Kaustubh Chandrakant Khaire, Aditya Singh Chauhan, Sachin Kumar, Lepakshi Barbora, Subhrangsu Sundar Maitra, and Vijayanand S. Moholkar "Ultrasound Induced Enhancement of Biological Gas-to-Liquid Process for Methanol Synthesis from Methane using *Methylobacterium buryatense* 5GB1C", *ACS sustainable resource management*, 2024, 1, 1493-1500
3. Aradhana Priyadarshini, Rekha Singh, Lepakshi Barbora, Subhrangsu Sundar Maitra, Vijayananda Suryakant Moholkar "Methanotroph detection and Bioconversion of methane to methanol by enriched microbial consortium from rice field soil" *Bioresources Technology reports* Vol 22 page 101410
4. Vinay Kumar, Neha Sharma, Mridul Umesh, Pritha Chakraborty, Komalpreet Kaur, Lucky Duha, Suma Sarojini, B. Thazeem, Ritu Pasrija, Alisa S. Vangnai, Subhrangsu Sundar Maitra. "Micropollutants characteristics, fate, and sustainable removal technologies for landfill leachate: A technical perspective" *Journal of Water Process Engineering Journal of Water Process Engineering* Volume 53, July 2023, 103649 (I.F. 7.34)
5. Akanksha Verma, Sanjay Kumar, Subhrangsu Sundar Maitra, "Phylogenetic and taxonomic analysis of bacterial communities identified from the methane emission sites using 16S rRNA metagenomic sequencing", January 2023, <http://dx.doi.org/10.21474/IJAR01/16149> (I.F. 7.33).
6. Vinay Kumar, Neha Sharma, Mridul Umesh, Manickam Selvaraj, Badria M., Al-Shehri, Pritha Chakraborty, Lucky Duhan, Shivali Sharma, Ritu Pasrija, Mukesh Kumar Awasthi, Siva Ramakrishna Lakkaboyana, Rodrigo Andler, Amit Bhatnagar, Subhrangsu Sundar Maitra "Emerging challenges for the agro-industrial food waste utilization: a review on food waste Bio refinery" *Bioresource Technology* available online 13 August 2022, 127790 <https://doi.org/10.1016/j.biortech.2022.127790> (I.F. 11.89)
7. Sanjay Kumar, Geetu S. Kumar, Subhrangsu Sundar Maitra, Petr Maly, Pradeep Sharma and Vivek Dhar Dwivedi "Viral informatics: Bioinformatics based solution for managing viral infections" *Briefings in Bioinformatics* 2022 1-36 <https://doi.org/10.1093/bib/bbac326> (I.F. 13.99)
8. Sanjay Kumar, Akanksha Verma, Pardeep Yadav, Sumit Kumar Dubey, Esam Ibraheem Azhar, Subhrangsu Sundar Maitra, Vivek Dhar Dwivedi "Molecular pathogenesis of Japanese encephalitis and possible therapeutic strategies" *Archives of Virology* <https://doi.org/10.1007/s00705-022-05481> published 02june 2022 (I.F 2.243)

9. Sanjay Kumar, Sherif A. El-Kafrawy, Shiv Bharadwaj, S. S. Maitra, Thamir A. Alandijany, Arwa A. Faizo, Aiah M. Khateb, Vivek Dhar Dwivedi, Esam I. Azhar "Discovery of bispecific lead compounds from *Azadirachta indica* against ZIKA NS2B-NS3 Protease and RNA dependent RNA polymerase using molecular simulations" *Molecules* 2022, 27(8), 2562; doi:10.3390/molecules27082562(I.F. 4.41)
10. Hemant Joshi, Divya Kandari, Subhrangsu Sundar Maitra and Rakesh Bhatnagar "Biosensors for detection of *Mycobacterium tuberculosis*: a comprehensive overview" 48(2), 2022, 1-29 DOI: 10.1080/1040841X.2022.2035314 (I.F. 7.3)
11. Sanjay Kumar, Pradipta Paul, Pardeep Yadav, Ridhima Kaul, Subhrangsu Sundar Maitra, Saurabh Kumar Jha, Ali Chari "A multi-targeted approach to identify potential flavonoids against three targets in the SARS-CoV-2 life cycle ". *Computers in Biology and Medicines* 142(2022) 105231 (I.F. 4.6)
12. Vianey Kumar, S. S. Maitra, Dilip Burnwal and Rekha Singh "Acclimatization of a newly isolated bacteria in monomer tere-phthalic acid (TPA) may enable it to attack the polymer polyethylene tere-phthalate (PET) – *The Journal of Environmental Chemical Engineering* (UK), August 2020, volume 8 issue 4 ,103977 doi.org/10.1016/j.jece.2020.103977 (I.F. 5.88)
13. Vinay Kumar, Neha Sharma, S. S. Maitra and Sivarama Krishna Lakkaboyana "In vivo removal of profenofos in agricultural soil and plant growth promoting activity on *Vigna radiata* by efficient bacterial formulation" *International Journal of phytoremediation* Dec 2019 pp1-9 <http://doi.org/10.1080/15226514.2019.1696743> (I.F. 2.28)
14. Bhatnagar Hemant Joshi, Anshu Malik, Nidhi Adlakha, Somya Aggarwal, Manoj Munde, S. S. Maitra, and Rakesh "Detection of phytopathogenic fungal cell wall by polyclonal sera raised against Trimethyl chitosan nanoparticles" – *International Journal of Nanomedicines* Dec. 2019 Vol. 14. pp 10023 -10033 (I.F. 4.88)
15. S. Yadav, Arvind Kumar, Manish Gupta, S. S. Maitra "Cross-reactivity of Prokaryotic 16S rDNA-Specific Primers to Eukaryotic DNA: Mistaken microbial community profiling in environmental samples" -*Current Microbiology* –online 2 April 2018 doi.org/10.1007/s00284-018-1482-4 (75:1038–1045) (I. F. 2.16)
16. Vinay Kumar, Neha Sharma, and S. S. Maitra "In vitro and in vivo toxicity assessment of nanoparticles" *International nano letters* Vol. 7pp243-256 published 25th November 2017 (154 citations)
17. Shailendra Yadav, S. S. Maitra "Molecular detection of Methylophils from an Indian landfill site and their potential for biofuel production" *Global Nest (Network for Environmental Science and Technology)* Vol. 19 No 3 pp 533-539 online Nov 2017 (I.F. 0.99)
18. Vinay Kumar, Neha Sharma and S. S. Maitra "Comparative study on the degradation of dibutyl phthalate by two newly isolated *Pseudomonas* sp. V21b and *Comamonas* sp. 51F" *Biotechnology Reports* Vol. 15 (2017) pp1–10 (I.F. 4.88)
19. Vinay Kumar, S. S. Maitra "Biodegradation of endocrine disruptor dibutyl phthalate by newly isolated *Methylobacillus* sp. V29b and the degradation pathway" *3 Biotech* (2016) 6:200 DOI 10.1007/s13205-016-0524-5 (I.F. 2.27)
20. S. S. Maitra, Vinay Kumar "Efficient degradation of dibutyl phthalate and utilization of Phthalic Acid Esters (PAEs) by *Acinetobacter* species isolated from MSW (Municipal Solid Waste) leachate, *Global Nest (Network for Environmental Science and Technology)* Journal -Vol. 18 No.4 pp817-830 Nov 2016 (IF 0.66)
21. Shailendra Yadav, Sharbaddeb Kundu, Sankar K. Ghosh, and S. S. Maitra "Molecular Analysis of Methanogen Richness in Landfill and Marshland Targeting 16S rDNA Sequences" *Archaea* Vol. 2015, page 1~9. Article ID 563414, <http://dx.doi.org/10.1155/2015/563414> (IF 2.71)
22. Shailendra Yadav, S. S. Maitra, and Sankar K. Ghosh "Cloning and sequencing of Methyl-coenzyme Reductase A (MCR A) gene from methanogenic archaea from landfill" *Science and Technology*

23. S. S. Maitra, Brijesh Kumar, S.K. Ghosh, B.K. Tiwary "Cross-reactivity of prokaryotic 16S rRNA gene-specific primers with genomes from eukaryotic organisms from marshland." Journal of Biology and Nature Vol. 2 issue 2, page 58-68 (Now in PubMed)
24. Shailendra Yadav, S. S.Maitra, Shukla Pal, Neha Singh, S.K. Gupta, S.K. Ghosh, T.R. Sreekishnan "Accumulation of lactic acid during bio-digestion of municipal solid waste leachate and identification of indigenous lactic acid bacteria in leachate." Journal of hazardous and toxic and radioactive waste: (American Society of Civil Engineers) : Published online 6 March 2014 , Print 18(4) October 2014 (R.G. IF 0.74)
25. S. S. Maitra, Vinay Kumar and Rohit Shukla "Metagenomics: The Data Assembly and Data Analysis Perspective" Journal of Institution of Engineers: Section A Environmental Engineering. DOI 10.1007/s40030-014-0102-y paper Vol. 96, issue 1, 2015 page 71-83.
26. Shukla Pal, S.K. Gupta, T R. Sreekrishnan and S.S. Maitra "Determination of physicochemical parameters for prediction of MSW leachate transport through vadose zone by a breakthrough curve in a realistic undisturbed soil column" Journal of Environmental Science and Engineering Vol. 56 No2 April 2014 page179-192
27. Shukla Pal, S.K. Gupta, T R. Sreekrishnan and S.S. Maitra "DNA based methods reveal complex kinetics of MSW leachate anaerobic digestion": Journal of hazardous and toxic and radioactive waste : (American Society of Civil Engineers)Vol. 17 no 2April 1 , 2013 , page 156-162 (R.G. IF 0.74)
28. Shukla Pal, S.K. Gupta, S. S. Maitra, Neha Singh and Gopal Misra "Experimental determination of kinetic parameters for anaerobic digestion of MSW leachate for prediction of contaminant transport through vadose zone" page -45-60, National convention on Biotechnology and the Environment held at NIT Durgapur on 4th and 5th. October 2010
29. S. S. Maitra and Ashok Kumar "Production of the active ingredient of a malaria vaccine as a bulk drug" Journal of the Institution of Engineers (India) Vol. 91 March 2011 page 3-11
30. S. S. Maitra "Chaotic Variation of dissolved oxygen concentration during an antibiotic fermentation" Canadian Journal on Chemical Engineering & Technology Vol. 2 No1 January 2011 Page 60-73
31. S. S. Maitra, Neha Singh, and R. Khatri, Shailendra Yadav, " Effect of temperature variations and inorganic phosphate concentrations upon tetracycline production by Streptomyces aureofaciens - International Journal of Biotechnology and Biochemistry Vol. 10 No.2 October 2014, page 175-185
32. S. S. Maitra, S. Chug and N. Singh, "Semi optimal feed profiles for inorganic phosphate addition in tetracycline fermentation" International Journal of Biotechnology and Biochemistry Vol. 6 No. 2 2010 page. 339–350
33. S. S. Maitra and A.K. Verma, "Process economics of recombinant hepatitis-B vaccine production in India" The Indian Chemical Engineer, Section B, Vol. 47, No 3 July –September 2005 page 189-194
34. S.S. Maitra, "A new model for batch penicillin fermentation" Journal of the Institution of Engineers (India). Vol. 84 March 2004 page 59-64
35. S. S. Maitra and A.K. Verma, "Comparative study of g-interferon production between E.coli and CHO cell-based systems at 10-liter fermenter level" The Indian Chemical Engineer, Section A, Vol.45, No 3 July –August 2003 page 35-40
36. S. S. Maitra and A.K. Verma, " End of small volume high-value myth in Biotechnology: Process design for a mega-plant producing g- interferon for mega profit" Journal of the Institution of Engineers (India). Vol.84 September 2003 page 17-24.
37. S. S. Maitra and Vinod Kumar, "Semi -optimal substrate feed-profiles for penicillin fermentation using hybrid bubble sort chemotaxis algorithm " Indian Chemical Engineer Vol 44 No2 April-June

2002 page 94 -99.

38. S. S. Maitra, "Control of various chemical reactors by inverse modeling of the systems using feed-forward backpropagation neural networks" Journal of the Institution of Engineers Vol. 82 September 2001 page 1-8.
39. S.S. Maitra, "Operating cost optimization of genetically engineered bio-products using hybrid chemotaxis bubble sort algorithm" Journal of the Institution of Engineers, Vol. 77, March 1997, page 54-60.
40. S.S. Maitra, "On-line Biosensors for Penicillin fermentation". Indian Chemical Engineer, section B Vol. 37, No.3. July-Sep. 1995, page 61-66.
41. S.S. Maitra, "Pellet Efficiency a review", Journal of the Institution of Engineers (Chemical Engineering division /Series E). Vol.74, March 1994, page 64-66.

BOOK CHAPTERS

1. Vinay Kumar , Sivarama Krishna Lakkaboyana , Neha Sharma, Ali Samy Abdellaal , Subhrangsu Sundar Maitra and Deepak Pant "Engineered nanomaterials uptake , bioaccumulation and toxicity mechanisms in plants" Chapter Four Comprehensive Analytical Chemistry , 2019 Volume 87 pp 111-131 (ISSN No 0166-526X) <https://doi.org/10.1016/B978-0-12-817830-0.00009-6> V
2. Vinay Kumar, Sivarama Krishna Lakkaboyana, Neha Sharma, Subhrangsu Sundar Maitra "Nanotoxicology and its Remediation" 29th March 2020, Intelligent Nanomaterials for Drug delivery, Elsevier Chapter 9 pp 163-178, <https://doi.org/10.1016/bs.coac.2019.09.005>
3. Kumar V, Maitra SS, Sharma N. Chapter 12: Protein and peptide nanoparticles: Preparation and Surface Modification. Functionalized Nanomaterials I Fabrications. Editors: Vineet Kumar, Praveen Guleria, Nandita Dasgupta, Shivendu Ranjan. Aug 10, 2020. Publisher: Taylor and Francis
4. Vinay Kumar, Neha Sharma, Sivarama Krishna Lakkaboyana and Subhrangsu Sundar Maitra "Silver nano-particles in poultry health application and toxicokinetic effects" Chapter 28 Nanobiotechnology for plant protection : Silver nanomaterial for Agri-food application : Ed Kamel A. Abd -Eslam Elsevier <https://doi.org/10.1016/B978-0-12-823528-7.00005-6>
5. Chapter 9: Wood biomass valorization for value added chemicals Neha Sharma, Vinay Kumar, Subhrangsu Sundar Maitra*
6. Nisha Gaur, Ravish Chowdhary, Dilip Brunwal, Rekha Singh, and S S Maitra "Degradation of Plastic in Environment and Its Implications with Special Reference to Aromatic Polyesters" C. M. Hussain (ed.), Handbook of Environmental Materials Management Springer Nature Switzerland AG 2020 DOI: 10.1007/978-3-319-58538-3_176-1

SCIENTIFIC ACHIEVEMENTS

1. Development of hybrid bubblesort Chemotaxis algorithm for Bioprocess optimization.
2. Highlighted the need of Prokaryote Eukaryotic DNA enrichment/separation for 16-S r-RNA based methods in metagenomics. Achieved enrichment in Lab.
3. Separated many bacteria for Terephthalic acid degradation.
4. Separated a Polyethylene terephthalate (PET polymer) attacking bacteria Second after *Ideonella sakaiensis*.
5. New paradigm in plastic eating bacteria research – Growing the bacteria in monomer enables it to attack the polymer.

Basic Scientific question: Can a bacterium be trained?