

Short CV of Samrat Mukhopadhyay

Prof. (Dr.) Samrat Mukhopadhyay, PhD, FASc, FNA

Professor of Biology & Chemistry and JC Bose Fellow

Indian Institute of Science Education and Research (IISER) Mohali, Punjab, India.

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Lab Website: <https://www.MukhopadhyayLab.org> Academic Twitter: [@SamratLabMohali](https://twitter.com/SamratLabMohali)

Research Interests

Biophysics and Chemical Biology: Intrinsically Disordered Proteins; Prions; Amyloids; Biological Condensates; Phase Separation; Fluorescence & Raman Spectroscopy and Microscopy; Single-Molecule and Nanoscale Biology

Positions

- October 2020 - present: Professor, IISER Mohali
- July 2021 – June 2024: Head, Department of Biological Sciences, IISER Mohali
- September 2013 - October 2020: Associate Professor, IISER Mohali
- December 2008 - September 2013: Assistant Professor, IISER Mohali

Education and Training

- Postdoctoral Research Associate, The Scripps Research Institute, La Jolla, California, USA (Molecular Biology) (2005-2008)
- Visiting Fellow, Tata Institute of Fundamental Research (TIFR), Mumbai (Molecular Biophysics) (2004-05)
- Ph.D. Indian Institute of Science (IISc), Bangalore (Organic Chemistry) (2000-2004)
- M.S. (Integrated PhD): Indian Institute of Science (IISc), Bangalore (Chemical Sciences) (1997-2000)
- B.Sc. Jadavpur University, Kolkata (Calcutta) (Honors in Chemistry, Physics, Mathematics, Computer Science) (1994-1997)

Honors and Professional Recognition (selected)

- Recipient of the J. C. Bose Fellowship (2024).
- Fellow, Indian National Science Academy (2024)
- Fellow, Indian Academy of Sciences, Bangalore (2023)
- Chair-Elect, Intrinsically Disordered Proteins subgroup of the Biophysical Society (USA)
- Editorial Board Member, *Biophysical Journal* (Cell Press) (2020-present).

Representative Publications

- "Intermolecular Energy Migration via HomoFRET Captures the Modulation in the Material Property of Phase-Separated Biomolecular Condensates" A. Joshi, A. Walimbe S. Sarkar, L. Arora,...I. Banerjee & S. Mukhopadhyay*. *Nature Communications* (2024) 15, 9215. [Link](#)
- "Single-Molecule FRET Unmasks Structural Subpopulations and Crucial Molecular Events During Phase Separation of a Prion-Like Low-Complexity Domain" A. Joshi, A. Walimbe, A. Avni, ... & S. Mukhopadhyay* *Nature Communications* (2023) 14, 7331. [Link](#)
- "Heterotypic electrostatic interactions control complex phase separation of tau and prion into multiphasic

condensates and co-aggregates" S. K. Rai, R. Khanna, A. Avni & S. Mukhopadhyay* *Proc. Natl. Acad. Sci. USA* (2023) 120, e2216338120. [Link](#)

- "Molecular Origin of Internal Friction in Intrinsically Disordered Proteins" D. Das* & S. Mukhopadhyay* *Acc. Chem. Res.* (2022), 55, 3470-3480. [Link](#)
- "Single-Droplet Surface-Enhanced Raman Scattering Decodes the Molecular Determinants of Liquid-Liquid Phase Separation" A. Avni, A. Joshi, A. Walimbe, S. G. Pattanashetty & S. Mukhopadhyay* *Nature Communications* (2022), 13, 4378. [Link](#)
- "Sub-stoichiometric Hsp104 regulates the genesis and persistence of self-replicable amyloid seeds of Sup35 prion domain" S. Mahapatra, ... S. Mukhopadhyay* *J. Biol. Chem.* (2022) 298, 102143. [Link](#)
- "Spatiotemporal Modulations in Heterotypic Condensates of Prion and α -Synuclein Control Phase Transitions and Amyloid Conversion" A. Agarwal, L. Arora, S.K. Rai, A. Avni & S. Mukhopadhyay* *Nature Communications* (2022) 13, 1154. [Link](#)
- "Short-Range Backbone Dihedral Rotations Modulate Internal Friction in Intrinsically Disordered Proteins" D. Das, L. Arora & S. Mukhopadhyay* *J. Am. Chem. Soc.* (2022) 144, 1739-1747. [Link](#)
- "An intrinsically disordered pathological prion variant Y145Stop converts into self-seeding amyloids via liquid-liquid phase separation" A. Agarwal, S.K. Rai, A. Avni & S. Mukhopadhyay* *Proc. Natl. Acad. Sci. USA* (2021) 118, e2100968118. [Link](#)
- "Intermolecular Charge-Transfer Modulates Liquid-Liquid Phase Separation and Liquid-to-Solid Maturation of an Intrinsically Disordered pH-Responsive Domain" P. Dogra, A. Joshi, A. Majumdar & S. Mukhopadhyay* *J. Am. Chem. Soc.* (2019) 141, 20380-20389. [Link](#)

Invited lectures (selected from > 100 invited seminars and conference talks)

International: Invited talks at the FASEB Conference (Dublin, Ireland, June 2023), Gordon Research Conference (Les Diablerets, Switzerland, June 2022), "New and Notable" lecture (Biophysical Society meeting, San Francisco, 2022), etc. Invited seminars at Stanford University, University of California San Diego, University of California Santa Barbara, ETH Zurich, EPFL Lausanne, EMBL Heidelberg, Scripps Research Institute, Washington University, University of Melbourne, University of Cambridge, Federal University of Rio de Janeiro, Kobe University, Indian Institute of Science, Bangalore, India Institute of Technology, Bombay, etc.

A complete CV can be found [here](#).