
SHIRSENDU GHOSH

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***Personal Details:***

Date of Birth: 1st May, 1988; Sex: Male; Nationality: Indian

Education/Research:

Research Associate	2021-	Institute: Department of Chemistry and Chemical Biology, Cornell University , USA Group Leader: Professor Barbara Baird
Postdoctoral Fellow	2016- 2021	Institute: Department of Chemical and Biological Physics, Weizmann Institute of Science , Israel Supervisor: Professor Gilad Haran Koshland Fellow/Senior Post-Doctoral Fellow
Ph. D. Fellow	2011- 2016	Institute: Department of Physical Chemistry, Indian Association for the Cultivation of Science Supervisor: Professor Kankan Bhattacharyya Thesis Title: Study of niosomes, protein and live cell using fluorescence correlation spectroscopy and microscopy CSIR-NET Fellow, (2010, All India Rank – 16)
M.Sc. (Chemistry)	2009-2011	Institute: Indian Institute of Technology, Kharagpur Supervisor: Professor Nilmoni Sarkar Project Title: Solvation dynamics and rotational relaxation study inside niosome, a nonionic innocuous poly (ethylene glycol)-based surfactant assembly: an excitation wavelength dependent experiment Division: First Class
B.Sc. (Chemistry Honors)	2006-2009	Institute: Jadavpur University Division: First Class

Awards and Honors:

- **DST Inspire Faculty Fellowship (2020)** from the Department of Science & Technology, India
- **Senior Postdoctoral Fellowship (2019)** from Weizmann Institute of Science.
- **Koshland Prize (2017)** from Koshland Foundation-Weizmann Institute of Science as an exceptionally outstanding Postdoctoral Fellows.
- **CSIR Junior Research Fellowship (JRF, 2011-2013)** and **CSIR Senior Research Fellowship (SRF, 2013-2016)** for doctoral studies.
- **National Eligibility Test (NET 2010, All India Rank - 16).**
- Qualified in Graduate Aptitude Test in Engineering (GATE 2011) in Chemistry.
- M.Sc. Fellowship from Indian Institute of Technology, Kharagpur (2009-2011).
- Qualified in Joint Admission test to M.Sc. (JAM 2009) in Chemistry.

Research Interest:

1. Cell membrane Topography
2. Allosteric signaling in proteins
3. Immunology and Cancer Biology
4. Membrane biophysics
5. Solvation Dynamics, Proton Transfer and FRET

Research Methodology:

1. Super-Resolution Microscopy:
 - a) Total Internal Reflection Fluorescence Microscopy (TIRFM)
 - b) direct Stochastic Optical Reconstruction Microscopy (d-STORM)
2. Single Molecule Tracking
3. Single Molecule Spectroscopy (SMS):
 - a) Fluorescence Correlation Spectroscopy (FCS)
 - b) Time-Resolved Confocal Microscopy
 - c) Single Molecule FRET (sm-FRET)
4. Femtosecond Up-conversion.
5. Time correlated single photon counting (TCSPC)

List of Publications:

Journal Articles:

1. "Control of protein activity by photoinduced spin polarized charge reorganization" **Shirsendu Ghosh**, Koyel Banerjee Ghosh, Dorit Levy, David Scheerer, Inbal Riven, Jieun Shin, Harry Gray, Ron Naaman*, Gilad Haran*, **PNAS, 2022**, 119, e2204735119-1-6. **Impact Factor- 12.78**
2. "CCR7 is clustered on tips of lymphocyte microvilli in proximity to a specialized subset of LFA-1" **Shirsendu Ghosh**, Sara Feigelson, Alessio Montresor, Eyal Shimoni, Francesco Roncato, Daniel Legler, Carlo Laudanna, Gilad Haran*, Ronen Alon*. **Biophysical Journal, 2021**, 120, 4002-4012; **Impact Factor- 4.033. Featured on the banner of the Weizmann Institute of**

Science homepage: <https://wis-wander.weizmann.ac.il/life-sciences/cell-brakes-some-assembly-required>

3. “Substrates modulate charge-reorganization allosteric effects in protein-protein association” **Shirsendu Ghosh**, Koyel Banerjee-Ghosh, Dorit Levy, Inbal Riven, Ron Naaman,* Gilad Haran* **The Journal of Physical Chemistry Letters** **2021**, *12*, 2805-2808. **Impact Factor- 6.888.**
4. “Long-range charge reorganization as an allosteric control signal in proteins” Koyel Banerjee-Ghosh, # **Shirsendu Ghosh**, # Hisham Mazal, Inbal Riven, Gilad Haran,* Ron Naaman,* (# **The first two authors contributed equally, *Corresponding authors**) **Journal of the American Chemical Society** **2020**, *142*, 20456–20462 **Impact Factor- 16.38.**
5. “ERM-Dependent Assembly of T-Cell Receptor Signaling and Co-stimulatory Molecules on Microvilli Prior to Activation” **Shirsendu Ghosh***, Vincenzo Di Bartolo, Liron Tubul, Eyal Shimoni, Elena Kartvelishvily, Tali Dadosh, Sara W. Feigelson, Ronen Alon, Andres Alcover and Gilad Haran* **Cell Reports** **2020**, *30*, 3434-3447. e6. (***Corresponding Author**) **Impact Factor- 9.995.**
6. “Preferential targeting of i-motifs and G-quadruplexes by small molecules” Manish Debnath, **Shirsendu Ghosh**, Ajay Chauhan, Rakesh Paul, Kankan Bhattacharyya, Jyotirmayee Dash* **Chemical Science** **2017**, *8*, 7448-7456 (EDGE Article). **Impact Factor- 9.969.**
7. “Fluorescence Dynamics in Endoplasmic Reticulum of a Live Cell: Time Resolved Confocal Microscopy” **Shirsendu Ghosh**, Somen Nandi, Catherine Ghosh and Kankan Bhattacharyya* **ChemPhysChem**, **2016**, *17*, 2818 –2823 (Front Cover Article and Cover Profile: **ChemPhysChem** **17** (18), 2775-2775). **Impact Factor- 3.52.**
8. “Fluorescence Probing of Fluctuating Microtubule using a Covalent Fluorescent Probe: Effect of Taxol” Catherine Ghosh, Debmalya Bhunia, **Shirsendu Ghosh**, Batakrishna Jana, Surajit Ghosh and Kankan Bhattacharyya* **Chemistry Select** **2016**, *1*, 1841–1847. **Impact Factor- 2.307.**
9. “Small Molecule Regulated Dynamic Structural Changes of Human G-Quadruplexes” Manish Debnath, **Shirsendu Ghosh**, Deepanjan Panda, Irene Bessi, Harald Schwalbe, Kankan Bhattacharyya, Jyotirmayee Dash* **Chemical Science** **2016**, *7*, 3279-3285 (EDGE Article). **Impact Factor- 9.969.**
10. "Single Molecule Spectroscopy: Exploring Heterogeneity in Chemical and Biological System" **Shirsendu Ghosh**, and Kankan Bhattacharyya* **The Chemical Record** **2016**, *16*, 601–613. **Impact Factor- 6.935.**
11. “Ionic Liquid Induced Dehydration and Domain Closure in Lysozyme” **Shirsendu Ghosh**, Sridip Parui, Biman Jana* and Kankan Bhattacharyya* **J. Chem. Phys.** **2015**, *143*, 125103-1-8. (**Most Read in Biological Molecules and Networks in 2016.**) **Impact Factor- 4.304.**
12. “Unfolding and Refolding of a Protein by Cholesterol and Cyclodextrin: a Single Molecule Study” **Shirsendu Ghosh**, Catherine Ghosh, Somen Nandi and Kankan Bhattacharyya* **Phys. Chem. Chem. Phys.** **2015**, *17*, 8017-8027. **Impact Factor- 3.945.**
13. “Solvation Dynamics and Intermittent Oscillation of Cell Membrane: Live Chinese Hamster Ovary Cell” **Shirsendu Ghosh**, Shyamtanu Chatteraj, and Kankan Bhattacharyya* **J. Phys. Chem. B** **2014**, *118*, 2949 – 2956. **Impact Factor- 3.466.**

14. "Structure and Dynamics of Lysozyme in DMSO–Water Binary Mixture: Fluorescence Correlation Spectroscopy" **Shirsendu Ghosh**, Shyamtanu Chatteraj, Rajdeep Chowdhury, and Kankan Bhattacharyya* *RSC Adv.* **2014**, *4*, 14378–14384. **Impact Factor- 3.245.**
15. "Effect of Room Temperature Ionic Liquids on Femtosecond Solvation Dynamics in a Triblock Copolymer (P123) Gel" Amit Kumar Mandal, **Shirsendu Ghosh**, Tridib Mondal, Atanu Kumar Das and Kankan Bhattacharyya* *Indian J. Chem. Sec A* **2013**, *52A*, 1047-1055. **Impact Factor- 0.412.**
16. "Heterogeneity in Binary Mixtures of Dimethyl Sulfoxide and Glycerol: Fluorescence Correlation Spectroscopy" Shyamtanu Chatteraj, Rajdeep Chowdhury, **Shirsendu Ghosh**, and Kankan Bhattacharyya* *J. Chem. Phys.* **2013**, *138*, 214507-1-8. **Impact Factor- 4.304**
17. "Dynamics in Cytoplasm, Nucleus, and Lipid Droplet of a Live CHO Cell: Time-Resolved Confocal Microscopy" **Shirsendu Ghosh**, Shyamtanu Chatteraj, Tridib Mondal, and Kankan Bhattacharyya* *Langmuir* **2013**, *29*, 7975–7982. **Impact Factor- 4.331.**
18. "Solvation Dynamics of Biological Water in a Single Live Cell under a Confocal Microscope" Dibyendu Kumar Sasmal, **Shirsendu Ghosh**, Atanu Kumar Das and Kankan Bhattacharyya* *Langmuir* **2013**, *29*, 2289–2298. **Impact Factor- 4.331.**
19. "Effect of NaCl on ESPT-Mediated FRET in a CTAC Micelle: A Femtosecond and FCS Study" Amit Kumar Mandal, **Shirsendu Ghosh**, Atanu Kumar Das, Tridib Mondal, and Kankan Bhattacharyya* *ChemPhysChem* **2013**, *14*, 788–796. **Impact Factor- 3.52.**
20. "Salt Effect on the Ultrafast Proton Transfer in Niosome" Tridib Mondal, **Shirsendu Ghosh**, Atanu Kumar Das, Amit Kumar Mandal and Kankan Bhattacharyya* *J. Phys. Chem. B* **2012**, *116*, 8105–8112. **Impact Factor- 3.466.**
21. "Solvation Dynamics under a Microscope: Single Giant Lipid Vesicle" Supratik Sen Mojumdar, **Shirsendu Ghosh**, Tridib Mondal and Kankan Bhattacharyya* *Langmuir* **2012**, *28*, 10230-10237. **Impact Factor- 4.331.**
22. "Diffusion of Organic Dyes in Niosome Immobilized on a Glass Surface using Fluorescence Correlation Spectroscopy." **Shirsendu Ghosh**, Amit Kumar Mandal, Atanu Kumar Das, Tridib Mondal and Kankan Bhattacharyya* *Phys. Chem. Chem. Phys.* **2012**, *14*, 9749–9757. **Impact Factor- 3.945.**
23. "Solvation Dynamics and Rotational Relaxation Study Inside Niosome, A Nonionic Innocuous Poly(ethylene Glycol)-Based Surfactant Assembly: An Excitation Wavelength Dependent Experiment" Chiranjib Ghatak, Vishal Govind Rao, **Shirsendu Ghosh**, Sarthak Mandal, and Nilmoni Sarkar* *J. Phys. Chem. B* **2011**, *115*, 12514–12520. **Impact Factor- 3.466.**

Conference Proceedings:

1. Super-Resolved Imaging of Early-Stage Dynamics in the Immune Response Yair Ben Sahel; Gilli Dardikman-Yoffe; Yonina C. Eldar; **Shirsendu Ghosh**; Gilad Haran 2021 IEEE International Conference on Image Processing (ICIP) DOI: 10.1109/ICIP42928.2021.9506695

SYMPHOSIUM /CONFERENCE ATTENDED:

Oral Presentation:

1. TIFR-Weizmann Interaction Meeting (TWIM-2019) at Tata Institute FR, Mumbai
2. The joint meeting of the Israeli Immunological Society (IIS) and the Israeli Society for Cancer Research-2019 at Tel-Aviv, Israel
3. Keck Biomembrane Retreat 2022 at Cornell University, USA

Poster Presentation:

1. International Symposium for Chemistry and Complexity, India, 2011
2. American Chemical Society (ACS) on Campus Meeting, India, 2012
3. National Fluorescence Workshop, India, 2012
4. Royal Society of Chemistry (RSC) - India Road Show, 2013
5. Trombay Symposium on Radiation & Photochemistry, India, 2014.
6. Dynamics of Complex Chemical and Biological Systems, India, (DCCBS14)
7. Symposium on Non-equilibrium Statistical Physics and Nonlinear Dynamics, India, 2014
8. Light in Chemistry, Materials and Biology, India, (LCMB – 2014)
9. Science Day Celebration, India, IACS-2014
10. Asian Academic Seminar, India, 2015
11. 8th Asian Photochemistry Conference, India, APC-2014.
12. Interdisciplinary approach to biological sciences, India, (IABS-2015)
13. Imaging the Immune System-II-2016, Weizmann Institute of Science, Israel
14. Seeing is Believing – Imaging the Molecular Processes of Life, 2019, EMBL, Heidelberg, Germany