Dr. Sundar S K

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Objective:

To pursue an opportunity in research/teaching in a reputed concern by making long term commitment through which I can dedicate my technical skills for the growth of the organisation and willingness to walk an extra mile to achieve level of excellence.

Teaching Experience:

- a) Assistant Professor, Department of Chemical Engineering, SVNIT (2019 onwards).
- b) Associate Professor, Department of Chemical Engineering, KARE (2018-2019).
- c) Assistant Professor-III (Sr.), Department of Chemical Engineering, KARE (2017-2018).
- d) Assistant Professor, Department of Chemical Engineering, PMIST (2015-2017).

Research Experience:

PhD Research Work

Indian Institute of Technology Bombay, Mumbai, Maharashtra

Title of Research work: Self Assembly and Dewetting of Lipid Bilayers.

Supervisor: Prof. Mahesh Tirumkudulu.

The research work focused on interdisciplinary topic involving the principles of chemical engineering, colloids and interfacial science, biotechnology and material chemistry to develop a novel methodology for liposome synthesis through self-assembly via hydration inside microfluidic channels and to develop a device that could be operated in a continuous mode to produce sub-100-nm liposome formulation in a single step while encapsulating a bioactive ingredient.

In order to understand the mechanism of liposome formation by hydration, we have examined the behaviour of lipid bilayer (coated over glass substrate) under the influence of intermolecular forces at the interface.

<u>Practical application</u>: The liposome has been exploited for numerous applications such as penetration enhancer in cosmetics, encapsulation of micronutrients, flavours/fragrance, food industry, and most commonly for encapsulating drugs for targeted delivery.

Research Assistant cum Lab Instructor

Institute of Bioinformatics and Applied Biotechnology (IBAB),

Bangalore, Karnataka.

Research work: Lysozyme kinetics

Lysozyme kinetics was evaluated using Micrococcus luteus cells as substrate.

Industrial Trainee – Sponsored by DBT, Govt. of India.

Oncophyta Labs Private Limited,

Madurai, Tamilnadu

M.Tech Dissertation

National Environmental Engineering Research Institute,

Nagpur, Maharashtra.

<u>Title of Research work:</u> Bioremediation/Phytoremediation of wastewater containing high organics to reduce pollution using plant-based enzymes.

The purpose of the research work was to reduce the environmental pollution caused due to industrial wastewater. The investigation was done on dairy wastewater along with the recovery of volatile fatty acids from the effluent. Pre-treatment involves analyzing the COD and BOD of wastewater and post-treatment was carried out using plant-based enzymes (oxidoreductases).

Externally Funded Research Projects:

S.No.	Project title	Duration	Role	Sponsoring Agency
1	Synthesis and rheological characterization of liposome stabilized emulsion-hydrogel matrix for controlled release of essential oil	3 years (May 2022 onwards)	PI	GUJCOST
2	Development of drug delivery systems based on phase change materials	3 years (Feb 2022 onwards)	Co- PI	DST-SERB

Education:

S.No.	Degree	College	% /
			CGPA
1	Ph.D Chemical Engineering	IIT Bombay	8.25
2	M.Tech Biotechnology	CBT, Anna University	7.9
3	B.Tech	Shanmugha College of	79.19 %
	Chemical Engineering	Engineering	
4	Higher Secondary (XII th)	TVS Lakshmi Mat. Hr. Sec.	85.25 %
		School	
5	AISLC (X th)	Railway Mixed Hr. Sec. School	81.6 %

Conference/Workshop/FDP:

- Presented a poster "Synthesis of liposomes from dried multilamellar layers of lipid in a thin capillary" in Research Scholars' Symposium and awarded Best Poster Prize (2011).
- Participated in the American Chemical Society Colloids and Surface Science Symposium held in University of California from 23rd - 26th June 2013, presentation on "Nanometer range liposome synthesis via hydration in packed beds." (International travel grant provided by Department of Biotechnology, GOI, India.)
- Attended Faculty Development Programme on "How to Bring Creativity in Students" and "Question Paper Setting" organized by PMIST (2015).
- Attended Faculty Development Programme on "Teaching and Learning" organized by PMIST (2017).

- Coordinator for Faculty Development Programme on "Application of Chemical Engineering Principles in Biotechnology" in KARE (2017).
- Attended one day workshop on "Entrepreneurship cum new product development" organized by KARE (2017).
- Coordinator for National Level Technical Symposium combined with workshop on "Bioreactors-Operation and Maintenance" KARE (2018).
- Poster presentation on "Removal of pharmaceuticals from water by adsorption on carbon derived from agricultural waste materials" A. Ganesh, Dr. Sujata Mandal (CLRI, Chennai) & Dr. S.K. Sundar. ICORTAC 2018 held in University of Madras (2018)
- Coordinator for Faculty Development Programme on "Research Scenario in Chemical Engineering" KARE (2018).
- Mentor for students' project on "Power from waste using microbial fuel cell". The students received financial support of Rs. 4000 from KARE.
- Attended Faculty Development Programme on "Design of Experiment and Artificial Neural Network" organized by SVNIT, Surat (2019).
- Coordinator for STTP on "Recent Trends in Energy and Environment" organized by Department of Chemical Engineering, SVNIT, Surat (2020).
- Coordinator for STTP on "Risk Assessment and Management in Process Industries" organized by Department of Chemical Engineering, SVNIT, Surat in collaboration with MMMUT, Gorakhpur (2020).
- Coordinator for International Conference (virtual) on "Green Chemistry and Engineering towards Sustainable Development-An Industrial Perspective (GCESDIP)" organized by Department of Chemical Engineering, SVNIT, Surat (2021).
- Coordinator for National Conference (virtual) on "Recent Advance in Chemical Engineering towards Sustainable Future" organized by Department of Chemical Engineering, SVNIT, Surat (2022).
- Attended National Level Workshop on "Curriculum Framework 2022 for Universities, Engineering Colleges and Degree Colleges" for implementation of NEP by Institute of Academic Excellence, Hyderabad (2022).
- Coordinator for organizing ten days NAIP (National Academic Immersion Program) program for students of MIT-WPU Pune, at SVNIT, Surat (2024).

- Coordinator for STTP on "Pharmaceutical Applications of Chemical Engineering" organized by Department of Chemical Engineering, SVNIT, Surat (2024).
- Attended Faculty Development Programme on "Recent Pedagogies for Better Learning" organized by SVNIT, Surat (2024).
- Coordinator for STTP on "Emerging Trends in Agro-Tech and Food Processing Towards Greener Future" organized by Department of Chemical Engineering, SVNIT, Surat (2025).

PhD Supervision (Ongoing):

S.No.	Student Name	Research area	Role	Year
1	Mr. Miraj Savani	Drug delivery systems	Co-Supervisor	2022
2	Ms. Unnati Patel (Part-time), Assistant Professor, Parul Univeristy.	Biopolymers	Supervisor	2024

Membership in Professional Bodies:

(a) Member of 'Indian Institute of Chemical Engineers' (No. LAM61447)

(b) Member of 'The Institution of Engineers' (No. AM170254)

Publications (SCI/Scopus):

Journal Publication:

a) Sundar, S.K. & Tirumkudulu, M.S. Synthesis of sub-100nm liposomes via hydration in a packed bed of colloidal particles. Industrial and Engineering Chemistry Research, 53(1), 198-205 (2014)

b) Sundar, S.K. & Parikh, J.K. Advances and trends in encapsulation of essential oils. International Journal of Pharmaceutics. 635, 122668 (2023)

c) Khare, S., Sundar, S.K. & Gohel, J.V. Advanced materials to overcome the challenges in

the fabrication of stable and efficient perovskite solar cells by additive engineering: a review. Journal of Materials Science, 58, 16565–16590 (2023).

d) Bhavsar, K., Sundar, S.K. & Parikh, J. Hydrogenation of xylose to xylitol: interactive parametric, optimization and kinetic study. Chemical Papers (2025).

Book Chapters:

- a) Sundar, S.K. & Tirumkudulu, M.S., "Novel Method for Synthesizing Monodisperse Dispersion of Nanometer Liposomes", Book Chapter in "Nanoscale and Microscale Phenomena: Fundamentals and Applications", Springer Publications.
- b) Sundar, S.K. & Tirumkudulu, M.S., "Dewetting and hole formation in spin-coated films of lipid bilayers", Book Chapter in Nanoscale and Microscale Phenomena: Fundamentals and Applications, Springer Publications.
- c) Sundar, S.K. & Solanki, J. "Anticorrosion Coating Using Natural Biopolymer" Book Chapter in "Functional Coatings: Innovations and Challenges" John Wiley & Sons.
- d) Mehta, D., Sundar, S.K., Parikh, J.K. Mehra, A., Thapliyal, D. & Arya, R.K. "Food Waste Biorefinery", Book Chapter in "From Waste to Wealth", Springer Publications.
- e) Gupta, S. & Sundar, S.K. "Kinetics of Microbial Growth, Substrate Consumption and Product Formation", Book chapter in "Recent Advances in Bioprocess Engineering and Bioreactor Design", Springer Publications.

Patent (Process):

a) Sundar, S.K. & Tirumkudulu, M.S, "Single pass process for synthesizing sub-100 nm liposomes from packed bed of colloidal particles" (Patent No: 348361).

Patent (Design):

 a) S.K. Sundar, Jigisha K. Parikh and Savani Mirajbhai Dineshbhai, "Coaxial Syringe with Hydrodynamic Focusing for Advanced Microfluidic Applications" (Design No. 433137-001)