

Dr. Rima Saha

(IN/PA-4630)



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10th September, 1993

Polymer Research Centre, Department of Chemical Sciences,
Indian Institute of Science Education and Research (IISER) Kolkata,
Mohanpur, Nadia, 741246, West Bengal, India.

EDUCATION:

Department of Polymer Science and Technology, University of Calcutta, Kolkata, India.

Ph. D. Dissertation: “Reversible Addition Fragmentation Chain Transfer (RAFT) Polymerization Mediated Amino Acid Based Polymer for Biomedical Application” May, 2023
Presidency University, Kolkata, West Bengal, India. 2014-2016
M. Sc., Chemistry (78.30%)
Barrackpore Rastraguru Surrendranath College, West Bengal State University, West Bengal, India 2011-2014
B.Sc., Chemistry (70.50%)
Rahara Bhabanath Institution for Girls, Kolkata, West Bengal, India 2011 and 2009
12th and (79.10 %) 10th grade (85%).

PERSONAL DETAILS:

Female, Unmarried, Indian, Date of Birth: September 10, 1993; Passport No.- RO443766

AWARDS AND ACHIEVEMENTS:

- ✓ Qualified Graduate Aptitude Test in Engineering (GATE) in Chemistry 2017
- ✓ Qualified for Lectureship for National Eligibility Test (NET) in Chemistry 2017
- ✓ Qualified for Indian Patent Agent Examination (IN/PA-4630) 2022

RESEARCH EXPERIENCE:

- Postdoctoral Fellow (IPDF); [Prof. Priyadarsi De’s Research Group] July 2023-Present
- Graduate Student, University of Calcutta, Kolkata, India. [Dr. Kishor Sarkar’s Research Group] July 2017-May 2023

“Reversible Addition Fragmentation Chain Transfer (RAFT) Polymerization Mediated Amino Acid Based Polymer For Biomedical Application”

Important findings:

- ✓ Amino-acid and fatty acid-based methacrylate monomer synthesis and their polymerization *via* RAFT method
- ✓ RAFT polymerization of photo responsive acrylate monomer and their application in cancer therapy
- ✓ Synthesis of di-block and tri-block copolymers and their application in gene and/or drug delivery

- M. Sc. Project, Presidency University, Kolkata, India. [Advisor: Dr. Koena Ghosh] 2016
“Regioselective synthesis of Ferrocenyl substituted Pyrazoline derivatives and study of their optical properties”
- Summer Research Fellow, JNCASR, Bangalore, India. [Prof. Subi Jacob George’s Research Group] May 2015-July 2015
“Synthesis of oligo(*para*)phenylenevinylene chromophore appended with dipicolyl ethylene di-amine receptor”

EMPLOYMENT:

Women Scientist-C December 2021-December 2022
Scheme on Intellectual Property Rights (WOS-C, KIRAN IPR) of TIFAC, Dept. of Science and Technology (DST), Govt. of India.

RESEARCH EXPERTISE:

Multi-step organic synthesis; RAFT polymerizations; synthesis of random, block, gradient copolymers; polymerization induced self-assembly; stimuli-responsive polymers; polymers with targeted molecular weight, pDNA isolation from bacterial cell, agarose gel electrophoresis, cell culture.

SUMMARY OF SKILLS:

- ✓ Spectroscopic Techniques: ¹H, ¹³C NMR, UV-Vis, FT-IR, Fluorescence.
- ✓ Thermal Analysis: Thermogravimetric Analysis (TGA), Differential scanning calorimetry (DSC)
- ✓ Size Exclusion Chromatography (SEC)
- ✓ Circular dichroism (CD), Dynamic Light Scattering (DLS)
- ✓ Dialysis, Lyophilization, Column chromatography
- ✓ Software used: Origin, ChemDraw Ultra, MestreNova, Graphpad Prism, ImageJ, Endnote.
- ✓ Microscopy: Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Confocal.
- ✓ pDNA isolation from E. coli (DH5 α), Gel electrophoresis
- ✓ MTT assay, Cellular uptake, Transfection
- ✓ Patentability searches using various patent databases like USPTO, INPASS, WIPO, EPO, Derwent Innovation.
- ✓ Patent novelty and inventive step search.
- ✓ Patent provisional (PS) and complete specification (CS) drafting.
- ✓ FER response preparation.
- ✓ Preparation of patent landscape reports and other technical documents.

PUBLICATIONS

Research articles

6. Patra, R; Halder, S; **Saha, R**; Jana, K; Sarkar, K. "Highly Efficient Photo Switchable Smart Polymeric Nano Vehicle for Gene and Anticancer Drug Delivery in Triple Negative Breast Cancer" (Manuscript submitted).
5. **Saha R.**, Halder S., Pradhan S S., Jana K., Sarkar K. "Superior gene transfection efficiency in triple negative breast cancer by RAFT mediated amino acid based cationic di-block copolymers". *J. Mater. Chem. B*, 11 (2023) 3617-3634. (IF: 7).
4. Chakraborty D., Musibb D.¹, **Saha R.**¹, Das A., Razaee M. K, Ramue V., Chongdara S., Sarkar K., Bhaumik A*, "Highly stable tetradentate phosphonate-based green fluorescent Cu-MOF for anticancer therapy and antibacterial activity" *Materials Today Chemistry*. 24 (2022) 100882 (IF: 7.3) (¹ Equal contribution).
3. Bej S., Das R., Mondal A., **Saha R.**, Sarkar K., Banerjee P., "Knoevenagel condensation triggered synthesis of dual-channel oxene based chemosensor: Discriminative spectrophotometric recognition of F⁻, CN⁻ and HSO₄⁻ with breast cancer cell imaging, real sample analysis and molecular keypad lock applications" *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*. 273 (2022) 120989 (IF: 4.4).
2. Sarkar P, Ghosh S, **Saha R**, Sarkar K., "RAFT polymerization mediated core-shell supramolecular assembly of PEGMA-co-stearic acid block co-polymer for efficient anticancer drug delivery" *RSC Advance*. 11 (2021) 16913-16923 (IF: 3.9).
1. **Saha R**, Bhayye S, Ghosh S, A Saha, Sarkar K*, "Supramolecular assembly of amino acid based cationic polymer for efficient gene transfection efficiency in triple negative breast cancer" *ACS Appl. Bio Mater*. 2, 12, (2019) 5349-5365 (IF:4.7).

Book Chapters

2. Patra R., Ghosal K., **Saha R.**, Sarkar P., Chattopadhyay S., Sarkar K. "Advances in the Development of Biodegradable Polymeric Materials for Biomedical Applications with Respect to Their Synthesis Procedures, Degradation Properties, Toxicity, Stability and Application"; Encyclopedia of Materials: Plastics and Polymers, *Elsevier*, 4, 2022, 567-592.
1. Ghosal K., Sarkar P., **Saha R.**, Ghosh S., Sarkar K. "Advances in Tissue Engineering and Regeneration" In: Li B., Moriarty T., Webster T., Xing M. (eds) *Racing for the Surface*, *Springer*, 2020, 577-646.

ACADEMIC CONTRIBUTIONS

Oral Presentations

- International Conference on Biomaterial-Based Therapeutic Engineering and Regenerative Medicine (BIOTERM), at *IIT Kanpur*, on November 28-December 1, 2019.
- International Conference on Nanotechnology: Ideas, Innovations & Initiatives; ICN:3I-2017, at *IIT Roorkee* on December 6-8, 2017.

Poster Presentations

- International Conference on BioMaterials, BioEngineering and BioTheranostic (BIOMET); at *Vellore Institute of Technology (VIT)* on July 24-28, 2018.
- Symposium on polymer Science (SPS-2019); at *IISER Kolkata*, on July 5-6, 2019.

REFERENCES

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Dr. Kishor Sarkar

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