

Dr. Pinaki Talukdar

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Employment:

- Indian Institute of Science Education and Research Pune. Associate Professor (July 2015 – Present).
- Indian Institute of Science Education and Research Pune. Assistant Professor (July 2009 – June 2015).
- Institute of Life Sciences, Hyderabad, India. Senior Research Scientist (Apr 2007 – June, 2009).
- Albany Molecular Research Inc. (AMRI) at Hyderabad Research Centre. Senior Research Scientist (Oct 2006 – Mar 2007).

Education and Research Experience:

- **Postdoctorate:** In Organic Chemistry. University of Illinois at Urbana-Champaign (Oct 2005 – Sep 2006). Research Topic: Carbohydrate Macrocyclic Based Synthetic Ion Channels with Controllable Anion Selectivity. Supervisor: Dr. Mary S. Gin.
- **Ph. D.:** In Organic Chemistry. Department of Organic Chemistry, University of Geneva, Switzerland (2001-2005). Thesis Title: Ligand-Gated Synthetic Ion Channels with Rigid-Rod π -Stack Architecture. Thesis Supervisor: Prof. Stefan Matile.
- **Master of Sciences:** In Chemical Sciences. Indian Institute of Sciences, Bangalore (2001). M.S. Thesis Title: Synthesis of Carbasugars and Other Structurally Related Motifs. Thesis Supervisor: Professor Goverdhan Mehta.
- **Bachelor of Science:** Honors in Chemistry. Presidency College, University of Calcutta (1998).

Research Areas:

The research interest of the group covers the area of synthesis, self-assembly and sensing. Current projects of the group are:

- **Synthesis:** Unnatural amino acids, synthetic methods involving ketenimine, molecules for the investigation of self-assembly and sensing.
- **Self-assembly:** Functional supramolecular nanostructures with particular aim of forming synthetic ion channels & transporters.
- **Fluorescence Sensing:** Development of fluorescent probes for detection of thiols (biothiols and arylthiols), reactive oxygen species (ROS), cations, anions, etc.

List of Publications:

Publications from IISER Pune:

1. *Trimodal control of ion-transport activity on cyclo-oligo-(1 \rightarrow 6)- β -D-glucosamine-based artificial ion-transport systems.* Roy, A.; Saha, T.; Gening, M. L.; Titov, D. V.; Gerbst, A. G.; Tsvetkov, Y. E.; Nifantiev, N. E.; * Talukdar, P. * *Chem. Eur. J.* **2015**, *21*, 17445-17452.
2. *Turn-on fluorescent probe designed for fluoride ion sensing in aqueous media.* Roy, A.; Saha, T.; Talukdar, P. * *Tetrahedron Lett.* **2015**, *56*, 4975-4979.

3. *Lysosome targeting fluorescence probe for imaging intracellular thiols.* Kand, D.; Saha, T.; Lahiri, M.; Talukdar, P.* *Org. Biomol. Chem.* **2015**, *13*, 8163-8168.
4. *Hydrogen sulfide mediated cascade reaction forming an iminocoumarin: Applications in fluorescent probe development and live-cell imaging.* Mishra, P. K.; Saha, T.; Talukdar, P.* *Org. Biomol. Chem.* **2015**, *13*, 7430-7436.
5. *Performance comparison of two cascade reaction models in fluorescence off-on detection of hydrogen sulfide.* Saha, T.; Kand, D.; Talukdar, P.* *RSC Adv.* **2015**, *5*, 1438-1446.
6. *Metal-organic framework based highly selective fluorescence turn-on probe for hydrogen sulphide.* Nagarkar, S. S.; Saha, T.; Desai, A. V.; Talukdar, P.* Ghosh, S. K.,* *Sci. Rep.* **2014**, DOI: 10.1038/srep07053.
7. *Structural imposition on off-on response of naphthalimide based probes for selective thiophenol sensing.* Kand, D.; Mandal, P. S.; Saha, T.; Talukdar, P.* *RSC Adv.* **2014**, *4*, 59579-59586.
8. *Stereoselective synthesis of (2S,3R)- α -hydroxy- β -amino acids (AHBAs): Valinoctin A, (2S,3R)-3-amino-2-hydroxydecanoic acid and a fluorescent-labeled (2S,3R)-AHBA.* Deshmukh, S. C.; Talukdar, P.* *J. Org. Chem.* **2014**, *79*, 11215-11225.
9. *Hopping-mediated anion transport through a mannitol-based rosette ion channel.* Saha, T.; Dasari, S.; Tewari, D.; Prathap, A.; Sureshan, K. M.; Bera, A. K.;* Mukherjee, A.;* Talukdar, P.* *J. Am. Chem. Soc.* **2014**, *136*, 14128-14135.
10. *Pink fluorescence emitting fluoride ion sensor: Investigation of the cascade sensing mechanism and bioimaging applications.* Roy, A.; Kand, D.; Saha, T.; Talukdar, P.* *RSC Adv.* **2014**, *4*, 33890-33896.
11. *In vitro sensing of Cu⁺ through a green fluorescence rise of pyranine.* Saha, T.; Sengupta, A.; Hazra P.; Talukdar, P.* *Photochem. Photobiol. Sci.* **2014**, *13*, 1427-1433.
12. *Cyclo-oligo-(1 \rightarrow 6)- β -D-glucosamine based artificial channels for tunable transmembrane ion transport.* Saha, T.; Roy, A.; Gening, M. L.; Titov, D. V.; Gerbst, A. G.; Tsvetkov, Y. E.; Nifantiev, N. E.; * Talukdar, P.* *Chem. Commun.* **2014**, *50*, 5514-5516.
13. *Cascade reactions based fluorescent probe for rapid and selective fluoride ion detection.* Roy, A.; Kand, D.; Saha, T.; Talukdar, P.* *Chem. Commun.* **2014**, *50*, 5510-5513.
14. *Off-on type fluorescent NBD-probe for selective sensing of cysteine and homocysteine over glutathione.* Kand, D.; Saha, T.; Talukdar, P.* *Sensor. Actuat. B-Chem.* **2014**, *196*, 440-449.
15. *Iminocoumarin based fluorophores: indispensable scaffolds for rapid, selective and sensitive detection of thiophenol.* Kand, D.; Mandal, P. S.; Datar, A.; Talukdar, P.* *Dyes Pigments.* **2014**, *106*, 25-31.
16. *Fluorescent Off-On NBD probe for fluoride sensing: Theoretical validation and experimental studies.* Roy, A.; Datar, A.; Kand, D.; Saha, T.; Talukdar, P.* *Org. Biomol. Chem.* **2014**, *12*, 2143-2149.
17. *BODIPY based "click on" fluorogenic dyes: Application in live cell imaging.* Chauhan, D. C.; Saha, T.; Lahiri, M.; Talukdar, P.* *Tetrahedron Lett.* **2014**, *55*, 244-247.
18. *A 1,3-amino group migration route to form acrylamidines.* Chauhan, D. P.; Varma, S. J.; Vijeta, A.; Banerjee, P.; Talukdar, P.* *Chem. Commun.* **2014**, *50*, 323-325.
19. *A colorimetric and fluorometric BODIPY probe for rapid, selective detection of H₂S and its application in live cell imaging.* Saha, T.; Kand, D.; Talukdar, P.* *Org. Biomol. Chem.* **2013**, *11*, 8166-8170.
20. *Linear and cyclic oligo- β -(1 \rightarrow 6)-D-glucosamines: Synthesis, conformations, and applications for design of a vaccine and oligodentate glycoconjugates.* Gening, M. L.; Tsvetkov, Y. E.; Titov, D. V.; Gerbst, A.

- G.; Yudina, O. N.; Grachev, A. A.; Shashkov, A. S.; Vidal, S.; Imberty, A.; Saha, T.; Kand, D.; Talukdar, P.; Pier, G. B.; Nifantiev, N. E.,* *Pure Appl. Chem.*, **2013**, *85*, 1879-1891.
21. *δ -Unsaturated- γ -amino acids: enantiodivergent synthesis and cell imaging studies.* Kand, D.; Chauhan, D. P.; Lahiri, M.; Talukdar, P.* *Chem. Commun.* **2013**, *49*, 3591-3593.
 22. *Chromenoquinoline-based thiol probes: A study on quencher position for controlling fluorescent off-on characteristics.* Kand, D.; Kalle, A. M.; Talukdar, P.* *Org. Biomol. Chem.* **2013**, *11*, 1691-1701.
 23. *Diastereoselective construction of syn- α -oxyamines via three-component α -oxyaldehyde-dibenzylamine-alkynes coupling reaction: Application in the synthesis of (+)- β -conhydrine and its analogues.* Deshmukh, S.; Roy, A.; Talukdar, P.* *Org. Biomol. Chem.* **2012**, *10*, 7536-7544.
 24. *BODIPY based colorimetric fluorescent probe for selective thiophenol detection: Theoretical and experimental studies.* Kand, D.; Mishra, P. K.; Saha, T.; Lahiri, M.; Talukdar, P.* *Analyst*, **2012**, *137*, 3921-3924.
 25. *Chromenoquinoline-based fluorescent off-on thiol probe for bioimaging.* Kand, D.; Kalle, A. M.; Varma, S. J.; Talukdar, P.* *Chem. Commun.* **2012**, *48*, 2722-2724.
 26. *Inhibition of SIRT1 by a small molecule induces apoptosis in breast cancer cells.* Kalle, A. M.;* Mallika, A.; Sachchidanand, Badiger, J.; Alinakhi, Talukdar, P., *Biochem. Biophys. Res. Commun.*, **2010**, *401*, 13-19.
 27. *Heat shock protein 90 as a drug target against protozoan infections: Biochemical characterization of Hsp90 from Plasmodium falciparum, Trypanosoma evansi and evaluation of its inhibitor as a candidate drug.* Pallavi, R.; Roy, N.; Nageshan, R. K.; Talukdar, P.; Pavithra, S. R.; Reddy, R.; Venketesh, S.; Goel, R. K.; Gupta, A. K.; Singh, R. K.; Yadav, S. C.; Tatu, U.,* *J. Biol. Chem.*, **2010**, *285*, 37964-37975.

Publications before joining IISER Pune:

1. *Conformationally restricted nucleocyclitols: A study into their conformational preferences and supramolecular architecture in the solid state.* Mehta, G.*; Talukdar, P.; Sen, S.; Venkatesh, P. *Eur. J. Org. Chem.*, **2009**, 4691-4698.
2. *Photoproduction of proton gradients with π -stacked fluorophore scaffolds in lipid bilayers.* Bhosale, S.; Sisson, A. L.; Talukdar, P.; Fürstenberg, A.; Banerji, N.; Vauthey, E.; Bollot, G.; Mareda, J.; Röger, C.; Würthner, F.; Sakai, N.; Matile, S.,* *Science*, **2006**, *313*, 84-86.
3. *Use of the exciton chirality method in the investigation of ligand-gated synthetic ion channels.* Sakai, N.; Talukdar, P.; Matile, S.* *Chirality*, **2006**, *18*, 91-94.
4. *Molecular recognition by synthetic multifunctional pores in practice: Are structural studies really helpful?* Baudry, Y.; Bollot, G.; Gorteau, V.; Litvinchuk, S.; Mareda, J.; Nishihara, M.; Pasini, D.; Perret, F.; Ronan, D.; Sakai, S.; Shah, M. R.; Som, A.; Sordé, N.; Talukdar, P.; Tran, D.-H.; Matile, S.* *Adv. Funct. Mat.*, **2006**, *16*, 169-179.
5. *Ligand-gated synthetic ion channels.* Talukdar, P.; Bollot, G.; Mareda, J.; Sakai, N.; Matile, S.* *Chem. Eur. J.*, **2005**, *11*, 6525-6532.
6. *Synthetic ion channels with rigid-rod π -stack architecture that open in response to charge-transfer complex formation.* Talukdar, P.; Bollot, G.; Mareda, J.; Sakai, N.; Matile, S.,* *J. Am. Chem. Soc.*, **2005**, *127*, 6528-6529.
7. *Outer surface modification of synthetic multifunctional pores.* Talukdar, P.; Sakai, N.; Sordé, N.; Gerard, D.; Cardona, V. M.; Matile, S.* *Bioorg. Med. Chem.*, **2004**, *12*, 1325-1336.

- Catalytic rigid-rod β -barrels with hydrazide cofactors to convert poor substrates as hydrazone conjugates.* Som, A.; Talukdar, P.; Baumeister, B.; Matile, S.* *Chimia*, **2003**, 57, 208-209.
- Bioorganic chemistry of rigid-rod molecules: Adventures with p-oligophenyls.* Baudry, Y.; Baumeister, B.; Das, G.; Gerard, D.; Matile, S.*; Sakai N.; Som, A.; Sordé, N.; Talukdar, P. *Chimia*, **2002**, 56, 667-671.
- Fluorometric detection of enzyme activity with synthetic supramolecular pores.* Das, G.; Talukdar, P.; Matile, S.* *Science*, **2002**, 298, 1600-1602.
- A norbornyl route to aminocyclohexitols: syntheses of diverse aminocarbasugars and confused aminocarbasugars.* Mehta, G.*; Lakshminath, S.; Talukdar, P. *Tetrahedron Lett.*, **2002**, 43, 335-338.
- A general norbornyl based synthetic approach to carbasugars and confused carbasugars.* Mehta, G.*; Talukdar, P.; Mohal, N. *Tetrahedron Lett.*, **2001**, 42, 7663-7666.

Book Chapter:

- Self-Assembled Artificial Transmembrane Ion Channels.* Gin, M. S.*; Schmidt, E.; Talukdar, P. In *Nanobiotechnology II: More Concepts and Applications*, Chad A. Mirkin, Christof M. Niemeyer Eds., Wiley-VCH Publishers, p. 3-15.

Conferences:

- Invited Lecture:** *Synthetic Ion Channels for Selective Anion Transport.* 10th Mid-Year CRSI Symposium in Chemistry at NIT Trichy. July 23–25, 2015.
- Oral Presentation:** *Unimolecular and Supramolecular Artificial Ion Channel Systems.* German Symposium in Supramolecular Chemistry (SupraChem 2015) at the Freie Universität Berlin, Germany. February 23–24, 2015.
- Invited Lecture:** *Synthetic Ion Channels for Selective Anion Transport.* Max Planck Institute of Colloids and Interfaces, Berlin, Germany. February 25, 2015.
- Oral Presentation:** *Synthetic Ion Channels for Selective Anion Transport.* 10th International Symposium on Macrocyclic and Supramolecular Chemistry (10th ISMSC-2015) in Strasbourg, France. June 28 – July 02, 2015.
- Oral Presentation:** *Anion Selective Artificial Channels Based on Smart Glycomotifs.* 18th European Carbohydrate Symposium (Eurocarb18) in Moscow, Russia. August 02–06, 2015.
- Oral Presentation:** *Unimolecular and Supramolecular Artificial Ion Channel Systems.* 13th Eurasia Conference in Chemical Sciences, IISc Bangalore, India, December 14-18, 2014.
- Invited Lecture:** *Unimolecular and Supramolecular Artificial Ion Channel Systems.* Frontiers in Chemical Sciences (FICS-2014), IIT Guwahati, India, December 4-6, 2014.
- Invited Lecture:** *Fluorescent Chemodosimeters for Selective Detection of Biorelevant Species.* 4th National Symposium on Functional Applications (NSFAC 2014) of Colorants. Department of Dyestuff Technology, Institute of Chemical Technology, Matunga. October 16-17, 2014.
- Oral Presentation:** *Development of Fluorescent Chemosensors for Detection of Thiol Species.* In 1st International Conference on Chemical Biology, ICT Hyderabad, India. Feb 06-08, 2014.
- Participation:** International Meeting on Chemical Biology, Indian Institute of Science Education and Research, Pune (May 26-28, 2013).
- Oral Presentation:** *Development of Inhibitors, Sensors and Ion Transporting Systems.* In 5th Baltic Meeting on Microbial Carbohydrates, Suzdal Russia. (Sep 02-06, 2012)

12. Participation: *Practical Applications of Modern Tools in Organic Synthesis and Purifications II.* Organized by RSC in IISER Pune (April 02 – April 04, 2012)

13. Participation: *Perspectives of Organic Synthesis.* University of Pune (March 24, 2012)

14. Organizing: *One Day Mini-Symposium on Mass Spectrometry in Chemistry and Biology.* 12th March, 2012 in IISER Pune.

Award:

- DAE Young Scientist Award (DAE-YSRA) during April 01, 2011 – March 31, 2014.

Membership and Affiliation:

- Life time membership of *Chemical Research Society of India.*