

Curriculum Vitae of Dr. SAMIT GUHA



Address

Assistant Professor, Department of Chemistry, University of Gour Banga, Malda, India

E-mail: samitfsu@gmail.com

Mobile: +919163750994

Personal Information

A. Date of birth: 10th January 1981 B. Sex: Male C. Nationality: Indian

D. Permanent address: 42 Harish Neogi Road, Kolkata-67, India.

E. Academic Qualifications/Awards/Recognition/Honors

Assistant Professor	02/2016-continuing	Department of Chemistry, University of Gour Banga, Malda, India
Senior Research Scientist	06/2015-01/2016	TCG Lifesciences Private Limited, Kolkata, India
Postdoctoral Researcher	2014-2015	Department of Chemistry & Biochemistry, University of Notre Dame, Notre Dame, Indiana, USA, Prof. Bradley D Smith
Project Title:	Tumor-Activated Near-Infrared Molecular Probes in Membrane for Photothermal Cancer Theranostics	
Postdoctoral Researcher	2011–2013	Alexander von Humboldt Fellow, Department of Organic & Biomolecular Chemistry, University of Göttingen, Göttingen, Germany, Prof. Ulf Diederichsen
Project Title:	Light Triggered Mechanistic Investigation of Membrane Fusion through a Model Caged SNARE Protein	
Postdoctoral Researcher	2010–2011	Department of Chemistry & Biochemistry, Florida State University (FSU), USA, Prof. Sourav Saha
Project Title:	Molecular Recognition and Sensing	
Research Associate (I)	1/11/2009–31/12/2009	Department of Biological Chemistry, IACS, Jadavpur, Kolkata, India, Prof. Arindam Banerjee
Ph.D.	1/11/2004–31/10/2009	Department of Biological Chemistry, IACS, Jadavpur, Kolkata, India, Prof. Arindam Banerjee
Thesis Title:	Construction of Nanomaterials Using Self-Assembling Peptide-Based Molecules	
Ph.D. Supervisor:	Prof. Arindam Banerjee, Department of Biological Chemistry, IACS, Jadavpur, Kolkata 700032, India.	
Innovator Award	2014, Florida State University, USA, for US Patent.	
AvH Fellowship	2011-2013	
Senior Research Fellowship	1/11/2006–31/10/2009, CSIR-NET, New Delhi, India.	
Junior Research Fellowship	1/11/2004–31/10/2006 CSIR-NET, New Delhi, India.	
National Scholarship	2004	Calcutta University for B.Sc.
M.Sc. (Organic Chemistry)	2002–2004	Calcutta University I st class 5 th
B.Sc. (Chemistry)	1999–2002	Calcutta University I st class

F. Number of US Patent Issued: 1 **G. Number of Published Papers:** 22
H. Number of First Author Papers: 18 **I. Total Citations:** 650 and **h factor:** 12
J. Total Impact Factor: 139.62 **K. Average Impact Factor (I.F.):** 6.35

US Patent Issued

Colorimetric and Fluorimetric Fluoride Sensing. Sourav Saha, **Samit Guha**, U.S. Patent No US8541240 B2. Issued date: Sep. 24, **2013**. FSU Office of Commercialization. Tallahassee, FL.

LIST OF PUBLICATIONS IN INTERNATIONAL JOURNALS (I.F.: Journal Impact Factor 2015):

Postdoctoral Work

22. Croconaine Rotaxane for Acid Activated Photothermal Heating and Ratiometric Photoacoustic Imaging of Acidic pH.

Samit Guha, Gillian Karen Shaw, Trevor M. Mitcham, Richard R. Bouchard, Bradley D. Smith*, *Chem. Commun.* **2016**, 52, 120–123 [**I.F. = 6.57**].

21. Role of the Transmembrane Domain in SNARE Protein Mediated Membrane Fusion: Peptide Nucleic Acid/Peptide Model Systems.

Jan-Dirk Wehland, Antonina S. Lygina, Pawan Kumar, **Samit Guha**, Barbara E. Hubrich, Reinhard Jahn, Ulf Diederichsen* *Mol. Biosyst.* **2016**, 12, 2770–2776 [**I.F. = 2.83**].

20. Clean Photothermal Heating and Controlled Release From Near Infrared Dye Doped Nanoparticles Without Oxygen Photosensitization.

Samit Guha, Scott K. Shaw, Graeme T. Spence, Felicia M. Roland, Bradley D Smith*, *Langmuir* **2015**, 31, 7826–7834 [**I.F. = 3.99**].

19. SNARE Protein Analog-Mediated Membrane Fusion.

Pawan Kumar, **Samit Guha**, Ulf Diederichsen*, *J. Pept. Sci.* **2015**, 21, 621–629 [**I.F. = 1.95**].

18. Spatial Modulation Spectroscopy for Imaging and Quantitative Analysis of Single Dye-Doped Organic Nanoparticles Inside Cells.

Mary Sajini Devadas, Tuphan Devkota, **Samit Guha**, Scott K. Shaw, Bradley D Smith, Gregory V. Hartland*, *Nanoscale* **2015**, 7, 9779–9785 [**I.F. = 7.76**].

17. Nucleobase Caged Peptide Nucleic Acids: PNA/PNA Duplex Destabilization and Light Triggered PNA/PNA Recognition.

Samit Guha, Julia Graf, Björn Göricke, Ulf Diederichsen*, *J. Pept. Sci.* **2013**, 19, 415–422 [**I.F. = 1.95**].

16. Tunable Electronic Interactions between Anions and Perylenediimide.

Flynt S. Goodson, Dillip K. Panda, Shuvasree Ray, Atanu Mitra, **Samit Guha**, Sourav Saha*, *Org. Biomol. Chem.* **2013**, 11, 4797–4803 [**I.F. = 3.56**].

15. Boundaries of Anion/Naphthalenediimide Interactions: From Anion- π Interactions to Anion-Induced Charge-Transfer and Electron-Transfer Phenomena.

Samit Guha, Flynt S. Goodson, Lucas J. Corson, Sourav Saha*, *J. Am. Chem. Soc.* **2012**, 134, 13679–13691 [**I.F. = 13.04**].

(JACS cover page & JACS Spotlights August 2012, Issue 33)

(Highlighted in ScienceDaily, FSU News)

14. Deciphering Anion- π -Acceptor Interactions and Detecting Fluoride Using a Naphthalenediimide-Based Pd(II) Coordination Polymer.

Samit Guha, Flynt S. Goodson, Ronald J. Clark, Sourav Saha*, *CrystEngComm* **2012**, 14, 1213–1215 [**I.F. = 3.85**].

(The top 10 most accessed papers from CrystEngComm online during January 2012)

13. Electronically Regulated Thermally and Light-Gated Electron Transfer from Anions to Naphthalenediimides.

Samit Guha, Flynt S. Goodson, Sovan Roy, Lucas J. Corson, Curtis A. Gravenmier, Sourav Saha*, *J. Am. Chem. Soc.* **2011**, 133, 15256–15259 [**I.F. = 13.04**].

12. Fluoride Ion Sensing by an Anion- π Interaction.

Samit Guha, Sourav Saha*, *J. Am. Chem. Soc.* **2010**, *132*, 17674–17677 [I.F. = **13.04**].

(The top 20 downloaded articles from *J. Am. Chem. Soc.* during January 2011)

(Highlighted in the *C&EN* (Dec 6, 2010), *JACS^β video abstract*, *ScienceDaily*, *Medical News TODAY*, *FSU News*, *Frost & Sullivan*, *R&D Magazine*, *The Engineer*, *FSU Radio*)

Ph.D. Work

11. Fluorescent Au@Ag Core–Shell Nanoparticles with Controlled Shell Thickness and Hg^{II} Sensing.

Samit Guha, Subhasish Roy, Arindam Banerjee*, *Langmuir* **2011**, *27*, 13198–13205 [I.F. = **3.99**].

(The top 20 most accessed papers from *Langmuir* online during November 2011)

10. Construction of Supramolecular Helices and Breaking the Helicity by Forming Supramolecular β -sheet structures Using Suitable Self-Assembling Pseudopeptide Building Blocks.

Samit Guha, Michael G. B. Drew, Arindam Banerjee*, *Cryst. Growth Des.* **2010**, *10*, 4716–4721 [I.F. = **4.43**].

9. Self-Assembled Robust Dipeptide Nanotubes and Fabrication of Dipeptide-Capped Gold Nanoparticles on the Surface of these Nanotubes.

Samit Guha, Arindam Banerjee*, *Adv. Funct. Mater.* **2009**, *19*, 1949–1961 [I.F. = **11.32**].

8. Size Tuning of Au Nanoparticles Formed by Electron Beam Irradiation of Au₂₅ Quantum Clusters Anchored Within and Outside of Dipeptide Nanotubes.

P. Ramasamy, ‡ **Samit Guha**, ‡ E. S. Shibu, T. S. Sreeprasad, Soumabha Bag, Arindam Banerjee*, Thalappil Pradeep*, *J. Mater. Chem.* **2009**, *19*, 8456–8462 [I.F. = **6.63**].

‡ **These two authors have contributed equally.**

7. Water Soluble Synthetic Dipeptide-Based Biodegradable Nanoporous Materials.

Samit Guha, Tushar Chakraborty, Arindam Banerjee*, *Green Chem.* **2009**, *11*, 1139–1145 [I.F. = **8.51**].

6. Solvent-Induced Dynamic Single-Crystal-to-Single-Crystal Transformation of a Synthetic Peptide-Based Cyclic Compound.

Samit Guha, Michael G. B. Drew, Arindam Banerjee*, *CrystEngComm* **2009**, *11*, 756–762 [I.F. = **3.85**].

(The top 10 most accessed papers from *CrystEngComm* online during May 2009)

5. Macroporous Materials from Self-Assembling Synthetic Cyclic Peptide-Based Compounds and Deposition of Dipeptide-Capped Gold Nanoparticles on the Surfaces.

Samit Guha, Arindam Banerjee*, *Macromol. Chem. Phys.* **2009**, *210*, 1422–1432 [I.F. = **2.50**].

4. Construction of Helical Nanofibers from Self-Assembling Pseudopeptide Building Blocks: Modulating the Handedness and Breaking the Helicity.

Samit Guha, Michael G. B. Drew, Arindam Banerjee*, *Small* **2008**, *4*, 1993–2005 [I.F. = **8.32**].

3. Dipeptide Nanotubes, with N-Terminally Located ω -Amino Acid Residues, That are Stable Proteolytically, Thermally, and Over a Wide Range of pH.

Samit Guha, Michael G. B. Drew, Arindam Banerjee*, *Chem. Mater.* **2008**, *20*, 2282–2290 [I.F. = **9.41**].

2. A New Molecular Scaffold for the Formation of Supramolecular Peptide Double Helices: The Crystallographic Insight.

Samit Guha, Michael G. B. Drew, Arindam Banerjee*, *Org. Lett.* **2007**, *9*, 1347–1350 [I.F. = **6.73**].

1. Formation of a One-Dimensional Helical Alignment of Water Molecules Within a Water-Mediated Supramolecular Helix Using Molecular Self-Assembly of a Water-Soluble Short Pseudopeptide.

Samit Guha, Michael G. B. Drew, Arindam Banerjee*, *Tetrahedron Lett.* **2006**, *47*, 7951–7955 [I.F. = **2.35**].

Manuscript under Preparation

1. Light Triggered Membrane Fusion Using Artificial Caged SNAREs: Fine Tuning and Complete Inhibition of Membrane Fusion to Two Stage Zippering.

Samit Guha, Julia Graf, Ulf Diederichsen*, **2017**, Manuscript under preparation.

My Name in the Acknowledgement Section: Nirup B. Mandal et al *Green Chem*, **2009**, *11*, 931–934.

Reviewer for Refereed Journals

1. *Environ. Sci. Technol.* **2012**, *46*, 404–409.
2. Manuscript ID: bc-2014-00373w, *Bioconjugate Chem.* **2014**.
3. Manuscript ID: bc-2014-005069, *Bioconjugate Chem.* **2014**.
4. *Organometallics* **2015**, *34*, 918–925.

Judge for a Poster Session

HARPER CANCER RESEARCH INSTITUTE, Fourth Annual Research Day, Notre Dame, USA, 14th April **2015**, Undergraduate poster.

Presentations in National/International Symposium/Conferences and Book of Abstract Published

16. Invited Speaker “Molecular Machinery of Membrane Fusion”.

Samit Guha* One-Day National Seminar on Recent Advances in Chemistry, Department of Chemistry, Gour Mahavidyalaya, Malda, India, 12th November **2016**.

15. Invited Speaker “Molecular Design of Anion and pH Sensors”.

Samit Guha* One-Day National Seminar on Recent Developments in Chemistry, Department of Chemistry, Kaliyaganj College, Uttar Dinajpur, India, 20th September **2016**.

14. Invited Speaker “Molecular Recognition and Sensing”.

Samit Guha* National Symposium in Chemical Science, Department of Chemistry, University of Gour Banga, Malda, India, 12th March **2016**.

13. Poster presentation “Dye-Doped Lipid-Polymer Hybrid for Tumor Imaging and Photothermal Therapy”.

Samit Guha, Felicia M. Roland, and Bradley D. Smith*, HARPER CANCER RESEARCH INSTITUTE, Fourth Annual Research Day, Notre Dame, USA, 14th April **2015**.

12. Oral presentation “Light Triggered Membrane Fusion Using Artificial Caged SNAREs”.

Samit Guha, Ulf Diederichsen*, Göttinger Chemie-Forum **2013**, Göttingen, Germany, 5th June **2013**.

11. Poster presentation “Boundaries of Anion/ π -Acid Interactions: From Anion- π and Charge Transfer Interactions to Thermal and Photoinduced Electron Transfer Events”.

Sourav Saha, **Samit Guha**, F. S. Goodson, D. K. Panda, 8th International Symposium on Macrocyclic & Supramolecular Chemistry (ISMCS-8), 7-11th July **2013**, University of Maryland, Arlington, Virginia, USA.

10. Poster presentation “Construction of novel hybrid biooligomers as artificial SNAREs to dissect the mechanism of SNAREs in membrane docking and fusion”.

Prof. Ulf Diederichsen/Prof. Reinhard Jahn, **Samit Guha**, SFB 803, project B05, 9th October **2012**, Georg-August-Universität Göttingen, Germany.

9. Poster presentation “Deciphering anion- π interactions: From manifestation to application”.

Sourav Saha, **Samit Guha**, 6th International Symposium on Macrocyclic & Supramolecular Chemistry (ISMCS), 3-7th July **2011**, University of Sussex, Brighton, UK.

8. Poster presentation “Fluoride Ion Sensing through an Anion- π Interaction”.

Samit Guha, Sourav Saha, Council on Research and Creativity, Florida State University, USA, 28th April **2011**.

7. Optical sensing of fluoride ion through a reversible chromogenic anion- π interaction.

Sourav Saha, **Samit Guha**, Abstracts of Papers, 241st ACS National Meeting & Exposition, Anaheim, CA, United States, March 27-31, **2011** (2011), ORGN-617.

6. Oral presentation “COLORIMETRIC SENSING OF FLUORIDE ION THROUGH A CHROMOGENIC ANION- π INTERACTION”

Samit Guha, Florida Annual Meeting and Exposition (FAME), 87th Annual ACS Florida Section, 12-14th May 2011, Florida, USA.

5. Poster presentation “Electronically Regulated Thermally and Light-Gated Electron Transfer from Anions to Naphthalenediimides”.

Samit Guha, Flynt Goodson, Sourav Saha; Organized by Department of Chemistry & Biochemistry, Florida State University, USA, March 6 & April 7, 2011.

4. Poster presentation “Self-Assembled Molecular Tweezers for Ion-Pair Recognition and Binding”.

Samit Guha, Jacob Hunt, Ian Walton, Sourav Saha; Organized by Department of Chemistry & Biochemistry, Florida State University, USA, March 6 & April 7, 2010.

3. Poster presentation “Self-assembling peptide as novel smart nanomaterials”.

Jishu Naskar, Gautam Palui, **Samit Guha**, Arindam Banerjee; **International Conference on Frontiers of Functional Materials**; organized by Department of Chemistry, University of Calcutta from January 6–7, 2009.

2. Poster presentation “Self-Assembling Short Peptide and Pseudopeptide-Based Nanomaterials”.

Samit Guha, Arindam Banerjee; 10th CRSI national Symposium in Chemistry, organized by Indian Institute of Science, Bangalore, India, 2008.

1. Poster presentation “Self-assembling short peptide based Nanotubes”.

Samit Guha, Arindam Banerjee; 2nd Mid Year Symposium of Chemical Research Society of India (CRSI), organized by Indian Institute of Technology Guwahati, Guwahati 781039, Assam, India, 21st July 2007.

L. Organizing Committee/Member

1. **Assistant Secretary**: National Symposium in Chemical Science, Department of Chemistry, University of Gour Banga, Malda, India, 12th March 2016.

2. **BOS member in Chemistry**: PG level, University of Gour Banga, 2016-2017.

3. **BRS member**: University of Gour Banga, 2016-2017.

4. **Member, CBCS committee**: University of Gour Banga, 2016-2017.

M. Research and Instrumental skills

Organic synthesis, solution and solid-phase peptide synthesis, microwave assisted solid-phase peptide synthesis, solid-phase peptide nucleic acid (PNA) synthesis, caged PNA synthesis, transmembrane peptide synthesis, SNARE protein synthesis, caged artificial SNARE protein synthesis, molecular recognition and sensing, preparation of large unilamellar vesicles (LUVs), protein reconstitution into LUVs, membrane fusion, total lipid mixing assay, inner leaflet lipid-mixing, content mixing assay, FRET, NIR molecular probes, rotaxanes, photothermal cancer theranostics, lipid-polymer hybrid, drug delivery, supramolecular chemistry, nanoscience & nanotechnology, organic-inorganic hybrid nanomaterial, solid phase peptide synthesizer, automated microwave assisted solid phase peptide synthesizer, HPLC, LCMS, mass spectrometry (ESI and MALDI), NMR, FT-IR, circular dichroism (CD), UV/Vis and Fluorescence spectroscopy, UV melting, dynamic light scattering (DLS), FE-SEM, TEM, AFM, fluorescence microscope, X-ray powder diffraction (XRPD), isothermal titration calorimetry (ITC), cyclic voltametry (CV), spectroelectrochemistry, photothermal heat generation using NIR LASER etc.

N. Research Results

I have extensive research experience in synthetic organic chemistry including linear peptides, cyclic peptides, transmembrane peptides, peptide/PNA hybrid, SNARE protein, microwave assisted solid-phase peptide synthesis, manual solid-phase peptide synthesis, solid-phase PNA and caged photolabile PNA synthesis, foldamer synthesis etc. I have also experienced in supramolecular chemistry and bionanotechnology, and a range of spectroscopy and microscopy

techniques. I was in-charge of the peptide section during my industrial work at TCGLS. I have installed automated microwave assisted solid phase peptide synthesizer (Liberty Peptide Synthesizer, CEM). My 3rd postdoctoral research was based on **tumor-activated near-infrared (NIR) rotaxanes in lipid membrane and lipid-polymer hybrid for photothermal therapy with imaging diagnostics**. The probes contain a chromophore that absorbs **800 nm NIR light** and creates a site of **nanoscale heating** that has been identified using high resolution, whole body imaging. Once a tumor has been located, a focused laser beam is employed to achieve localized hyperthermia and tumor ablation. The smart pH switchable rotaxanes has been used for pH controlled photothermal heat generation and drug release. My 2nd postdoctoral research was based on **light triggered mechanistic investigation of membrane fusion using a model caged SNARE protein**. I have discovered nucleobase caged PNAs for PNA/PNA duplex destabilization and light triggered PNA/PNA recognition. I have designed and construct artificial caged SNAREs to arrest intermediate stages in membrane fusion such as docking and hemifusion. Caging with a photolabile protecting groups in artificial caged SNAREs has been used for fine tuning and complete inhibition of membrane fusion to stepwise recognition/ two-stage zippering. The research of my 1st postdoctoral work was based on **electron transfer, charge transfer, photoinduced electron transfer, anion- π interaction, aromatic electron donor-acceptor conformers, foldamer, colorimetric and fluorimetric anion recognition and sensing**. I have synthesized a number of linear and cyclic peptides and pseudopeptides in my Ph.D. I have characterized the morphology of the self-assembled peptide nanomaterials using optical, fluorescence and confocal microscope, FE-SEM, TEM, AFM and Raman imaging, and discovered that some of these self-assembled peptide materials form **double turn molecular conformation, supramolecular helix, supramolecular helix inside a supramolecular helix, supramolecular double helix, mirror image supramolecular helix, helical nanofibers, mirror image helical nanofibers, nanotubes, fluorescent nanotubes, porous materials**. In addition, I have discovered **in situ formation and stabilization of metal nanoparticles (Au) and Au-Ag core-shell nanoparticles** using peptides. I have constructed **organic/inorganic nanoparticle based hybrid nanomaterial** and **fabricated dipeptide capped gold nanoparticles** on the surfaces of nanotubes and helical nanofibers. I have also discovered uniform deposition of glutathione (GSH) protected Au₂₅ quantum clusters inside and outside of nanotubes and the size of the coalesced Au clusters has been tuned using electron beam irradiation.

O. Teaching Experience

02/2016-continuing, Department of Chemistry, University of Gour Banga, Malda, India.

Through teaching and research, I would like to inspire the next generation of scientists to be imaginative, creative and innovative in their rigorous approach to scientific problems. I have a keen interest in teaching and project supervision and supervise a number of PhD, postgraduate and undergraduate students on a daily basis. I am teaching organic chemistry in SEM I 'Physical organic chemistry', 'Application of M.O. theory to organic chemistry', 'Aromaticity', 'Hammett equation', 'Pericyclic reaction'; SEM II 'Photochemistry', 'Bioorganic Chemistry'; SEM III 'Retrosynthesis', 'Reductions in Organic Chemistry'; SEM IV '2D NMR', 'Supramolecular Chemistry'.

P. Current Research Interests:

Solid Phase Synthesis: Peptide, Peptide Nucleic Acid (PNA), Transmembrane Peptide
Organic Synthesis, Near-Infrared Organic Dyes, Caged Photolabile Molecules, Rotaxane
Molecular Recognition and Sensing, FRET
Liposome, Membrane Fusion
Synthetic Ion Channel
Synthetic Molecular/Supramolecular Machines