

*Poulomi Sengupta*

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**PROFESSIONAL PROFILE**

Currently, I am an assistant professor working in the department of Chemistry, Indrashil University, Kadi. I am a Ph. D. (topic Nanoparticle-mediated surface modification of hydrophobic polymeric films/scaffolds and their application towards tissue engineering) as a DST Women Scientist from [CSIR-National Chemical Laboratory](#), Pune. I have several years work experience in academics, as well as research. [Google scholar id: poulomisg](#)

**EDUCATION**

Degree	Institute	Subjects	Year
Ph.D.	<a href="#">CSIR National Chemical Laboratory</a> , Pune	Chemical Sciences	2019
MS	<a href="#">Washington University in St. Louis</a> , USA	Chemistry	2005
M.Sc.	<a href="#">IIT Kanpur</a>	Chemistry	2002
B. Sc.	<a href="#">Presidency College, Kolkata</a>	Chemistry	2000

**TEACHING EXPERIENCE**

Subjects taught in Indrashil University

- Chemical Thermodynamic (CH2103)
- Advanced Physical Chemistry II (CH5103)
- Chemical Kinetics (CH4104)
- Organic Qualitative Analysis (CH2107)
- Chemical Equilibrium and Chemical Kinetics (CH2203)
- Electrochemistry and Surface Chemistry (CH3103)
- Physical Chemistry I (CH4104)
- Physical Chemistry II (CH4203)
- Physical Chemistry Laboratory (CH4207)
- Inorganic and Physical Chemistry Laboratory (CH3207)
- Organometallic Chemistry and Catalysis (CH3202)

As a teaching Assistant: Organic Chemistry Laboratory: Spring 2004, 2005, 2006, Summer 2006;  
 General Chemistry I Laboratory Fall 2004; Advanced Organic Chemistry Fall 2007

**RESEARCH AREA**

One part of our research interest highlights the synthesis and application of metallic and organic nanomaterials followed by finding their applications in drug delivery. Metallic nanoparticles, due to their ease of synthesis, excellent optical properties and easy surface chemistry can be modified to a wide array of biocompatible units. These can unravel several mechanistic pathways pertaining to drug delivery and

propose solutions in the related field. Organic nanomaterials can easily incorporate insoluble drug molecules into their hydrophobic core, followed by delivering the payloads at the required sites. Facile surface chemistry is capable of aiding into targeting as well.

On the other hand, our lab's expertise is into the development of (unnatural) polymeric scaffolds for smooth functioning inside human body. Synthetic polymers (mostly hydrophobic polymers like HDPE) carry the advantages of optimal size, shape, porosity, interconnection, and the desired mechanical strength to stay permanently inside human body. Unfortunately, at the same time they are hydrophobic (dislikes water hence the cellular system) which restricts their facile integration with living tissue. To bridge this gap, we have made conscious effort in modifying the polymeric surface with gold nanoparticles. Gold nanoparticles, having a diverse surface chemistry impart a handle in changing the surface property of the scaffold. As a result, along with smooth functioning inside human body, the mechanism of cellular attachment (to a foreign body) can be well understood.

## PROJECTS

**Title:** Increasing the therapeutic index by changing the shape of nanostructures

**Amount:** rupees 24,11,520.00

**Role:** PI

**Agency:** SERB

**Duration:** 2 years

## THESIS SUPERVISED

As an assistant professor: Supervised 5 M.Sc. theses, 10 BSc theses.

As a DST women scientist: Supervised 3 M.Sc. thesis and 1 summer project student.

## PUBLICATIONS

1. *Unbiased Phenotype-Based Screen Identifies Therapeutic Agents Selective for Metastatic Prostate Cancer.* Ivy Chung, Kun Zhou, Courtney Barrows, Jacqueline Banyard, Arianne Wilson, Nathan Rummel, Atsushi Mizokami, Sudipta Basu, **Poulomi Sengupta**, Badaruddin Shaikh, Shiladitya Sengupta, Diane R. Bielenberg, and Bruce R. Zetter. *Frontiers in Oncology*. **2021** <https://doi.org/10.3389/fonc.2020.594141>
2. *Mechanical and microstructural studies in a polysaccharide-acrylate double network hydrogel.* Arun Torris, Sanoop Nair, K. P. Raji Mol, **Poulomi Sengupta**, Manohar Badiger. *Journal of the Mechanical Behavior of Biomedical Materials*, **2021**, 124, 104839.
3. *Development of a Smart Scaffold for Sequential Cancer Chemotherapy and Tissue Engineering.* **Poulomi Sengupta**, Vinay Agrawal, and Bhagavatula L. V. Prasad. *ACS Omega*, **2020**, 5, 20724.
4. *Surface Modification of Polymeric Scaffolds for Tissue Engineering Applications.* **Poulomi Sengupta**, Bhagavatula L. V. Prasad *Regen. Eng. Transl. Med.* **2018**, 4, 75.
5. *Surface modification of polymers for tissue engineering applications: Arginine acts as a sticky protein equivalent for viable cell accommodation.* **Poulomi Sengupta**, Bhagavatula L. V. Prasad. *ACS Omega*, **2018**, 3 (4), 4242-4251.
6. *Electrospinning of non-ionic cellulose ethers/polyvinyl alcohol nanofibers: Characterization and applications* Ashwini Wali, Yucheng Zhang, **Poulomi Sengupta**, Yuji Higaki, Atsushi Takahara, Manohar V. Badiger, *Carbohydrate Polymers*, **2018**, 181, 175-182.

7. *Modification of porous polyethylene scaffolds for cell attachment and proliferation.* **Poulomi Sengupta**, Sachin S. Surwase, Bhagabatula L. V. Prasad. *International Journal of Nanomedicine*, **2018** Mar 15;13:87-90.
8. *Impairing the Powerhouse in Colon Cancer Cells by Hydrazide-hydrazone based Small Molecule.* Sohan Patil, Meenu M. Kuman, Sandeep Palvai, **Poulomi Sengupta**, Sudipta Basu. *ACS Omega*, **2018**, 3, 1470-1481.
9. *Hyaluronic Acid Layered Chimeric Nanoparticle: Targeting MAPK-PI3K Signalling Hub in Colon Cancer Cells.* Sandeep Palvai, Meenu M. Kuman, **Poulomi Sengupta**, Sudipta Basu. *ACS Omega*, **2017**, 2, 7868- 7880.
10. *Cisplatin-induced self-assembly of graphene oxide sheets into spherical nanoparticles for damaging subcellular DNA.* Aditi Nandi, Abhik Mallick, Piyush More, **Poulomi Sengupta**, Nirmalya Ballav, Sudipta Basu. *Chemical Communications*, **2017**, 53, 1409-1412.
11. *Engineering and In Vitro Evaluation of Acid Labile Cholesterol Tethered MG132 Nanoparticle for Targeting Ubiquitin-Proteasome System in Cancer.* Chandramouli Ghosh, N. Gupta, Piyush More, **Poulomi Sengupta**, Abhik Mallick, Manas K. Santra, Sudipta Basu. *Chemistry Select*, **2016**, 1(16), 5099-5106.
12. *Anti-platelet agents augment cisplatin nanoparticle cytotoxicity by enhancing tumor vasculature permeability and drug delivery.* Ambarish Pandey, Sasmit Sarangi, Kenneth Chien, **Poulomi Sengupta**, Anne-Laure Papa, Sudipta Basu, Shiladitya Sengupta. *Nanotechnology*, **2014**, 25(44), 445101.
13. *Sequential application of a cytotoxic nanoparticle and a PI3K inhibitor enhances antitumor efficacy.* Ambarish Pandey, Ashish A. Kulkarni, Bhaskar Roy, Aaron Goldman, Sasit Sarangi, **Poulomi Sengupta**, Collin Phipps, Jawahar Koppam, Michael Oh, Sudipta Basu, Mohammad Kohandel, Shiladitya Sengupta. *Cancer Research*. **2014**, 74(3), 675-685.
14. *Supramolecular nanoparticles that target phosphoinositide-3-kinase overcome insulin resistance and exert pronounced antitumor efficacy.* Ashish A. Kulkarni, Bhaskar Roy, Poornima S. Rao, Gregory. A. Wyant, Ayaat Mahmoud, Madhumita Ramachandran, **Poulomi Sengupta**, Aaron Goldman, Venkata Ramana Kotamraju, Sudipta Basu, Raghunath A. Mashelkar, Erkki Ruoslahti, Daniela M. Dinulescu, Shiladitya Sengupta. *Cancer Research*, **2013**, 73(23), 6987-97.
15. *P2Y12 receptor inhibition augments cytotoxic effects of cisplatin in breast cancer.* Sasmit Sarangi, Ambarish Pandey, Anne-Laure Papa, **Poulomi Sengupta**, Jawahar Koppam, Ushashi Dadwal, Sudipta Basu, Shiladitya Sengupta. *Med Oncol*. **2013**, 30(2), 567.
16. *Mechanistic studies of Gemcitabine-loaded nanoplatforms in resistant pancreatic cancer cells* Anne-LaurePapa, Sudipta Basu, **Poulomi Sengupta**, Deboshri Banerjee, Aaron Goldman, Shiladitya Sengupta and Rania Harfouche. *BMC Cancer*, **2012**, 12, 419.
17. *A cholesterol-tethered platinum II-based supramolecular nanoparticle increases antitumor efficacy and reduces nephrotoxicity.* **Poulomi Sengupta**, Sudipta Basu, Shivani Soni, Ambarish Pandey, Michael Oh, Kenneth T. Chin, Abhimanyu S. Paraskar, Bhaskar Roy, Sasmit Sarangi, Yamicia O. Connors, Venkatesh Sabbiseti, Jawahar Koppam, Chitra Amarasiriwardena, Innocent Jayawardene, Nicola Lupoli, Daniela M. Dinulescu, Raghunath A. Mashelkar, Shiladitya Sengupta. *PNAS*, **2012**, 109 (28), 11294-11299.
18. *Cancer, Signal Transduction and Nanotechnology.* **Poulomi Sengupta**, Sudipta Basu, Shiladitya Sengupta. *Current Drug Delivery*, **2011**, 8, 254-260.

**POSTERS and ORAL PRESENTATIONS**

1. **Poulomi Sengupta**, Dr. Bhagavatula L. V. Prasad. Designing a two-in-one scaffold for drug release and tissue engineering ICONSAT Bengaluru 2018
2. **Poulomi Sengupta**, Dr. Bhagavatula L. V. Prasad. Designing a two-in-one scaffold for drug release and tissue engineering. Oral presentation at The Mumbai Pune Soft Matter Meet Jan 2018
3. **Poulomi Sengupta**, Dr. Bhagavatula L. V. Prasad. Designing a two-in-one scaffold for drug release and tissue engineering. Physical Chemistry Day CSIR National Chemical Laboratory (best poster award).
4. **Poulomi Sengupta**, Dr. Vinay Agrawal, Dr. Bhagavatula L. V. Prasad *Small molecule alteration controls cell adhesion property in polymeric scaffolds*. Presented at International Nanobiomed conference IIT Mumbai December 2015
5. **Poulomi Sengupta**, Karthika K. J., Sabareesh P., Bhagavatula L. V. Prasad. *Surface modified polymer films and scaffold with non-adherent characteristics for cell culture and tissue engineering applications*. Presented at Science Day, CSIR-National Chemical Laboratory February 2015
6. **Poulomi Sengupta**, Sachin S. Surwase, Dr. Vinay Agrawal, Dr. Bhagavatula L. V. Prasad. *Modification of porous polyethylene scaffolds for cell attachment and proliferation*. International Conference on Translational Nanomedicine, Institute of Life Sciences, Ahmedabad. December 2014
7. **Poulomi Sengupta**, Sachin Surwase, Bhagavatula L. V. Prasad. *Modification of porous polyethylene scaffolds for cell attachment and proliferation*. Presented at Science Day, CSIR-National Chemical Laboratory February 2014
8. Bhaskar Roy, **Poulomi Sengupta**, Daniela Dinulescu, Katherine Muto, Sudipta Basu, Shiladitya Sengupta. *Targeting Cancer by a Chimeric Nanoparticle formulation of Cisplatin and PI828, a PI3 kinase inhibitor*. Presented in AACR annual meeting April 2012
9. Bhaskar Roy, **Poulomi Sengupta**, Shivani Soni, Anne Laure PAPA, Jawahar Kopparam, Sasmit Sarangi, Ambarish Pandey, Sudipta Basu, Shiladitya Sengupta. *Enhancing Anti Cancer Activity of PI103, a dual PI3K/mTOR inhibitor by designing a self-assembled Nanoformulation*. Presented in AACR annual meeting April 2012
10. Ambarish Pandey, **Poulomi Sengupta**, Bhaskar Roy, Jawahar Kopparam, Sudipta Basu, Shiladitya Sengupta. *Targeting Cancer with Novel PI3K Inhibitor Containing Nanoparticles*. Presented in 102<sup>nd</sup> AACR meeting December 2010
11. **Poulomi Sengupta**, Shivani Soni, Sudipta Basu, Shiladitya Sengupta. *Targeting cancer by cisplatin containing nanovectors*. Presented in 101st AACR meeting April 2010
12. John Stephen, Taylor; **Poulomi Sengupta**. *Synthesis of novel PNA building blocks for strain-promoted "click" chemistry*. In the 234th ACS meeting in Boston August 2007

**PATENTS**

Nanoscale platinum compounds and methods of use thereof. Inventors: Shiladitya Sengupta, Abhimanyu Paraskar, Shivani Soni, Sudipta Basu, **Poulomi Sengupta**. US Application number US20160367682A1. Granted patent December 2020. Place USA

**BOOK CHAPTERS**

1. *Nanotechnology in hard tissue repair* - Poulomi Sengupta. "Nanotechnology in Medicine and Biology", edited by professors Huinan Liu, Tolou Shokuhfar, Sougata Ghosh. Publication house: Elsevier ISBN: 978-0-12-819469-0
2. *Nanotechnology and its use in tissue engineering* – a book chapter in the book titled *Diverse Applications of Nanotechnology in Biomedicine, Chemistry, and Engineering (Advances in Chemical and Materials Engineering)* IGI Global publications.
3. *Recent Innovations in Coronary Stents* – a book chapter in the book titled *Emerging Applications, Perspectives, and Discoveries in Cardiovascular Research (Advances in Medical Diagnosis, Treatment, and Care)* IGI Global publications.

### **HONORS and FELLOWSHIPS**

1. DST Women Scientist Fellowship January 2014 till July 2017
2. CSIR SRF Fellowship June 2013 (willingly discontinued)
3. Graduate Students Fellowship from Washington University in St. Louis A&S
4. Graduate Students Teaching Assistantship from dept. of Chemistry Washington University in St. Louis
5. Research Assistantship from the Department of Chemistry Washington University in St. Louis
6. Graduate Aptitude Test for Engineering (2002): 98.35 percentile (All India Rank 41)
7. National Eligibility Test (NET) 2002: UGC-JRF (Junior Research Fellowship)
8. Indian Academy of Sciences Fellowship: Summer 2001