

Dr. Barun Kumar Maity

The Chong Laboratory, Division of Chemistry and Chemical Engineering, Caltech, USA

Personal Information

Birth date: 24th April 1989

Sex: Male

Birthplace: Tamluk, West Bengal, India

Nationality: Indian

Marital status: Single

Email: smbkumar1989@gmail.com / barun@caltech.edu

Phone No: +1 217 979 9237

Academic Education

Aug. 2011 - May 2013 M.Sc. in Chemistry from IIT Kanpur (IITK), India

July 2008 - July 2011 B.Sc. in Chemistry (Honors) from Ramakrishna Mission Residential College, Narendrapur, University of Calcutta, India

Research Experience

Sept. 2022 - present Postdoctoral fellow in the group of Prof. Shasha Chong, Division of Chemistry and Chemical Engineering, Caltech, USA

Aug. 2019 - Aug. 2022 Postdoctoral fellow in the group of Prof. Paul Selvin, Department of Physics, University of Illinois at Urbana-Champaign, USA

Aug. 2013- Sept. 2019 Ph. D. in Chemistry under the supervision of Prof. Sudipta Maiti, Department of Chemical Sciences, TIFR, Mumbai, India
Thesis title: *Conformation, dynamics, and cellular interaction of amyloid peptides*

Dec. 2012 - May 2013 Master thesis under the supervision of Prof. Pratik Sen, IIT Kanpur, India
Thesis title: *Spectroscopic study of 1-(Dimethoxymethyl)-9H-pyrido[3,4-b]-3-yl-methanol: A new pH indicator*

Research Interests

- ❖ Protein Biophysics, Single Molecule Imaging, Super-resolution Microscopy (PAINT, STORM and PALM)
 - ❖ Liquid-liquid Phase Separation, Biomolecular Condensates, Transcription Regulation
 - ❖ Developing Advanced Super-resolution Microscopy and Nanoscopy Imaging Methods, and Building Spectroscopy and Microscopy Instruments
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Awards, Honors, and Others

- ❖ Sarojini Damodaran Fellowship, TIFR, India for attending Biophysical Society Meeting, USA in 2018
 - ❖ Biophysical Society Travel Award in 2018
 - ❖ **Best poster award** in a conference, "International Conference on Intrinsically Disordered Proteins", 2017, at IISER Mohali, India
 - ❖ **Best poster award** in a conference, "National Workshop on Fluorescence and Raman Spectroscopy FCS 2017", at IIT Guwahati, India
 - ❖ **Travel Award** for attending International Conference, "International Symposium on Protein Misfolding Diseases (ISPMD 2017)," from Department of Biotechnology, India in 2017
 - ❖ Innovation in Science Pursuit for Inspired Research (**INSPIRE**) fellowship for being among the top 1% students in the Higher Secondary (2008) and B.Sc. (2011) Examinations in India (2008-2013).
 - ❖ **5th rank (All India)** in the Joint Admission Test for M.Sc. (IIT-JAM) conducted by IIT Delhi in 2011.
 - ❖ **52nd rank (All India)** in Graduate Aptitude Test in Engineering (GATE) conducted by IIT Bombay in 2013.
 - ❖ **19th rank (All India)** in National Eligibility Test (NET) conducted by the Council of Scientific and Industrial Research (CSIR), New Delhi, India in June 2012.
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Research Publications

https://scholar.google.com/citations?user=u0_W_TIAAAAJ&hl=en&oi=ao

(No of publications made in refereed journals: 18; Conference proceedings: 1; 1st author: 9; Corresponding author: 2)

Publications made in refereed journals

- Postdoc**
1. **B. K. Maity**, D. Nall, Y. J. Lee and P. R. Selvin*, Peptide-PAINT using a transfected-docker enables live- and fixed-cell super-resolution imaging, *Small Methods*, **2023**, *7*, 2201181, 1-8. [IF: 15.4]
 2. Y. Youn, G. W. Lau, Y. Lee, **B. K. Maity**, E. Gouaux, H. J. Chung, P. R. Selvin*, Quantitative live-cell DNA-PAINT imaging of AMPA receptor in live neurons, *Cell Rep.*, **2023**, *3*, 100408, 1-8. [IF: 10.0]
 3. S. Shukla, A. Troitskaia, N. Swarna, **B. K. Maity**, M. Tjioe, C. S Bookwalter, L. Chrin, C. L. Berger, K. M. Trybus, Y. R. Chemla, P. R. Selvin*, High-throughput force measurement of individual kinesin-1 motors during multi-motor transport, *Nanoscale*, **2022**, *14* (34), 12463-12475. [IF: 8.3]
 4. S. R. Yoshida, **B. K. Maity**, and S. Chong*, Visualizing Protein Localizations in Fixed Cells: Caveats and the Underlying Mechanisms. *J. Phys. Chem. B*, **2023**, *127* (19), 4165-4173. [IF: 3.5]
 5. L. Chen*†, Z. Zhang†, Q. Han#, **B. K. Maity**#, L. Rodrigues, E. Zboril, R. Adhikari, S. H. Ko, X. Li, S. R. Yoshida, P. Xue, E. Smith, K. Xu, Q. Wang, T. H. Huang, S. Chong*, Z. Liu*, Hormone-induced enhancer assembly requires an optimal level of hormone receptor multivalent interactions. *Molecular Cell*, **2023**, *83*, 1-19. [19.3] (†, # contributed equally)
- Ph.D.**
1. **B. K. Maity**†, A. K. Das†, S. Dey, U. K. Moorthi, A. Kaur, A. Dey, D. Surendran, R. Pandit, M. Kallianpur, B. Chandra, M. Chandrakesan, S. Arumugam*, and S. Maiti*, Ordered and Disordered Segments of Amyloid- β Drive Sequential Steps of the Toxic Pathway, *ACS Chem. Neurosci.* **2019**, *10*, *5*, 2498–2509. († contributed equally) [IF: 5.8]
 2. B. Chandra†, **B. K. Maity**†, A. Das and S. Maiti*, Fluorescence quenching by lipid encased nanoparticles shows that Amyloid- β has a preferred orientation in the membrane, *Chem. Commun.*, **2018**, *54*(56), 7750-7753. († contributed equally) [IF: 6.0]
 3. A. K. Das†, **B. K. Maity**†, U. Tripathy*, and S. Maiti*, Label-free Ratiometric Imaging of Serotonin in Live Cells, *ACS Chem. Neurosci.*, **2017**, *8* (11), 2369–2373. († contributed equally) [IF: 5.8]
 4. **B. K. Maity**, V. Vishvakarma, D. Surendran, A. Rawat, A. Das, S. Pramanik, N. Arfin, and S. Maiti*, Spontaneous Fluctuations Can Guide Drug Design Strategies for Structurally Disordered Proteins, *Biochemistry*, **2018**, *57* (28), 4206–4213. [IF: 3.3]

5. **B. K. Maity**, and S. Maiti*, Label-free Imaging of Neurotransmitters in Live Brain Tissue by Multi-photon Ultraviolet Microscopy, *Neuronal Signaling*, 2018, 2 NS20180132, 1-8. [IF: 3.6]
6. **B. K. Maity***, D. S. Roy, S. Maiti*, Real time imaging of the excitation volume of a multiphoton microscope, *J. Opt.*, 2022, 24 (064012), 1-7. [IF: 2.5]
7. **B. K. Maity**, A. Das, S. Dutta, and S. Maiti*, Design and Construction of a Line-Confocal Raman Microscope for Sensitive Molecules, *Proc. Natl. Acad. Sci., India, Sect. A Phys. Sci.*, 2018, 88(3), 431–436. [IF: 0.7]
8. S. Dey, D. Surendran, O. Engberg, A. Gupta, S. E Fanibunda, A. Das, **B. K. Maity**, A. Dey, V. Visvakarma, M. Kallianpur, H. A Scheidt, G. Walker, V. A Vaidya, D. Huster, S. Maiti*, Altered Membrane Mechanics Provides a Receptor Independent Pathway for Serotonin Action, *Chem. Euro. J.*, 2021, 27 (27), 7533-7541. [IF: 5.0]
9. A. Rawat, **B. K. Maity**, B. Chandra, A. Das, and S. Maiti*, Aggregation-induced conformation changes dictate islet amyloid polypeptide (IAPP) membrane affinity, *BBA-Biomembranes.*, 2018, 1860 (9) , 1734-1740. [IF: 4.0]
10. K. Bera, A. K. Das, A. Rakshit, B. Sarkar, A. Rawat, **B. K. Maity** and S. Maiti*, Fluorogenic Detection of Monoamine Neurotransmitters in Live Cells, *ACS Chem. Neurosci.*, 2018, 9(3), 469-474. [IF: 5.8]
11. B. Chandra†, A. Korn†, **B. K. Maity**, J. Adler, A. Rawat, M. Krueger, D. Huster, and S. Maiti*, Stereoisomers Probe Steric Zippers in Amyloid- β , *J. Phys. Chem. B*, 2017, 121 (8), 1835–1842. († contributed equally) [IF: 3.5]
12. B. Chandra†, D. Bhowmik†, **B. K. Maity**, K. Mote, R. Venkatramani*, S. Maiti* and P. K. Madhu*, Secondary Structure Flipping Associated with Salt-bridge Formation Converts Amyloid- β oligomers to Fibrils, *Biophys. J.*, 2017, 113 (4), 805-816. († contributed equally) [IF: 4.0]
13. K. Bera, **B. K. Maity**, M. Nag, M. O. Akram and S. Basak*, Photophysical effects of nitric oxide and S-nitrosocysteine on acridine orange: use as sequential sensing platform for NO, cysteine, cysteine–NO and Hg²⁺ under physiological conditions, *Anal. Methods*, 2014, 6, 347-350. [IF: 3.5]

Publications made in conference proceedings

14. **B. K. Maity***, S. Maiti*, Real time imaging of the detection volume of a confocal microscope, *Proc. SPIE 11244, Multiphoton Microscopy in the Biomedical Sciences XX*, 112441D (14 February 2020); <https://doi.org/10.1117/12.2544129>

**Corresponding author*

Invited Talks

- ❖ Conformation, Positioning in Membrane and Fluctuations of Intrinsically Disordered Protein (IDP) Oligomers, 2017, Universität Leipzig, Institut für Medizinische Physik und Biophysik, Germany
 - ❖ Dynamics based drug design for intrinsically disordered proteins, 2017, Biophysics Pachim, IISER Pune, India
 - ❖ Role of ordered and disordered part of amyloid beta-40, 2019, TIFR-Weizmann Interaction Meeting, TIFR, Mumbai, India
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Mentoring Experience & Professional Memberships

- ❖ Mentored three Ph.D. students for their coursework projects, and three M.Sc. project at TIFR, Mumbai, and one BS student at UIUC, USA
- ❖ Reviewed manuscripts for ACS (Analytical Chemistry, Nano Letters), RSC (RSC Advances), EMBO (The EMBO Journal), Wiley (The FEBS Journal), Cell press (Cell Reports), eLife, and MDPI (Biomolecules, molecules) journals
- ❖ 2020-present: Member of The Biophysical Society, USA
- ❖ 2019-2020: Member of Royal Society of Chemistry