

Stanford



Samsuzzoha Mondal

Research Assoc-Experimental, SLAC National Accelerator Laboratory

Bio

BIO

Samsuzzoha Modal is a Research Associate at SLAC National Accelerator Laboratory and a Ph.D. chemist specializing in advanced microscopy and biophysical chemistry. His research integrates protein engineering, structural biology, and quantitative imaging to understand how protein organization across length scales regulates biological activity, and to translate these mechanistic insights into therapeutic and diagnostic approaches.

Samsuzzoha earned his Ph.D. at the Tata Institute of Fundamental Research (Mumbai, India), where he developed chemical tools to image signaling phospholipid dynamics in live biological systems. He then completed postdoctoral training at the University of Pennsylvania (Philadelphia), building in vitro reconstitution models to study the molecular basis of membrane trafficking. Since 2023 at SLAC, he has been combining X-ray crystallography, small-angle X-ray scattering, and advanced optical methods to uncover design principles for quantum biosensing tools and to support structure-guided small-molecule therapeutic development.

A committed educator and mentor, Samsuzzoha has taught bioanalytical chemistry and led diverse student teams, emphasizing inclusive, hands-on training, reproducible data practices, and translational problem-solving.

EDUCATION AND CERTIFICATIONS

- Ph.D., Tata Institute of Fundamental Research, Mumbai, India
- M.Sc., Indian Institute of Technology Kharagpur, India
- B.Sc., University of Burdwan, West Bengal, India

Professional

WORK EXPERIENCE

- Postdoctoral Researcher - University of Pennsylvania
- Research Associate - SLAC National Accelerator Laboratory, Stanford University

Publications

PUBLICATIONS

- **Magnetic resonance control of spin-correlated radical pair dynamics in vivo.** *Nature*
Burd, S. C., Bagheri, N., Condon, A. F., Ingaramo, M., Mondal, S., Dowlatshahi, D. P., Summers, J. A., Mukherjee, S., York, A. G., Wakatsuki, S., Boxer, S. G., Kasevich, M.
2026

- **Endophilin-lamellipodin-VASP, key components in fast endophilin-mediated endocytosis, control actin polymerization within liquid-like condensates.** *The Journal of biological chemistry*
Narayan, K. B., James, H. P., Cope, J., Mondal, S., Baeyens, L., Milano, F., Zheng, J., Krause, M., Baumgart, T.
2025; 301 (12): 110834
- **Detection of PIP2 distributions in biological membranes using a peptide-based sensor.** *The Journal of biological chemistry*
Menon, V. K., Wu, J., Alonzo, A. J., Scrudders, K. L., Rogers, K. A., Selvarajan, S., Walke, A., Pellicier-Caraballo, J., Kundu, R., Mondal, S., Datta, A., Low-Nam, S. T.
2025: 110826
- **A cell-permeable fluorescent probe reveals temporally diverse PI(4,5)P2 dynamics evoked by distinct GPCR agonists in neurons.** *Chemical science*
Kundu, R., Mondal, S., Kapadia, A., Banerjee, A. A., Kucherak, O. A., Klymchenko, A. S., Koushika, S. P., Venkatramani, R., Vaidya, V. A., Datta, A.
2025; 16 (24): 10970-10982
- **Magnetic resonance control of reaction yields through genetically-encoded protein:flavin spin-correlated radicals in a live animal.** *bioRxiv : the preprint server for biology*
Burd, S. C., Bagheri, N., Ingaramo, M., Condon, A. F., Mondal, S., Dowlatshahi, D. P., Summers, J. A., Mukherjee, S., York, A. G., Wakatsuki, S., Boxer, S. G., Kasevich, M.
2025
- **Purification of Recombinant Human Amphiphysin 1 and its N-BAR Domain.** *Bio-protocol*
Mondal, S., James, H. P., Milano, F., Jin, R., Baumgart, T.
2023; 13 (12): e4699
- **Membrane reshaping by protein condensates.** *Biochimica et biophysica acta. Biomembranes*
Mondal, S., Baumgart, T.
2023; 1865 (3): 184121
- **Complex multivalent protein interactions involving endophilin, lamellipodin and VASP regulate membrane shaping phenomena and actin assembly**
Narayan, K. B., Mondal, S., James, H., Baeyens, L., Zheng, J., Baumgart, T.
CELL PRESS.2023: 483A
- **Phase separation can regulate membrane curvature generation by bar-proteins**
Mondal, S., Narayan, K., Baumgart, T.
CELL PRESS.2023: 30A
- **Multivalent interactions between molecular components involved in fast endophilin mediated endocytosis drive protein phase separation.** *Nature communications*
Mondal, S., Narayan, K., Botterbusch, S., Powers, I., Zheng, J., James, H. P., Jin, R., Baumgart, T.
2022; 13 (1): 5017
- **Endophilin recruitment drives membrane curvature generation through coincidence detection of GPCR loop interactions and negative lipid charge.** *The Journal of biological chemistry*
Mondal, S., Narayan, K. B., Powers, I., Botterbusch, S., Baumgart, T.
2021; 296: 100140
- **A Bishydrated, Eight-Coordinate Gd(III) Complex with Very Fast Water Exchange: Synthesis, Characterization, and Phantom MR Imaging** *CHEMISTRYSELECT*
Phukan, B., Malikidogo, K. P., Bonnet, C. S., Toth, E., Mondal, S., Mukherjee, C.
2018; 3 (27): 7668-7673
- **Optically sensing phospholipid induced coil-helix transitions in the phosphoinositide-binding motif of gelsolin.** *Faraday discussions*
Mondal, S., Chandra, A., Venkatramani, R., Datta, A.
2018; 207 (0): 437-458
- **Cell Permeable Ratiometric Fluorescent Sensors for Imaging Phosphoinositides.** *ACS chemical biology*
Mondal, S., Rakshit, A., Pal, S., Datta, A.
2016; 11 (7): 1834-43

- **Molecular crowding causes narrowing of population heterogeneity and restricts internal dynamics in a protein** *METHODS AND APPLICATIONS IN FLUORESCENCE*
Mondal, S., Kallianpur, M. V., Udgaonkar, J. B., Krishnamoorthy, G.
2016; 4 (1)
- **Smart "lanthano" proteins for phospholipid sensing.** *Inorganic chemistry*
Gupta, S., Mondal, S., Mhamane, A., Datta, A.
2013; 52 (21): 12314-6