

ACADEMIC PROFILE/ CV

Personal Details:

1. **Full name:** Dr. Subhas Samanta
2. **Designation:** Assistant Professor (Stage III)
3. **Date of birth:** 02.12.1979
4. **Date of Joining:** 22.02.2016
5. **Specialization:** Organic Chemistry
6. **Major Thrust Areas:** Organic Synthesis, Photochemistry, and Medicinal Chemistry (photopharmacology)



7. **Contact Information:** Rashbehari Siksha Prangan (known as *Rajabazar Science College*), 92, Acharya Prafulla Chandra Road, Kolkata – 700009
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Academic Credentials:

- Assistant Professor (Feb.2016-Till date): Calcutta University, Kolkata, India
- Postdoc (Apr.2013-Dec.2015): University of Pittsburgh, Pennsylvania, USA
- Postdoc (Apr.2013-Aug.2013): North Carolina State University, North Carolina, USA
- Postdoc (Oct.2009-Jan.2013): University of Toronto, Toronto, Canada
- Ph.D. (Aug.2003-Aug.2009): Indian Institute of Technology Kanpur (IITK), Kanpur, India

M.Sc. (2000-2002): Calcutta University (Presidency College, Calcutta, India)

Teaching:

1. Pericyclic Reactions (CHEM-G12)
2. Heterocyclic Chemistry (I-III, CHEM-G22 & CHEM-SO41)
3. Advanced Organic Synthesis (CHEM-SO43)
4. Photochemical-control of biological events (PhD level)

Research Interest:

Photoswitches and their potential applications in medicinal chemistry (photopharmacology), fluorescence sensing and imaging, and materials sciences (solar-thermal energy storage)

Extramural Research Grants Received:

- ❖ 2017-2019 UGC Start-Up Grant (10 lakhs)
- ❖ 2017-2018 UGC UPE II (4.5 lakhs)
- ❖ 2018-2021 DST-SERB (52 lakhs)

Research Experience:

- Apr, 2013 to Jan, 2016: Postdoctoral research fellow at the University of Pittsburgh, Pennsylvania, USA, Major Topic of Research: Genetical encoding of unnatural amino acids into proteins and microRNA-21 inhibitors for cancer therapeutic development

- Oct, 2009 to Jan, 2013: Postdoctoral research scholar at the University of Toronto, Toronto, Canada, Major Topic of Research: Photoswitchable small molecules to reversibly control peptide and protein structures
- Aug, 2003 to Aug, 2009: PhD. at the Indian Institute of Technology Kanpur, Kanpur, India, Supervisor: Prof. J. N. Moorthy, Major Topic of Research: Synthetic and mechanistic photochemistry and photochromism

Research Publications:

- 1) "Arylpyrrolylidene-indanones as readily synthesised photoswitches offering dual- and single-colour fluorescence toggling with nearly quantitative E/Z isomerisation under visible light" Satyajit Bera, Supriya Bhunia, Anirban Dolai, Sk Majid Box, Arpan Das, and Subhas Samanta*. **Chemical Science**, **2025**, 16, Advance article (<https://doi.org/10.1039/D5SC04551G>)
- 2) "Photoswitchable Stat3 inhibitors: design, synthesis and anticancer activity study on 2D and 3D breast cancer cell cultures" Bera, S., Bose, S., Paul, N., Bhunia, S., Das, A., Samanta, S*. **RSC Med. Chem.** **2025**, 16, 3582-3592 (<https://doi.org/10.1039/D5MD00490J>)
- 3) "Progress of Photoantibiotics in Overcoming Antibiotic Resistance" Bhunia, S., Box, Sk, M., Bera, S., Dolai, A., Samanta, S. **ChemMedChem** **2024**, 19, e202400613 (DOI: 10.1002/cmdc.202400613)
- 4) "Photoisomerization and light-controlled antibacterial activity of fluoroquinolone-azoisoxazole hybrids" Dolai, A., Bhunia, S., Jana, S. K., Bera, S., Mandal, S., Samanta, S. **ChemBioChem** **2024**, 25, e202300851 (DOI: 10.1002/cbic.202300851)
- 5) "Visible-Light-Sensitive Photoliquefiable Arylazoisoxazoles for the Solar Energy Conversion, Storage and Controlled-Release of Heat at Room Temperature or Lower Temperatures" Dolai, A., Bhunia, S., Manna, K., Bera, S., Box, Sk M., Bhattacharya, K., Saha, R., Sarkar, S., Samanta, S. **CheSusChem** **2024**, 17, e202301700 (DOI: 10.1002/cssc.202301700).
- 6) "Direct growth control of antibiotic-resistant bacteria using visible-light-responsive novel photoswitchable antibiotics" Bhunia, S., Jana, S. K., Sarkar, S., Das, A., Mandal, S., Samanta, S. **Chem.-Eur. J.** **2024**, 30, e202303685. (<https://doi.org/10.1002/chem.202303685>).
- 7) "Photoswitchable Antibiotic Hybrids: Spacer Length-Dependent Photochemical Control of Antibacterial Activity" Bhunia S., Das, A., Jana, S. K., Mandal, S., Samanta, S. **Bioconjugate Chem.** **2024**, 35, 1, 92–98. (<https://doi.org/10.1021/acs.bioconjchem.3c00488>)
- 8) "Photoisomerization of 2-Arylazoimidazoles under Visible Light: Identifying a Predictive Tool to Anticipate and Tune Likely Photoswitching Performance and Cis Half-Life" Dolai, A., Box, Sk., M., Bhunia, S., Bera, S., Das, A., Samanta, S. **J. Org. Chem.** **2023**, 88, 13, 8236–8247. (<https://doi.org/10.1021/acs.joc.3c00211>)
- 9) "Genetically Encoded Aminocoumarin Lysine for Optical Control of Protein-Nucleotide Interactions in Zebrafish Embryos" Brown, W., Wesalo, J., Samanta, S., Luo, J., Caldwell, E. S., Tsang, M., Deiters, A. **ACS Chem. Biol.** **2023**, 18, 6, 1305–1314.
- 10) "Synthesis, anti-cancer activity and molecular docking studies of new nicotinamide containing EP4 antagonists" Md. Akram Ali; Rajib Chakraborty; Susanta Kumar Mondal; Supriya Bhunia; Sabyasachi Chakraborty; Subhas Samanta; Sonali Rudra **J. Mol. Struct.** **2022**, 1260, 132730.
- 11) "Near-Complete Bidirectional Photoisomerization of para-Dialkylamino-Substituted Arylazopyrazoles under Violet and Green or Red Lights" Bhunia, S., Dolai, A., Bera, S., Samanta, S. **J. Org. Chem.** **2022**, 87, 6, 4449–4454. (DOI: 10.1021/acs.joc.1c02898) IF: 4.335
- 12) "Robust bi-directional photoswitching of thiomethyl substituted arylazopyrazoles under visible light"- Bhunia, A.; Dolai, A; **Samanta, S***. **Chem. Commun.** **2020**, 56, 10247-10250.
- 13) "Reversible and Tunable Photoswitching of Protein Function through Genetic Encoding of

- Azobenzene Amino Acids in Mammalian Cells"- Luo, J.; **Samanta, S.**; Convertino, M.; Dokholyan, N. V.; Deiters, A. **ChemBioChem** **2018**, *19*, 2178-2185.
- 14) "Genetic Code Expansion in Zebrafish Embryos and Its Application to Optical Control of Cell Signaling"- Liu, J.; Hemphill, J.; **Samanta, S.**; Tsang, M.; Deiters, A. **J. Am. Chem. Soc.** **2017**, *139*, 9100-9103.
 - 15) "Optical Control of DNA Helicase Function through Genetic Code Expansion" - Luo, J.; Kong, M.; Liu, L.; **Samanta, S.**; Houten, B. V.; Deiters, A. **ChemBioChem** **2017**, *18*, 466-469.
 - 16) "Red-Shifting Azobenzene Photoswitches for in Vivo Use"- Dong, M.; Babalhavaeji, A.; **Samanta, S.**; Beharry, A. A.; Woolley, G. A. **Acc. Chem. Res.** **2015**, *10*, 2662-70.
 - 17) "Conditional Control of Alternative Splicing Through Light-Triggered Splice-Switching Oligonucleotides"- Hemphill, J.; Liu, Q.; Uprety, R.; **Samanta, S.**; Tsang, M.; Juliano, R.; Deiters, A. **J. Am. Chem. Soc.** **2015**, *137*, 3656-3662.
 - 18) "Light-cleavable Q1 rapamycin dimer as an optical trigger for protein dimerization"- Brown, K., A.; Zou, Y.; Shirvanyants, D.; Zhang, J.; **Samanta, S.**; Mantravadi, P., K.; Dokholyan, N., V.; Deiters, A. D. **Chem. Commun.** **2015**, *51*, 5702-5705.
 - 19) "Genetic Encoding of Caged Cysteine and Caged Homocysteine in Bacterial and Mammalian Cells"- Uprety, R.; Luo, J.; Liu, J.; Naro, Y.; **Samanta, S.**; Deiters, A. **ChemBioChem** **2014**, *15*, 1793-1799.
 - 20) "Excited-state properties of fluorenones: influence of substituents, solvent and macrocyclic encapsulation"- Moorthy, J. N.; Ghosh, I.; Mukhopadhyay, A.; Koner, A. L.; **Samanta, S.**; Nau, W. M., **Phys. Chem. Chem. Phys.** **2014**, *16*, 16436-16445.
 - 21) "Photoswitching of ortho-Substituted Azonium Ions by Red Light in Whole Blood"- **Samanta, S.**; Babalhavaeji, A.; Dong, M., X.; Woolley, G., A. **Angew. Chem. Int. Ed.** **2013**, *52*, 14127-14130.
 - 22) "Robust visible light photoswitching with ortho-thiol substituted azobenzenes"- **Samanta, S.**; McCormick, T., M.; Schmidt, S., K.; Seferos, D., S.; Woolley, G., A. **Chem. Commun.** **2013**, *49*, 10314-10316.
 - 23) "Self-Assembly of Conformationally Rigid Dialcohols (Bis-Benzocyclobutenols): Supramolecular Cyclophanes and Arrays"- Bajpai, A.; Venkatakrishnan, P.; Mandal, S.; **Samanta, S.**; Venugopalan, P.; Moorthy, J., N. **Cryst. Growth Des.** **2013**, *13*, 4714-4720.
 - 24) "Photoswitching azo compounds in vivo with red light"- **Samanta, S.**; Beharry, A. A.; Sadovski, O.; McCormick, T. M.; Babalhavaeji, A.; Tropepe, V.; Woolley, G. A. **J. Am. Chem. Soc.** **2013**, *135*, 9777-9784. (**Highlighted in "Nature Chemical Biology 2013, 9, 469," as "Ready for red"**)
 - 25) "Helicity as a steric force: stabilization and helicity-dependent reversion of colored o-quinonoid intermediates of helical chromenes"- Moorthy, J. N.; Mandal, S.; Mukhopadhyay, A.; **Samanta, S.** **J Am. Chem. Soc.** **2013**, *135*, 6872-6884.
 - 26) "A bis-azobenzene cross-linker that isomerizes with visible light"- **Samanta, S.**; Qureshi, H. I.; Woolley, G. A. **Beilstein J. Org. Chem.** **2012**, *8*, 2184-2190.
 - 27) "Quantitative analysis of the effects of photoswitchable distance constraints on the structure of a globular protein"- Beharry, A. A.; Chen, T.; Sameer Al-Abdul-Wahid, M.; **Samanta, S.**; Davidov, K.; Sadovski, O.; Ali, A. M.; Chen, S. B.; Prosser, R. S.; Chan, H. S.; Woolley, G. A. **Biochemistry**, **2012**, *51* (32), 6421-6431.
 - 28) "Bidirectional Photocontrol of Peptide Conformation with a Bridged Azobenzene Derivative"- **Samanta, S.**; Qin, C.; Lough, A. J.; Woolley, G. A. **Angew. Chem. Int. Ed.** **2012**, *51*, 6452-6455. (**Chosen as a "Hot Paper" by the Editors for its importance**).
 - 29) "Reversible photo-control of peptide conformation with a rhodopsin-like photoswitch"- Blanco-Lomas, M[†].; **Samanta, S[†].**; Campos, P. J.; Woolley, G. A.; Sampedro, D. (**[†]Equal contribution**

to this work) **J. Am. Chem. Soc.** **2012**, *134*, 6960–6963.

- 30) “Bis-Azobenzene Crosslinkers for Photocontrol of Peptide Structure”- **Samanta, S.**; Woolley, G. A. **ChemBioChem** **2011**, *12*, 1712–1723.
- 31) “Influence of (2,3,4,5,6-Pentamethyl/phenyl)phenyl Scaffold: Stereoelectronic Control of the Persistence of o-Quinonoid Reactive Intermediates of Photochromic Chromenes”- Mandal, S.; Parida, K. N.; **Samanta, S.**; Moorthy, J. N. **J. Org. Chem.** **2011**, *76*, 7406-7414.
- 32) “Steady-state photochemistry (Pschorr cyclization) and nanosecond transient absorption spectroscopy of twisted 2-bromoaryl ketones”- Moorthy, J. N.; **Samanta, S.**; Koner, A. L.; Nau, W. M. **Pure and Appl. Chem.** **2011**, *83*, 841–860.
- 33) “A collection of caged compounds for probing roles of local translation in neurobiology”- Sadovski, O.; Jaikaran, A. S. I.; **Samanta, S.**; Fabian, M. R.; Dowling, R. J. O.; Sonenberg, N.; Woolley, G. A. **Bioorg. Med. Chem.** **2010**, *18*, 7746–7752.
- 34) “Modulation of Spectrokinetic Properties of o-Quinonoid Reactive Intermediates by Electronic Factors: Time-Resolved Laser Flash and Steady-State Photolysis Investigations of Photochromic 6- and 7-Arylchromenes”- Moorthy, J. N.; Koner, A. L.; **Samanta, S.**; Roy, A.; Nau, W. M. **Chem.-Eur. J.** **2009**, *15*, 4289-4300.
- 35) “Intramolecular O-H · O Hydrogen-Bond-Mediated Reversal In the Partitioning of Conformationally Restricted Triplet 1,4-Biradicals and Amplification of Diastereodifferentiation in Their Lifetimes”- Moorthy, J. N.; **Samanta, S.**; Koner, A. L.; Saha, S.; Nau, W. M. **J. Am. Chem. Soc.** **2008**, *130*, 13608-13617.
- 36) “Photoinduced C-Br Homolysis of 2-Bromobenzophenones and Pschorr Ring Closure of 2-Aroylaryl Radicals to Fluorenones”- Moorthy, J. N.; **Samanta, S.** **J. Org. Chem.** **2007**, *72*, 9786-9789.
- 37) “Photochromism of Arylchromenes: Remarkable modification of Absorption Properties and Lifetimes of o-Quinonoid Intermediates” - Moorthy, J. N.; Venkatakrishnan, P.; **Samanta, S.**; Kumar, D. K. **Org. Lett.** **2007**, *9*, 919-922.
- 38) “Novel Photochromism of Differently-linked Bis-benzopyrans”- Moorthy, J. N.; Venkatakrishnan, P.; **Samanta, S.** **Org. Biomol. Chem.** **2007**, *5*, 1354-1357.
- 39) “Photochemistry of Dicarbonyl-Substituted Benzenes: Influence of Steric and Electronic Factors in the Cyclization and Diels-Alder Trapping Reactions of Photoenols”- Moorthy, J. N.; **Samanta, S.** **ARKIVOC** (Gainesville, FL, U.S.) **2007**, *8*, 324-340.
- 40) “Diastereomer-Differentiating Photochemistry-Control of Reactivity of Triplet 1,4-Diradicals Derived from Norrish Type II Reactions”- Moorthy, J. N.; Singhal, N.; **Samanta, S.** **ISRAPS Bulletin.** **2006**, *18*, 45-51.
- 41) “Diastereomeric Discrimination in the Lifetimes of Norrish Type II Triplet 1,4-Biradicals and Stereocontrolled Partitioning of Their Reactivity (Yang Cyclization versus Type II Fragmentation)”- Moorthy, J. N.; Koner, A. L.; **Samanta, S.**; Singhal, N.; Nau, W. M.; Weiss, R. G. **Chem.-Eur. J.** **2006**, *12*, 8744-8749.
- 42) “β- Phenyl Quenching of Triplet Excited Ketones: How Critical is the Geometry for Deactivation?” - **Samanta S.**; Mishra, B. K.; Pace, T. C. S.; Sathyamurthy, N.; Bohne, C.; Moorthy, J. N. **J. Org. Chem.** **2006**, *71*, 4453-4459.

No of Books/Book Chapters: Nil

Patents (if any): Nil

List of Honours/Awards:

- Received senior research fellowship (SRF) of CSIR, INDIA, 2005-2008.
- Qualified National Eligibility Test (NET) (among top 20% awardees) in Chemical Science
- Received Junior Research Fellowship (JRF) of CSIR, INDIA, 2003-2005.
- Qualified all INDIA Graduate Aptitude Test for Engineering (GATE) with 99.05 percentile
- (all India rank 28) in Chemical Science, 2003
- Received “Cunningham Memorial Prize, Priyadarajan Ray Memorial Prize and Sir Upendra Nath Brahmachari Memorial Prize”, 2002 for securing highest marks in M. Sc. Chemistry Part II
- Received “Sandip Shome Memorial Prize”, 2001 for obtaining highest marks in M. Sc. Chemistry Part I

Membership in scientific bodies: Nil

Editor/or Editorial Board Member/Reviewer: Served as reviewers of RSC, ACS & ELSEVIER journals (<https://publons.com/dashboard/records/review/>)

Lecture Presentations:

- 94th Canadian Chemistry Conference and Exhibition, June 5-9, 2011, Montréal, Quebec, Canada; talk title: “Bis-azobenzenes for photo-controlling structures and functions of peptides and proteins” – Samanta, S.