Shailja Rai

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Career Objective

- Seeking a faculty position that allows me to apply my Ph.D. level expertise in Chemistry towards effective teaching, curriculum development, and student mentoring, while cultivating an engaging and concept-driven learning environment.

Education

- **Madan Mohan Malaviya University of Technology, Gorakhpur** 2024
  Doctor of Philosophy (Polymer Chemistry)
  Mentor: Prof. Poorn Prakash Pande **Thesis Title**: Synthesis, Characterisation and Application of Polymer-Enzyme Bioconjugates based on Various Vinylic Monomers
- **Lucknow University** 2019
  Master of Science (Chemistry)
  71.4
- **Delhi University** 2016
  Bachelor of Science (Chemistry Hons.)
  71.4

Experience

- Over a three-year tenure as a Research Scholar at Madan Mohan Malaviya University of Technology, Conducted inorganic chemistry laboratory courses for B. Tech. students across four semesters and for Master's students for two semester, while also mentoring eight M. Sc. students and one Ph. D. candidate in their research projects.

Teaching Interest

- Polymer Chemistry, Spectroscopy, water hardness, Organometallic, Atomic and Molecular Orbital Theory, Thermodynamics, Electrochemistry, Chemical Kinetics.

Research Interest

- Polymer Synthesis and Characterization
- Immobilization of Enzymes with polymer
- Biocompatible and Smart Polymer
- Nanomaterial Synthesis, Characterization and Properties

Research And Synthetic Skills

- Experience in polymer synthesis techniques (emulsion, solution polymerization), nanoparticle and nanocomposite synthesis.
- Proficient in schlenk line technique, grafting techniques, RAFT, ATRP and NMP techniques.
- Handled catalysis in organic reactions (acid/base, organometallic, enzymatic) and also purification techniques (chromatography, recrystallization, distillation).
- Experience in software such as Chemdraw, ChemSktech, Origin, Microsoft (Excel, Word, Power Point), Mercury, Matlab and MestReNova.
- Possess strong communication skills, a self-motivated and creative approach to problem-solving, and the ability to work effectively both independently and as a part of a team.
- Hands-on experience in operating UV-Vis., FT-IR, GPC, NMR, SEM and HPLC as well as solving complex problems related to structure elucidation.

Achievements & Awards

- Qualified for the award of Scholarship for Higher Education (SHE) under Innovation in Science Pursuit for Inspired Research (INSPIRE).
- Best oral presentation in Chemistry in 3rd International Conference on STAEBM-2023, at NIT Shrinagar, Jammu and Kashmir, India.
- Commendable Research Award for excellence in research, 2025 at MMMUT, Gorakhpur

Publications

- Enhancement of urease properties by introducing new interface based on pH responsive Polymer-Enzyme Bioconjugates via grafting through-RAFT polymerization technique, **Shailja Rai**, Poorn Prakash Pande, Krishna Kumar, *Material Chemistry and Physics*, 2023, doi: 10.1016/j.matchemphys.2023.128009 (Published).

- Ameliorating Enzyme Functionality with Temperature and pH Responsive Polymer Interface, **Shailja Rai**, Poorn Prakash Pande, Krishna Kumar, *Journal of Polymer Research*, 2024, doi: https://doi.org/10.1007/s10965-024-04227-6 (Published).

- Emergence of ADM-mediated bioconjugate to enhance longevity and catalytic efficiency of urease, **Shailja Rai**, Poorn Prakash Pande, Krishna Kumar, *International Journal of Biological Macromolecules*, 2024, doi: https://doi.org/10.1016/j.ijbiomac.2025.139629 (Published).

- Reinforcement of Urease through Encapsulation with β-Cyclodextrin-based Bioconjugates: A Comparative Analysis and Kinetic Assessment, **Shailja Rai**, Poorn Prakash Pande, Krishna Kumar, (Submitted).

Conferences And Workshops

- International Conclave on "Materials, Energy and Climate" (Enzymatic Activity Enhancement in Polymer-Enzyme Bioconjugates by Grafting through Technique of RAFT Polymerization using pH Responsive Polymers) organized by IGDTU for Women, Delhi, India, 2022.
- International Conference on "Frontiers in Desalination, Energy, Environmental and Material Sciences for Sustainable Development" (FDEEMSSD-2023), (New Dual Interface Polymeric Platform for Urease: Synthesis, Characterization and Application) organized by MMMUT, Gorakhpur, India.
- 3rd International Conference Innovative Research in Sciences, Technology, Agriculture, Environment, Business Management and Humanities" (STAEBM-2023), (Tailoring of Enzyme-Polymer Bioconjugates using Stimuli Responsive Polymers with Preserved Enzymatic Activity) organized by NIT Srinagar, Jammu and Kashmir, India.
- Power Progress: The International Conference on Energy, Functional Materials and Photonics (PPICEFP-2024), (RAFT Grafting through Mode Utilizing Multiple Responsive Polymer Matrix Connectors for Preserved Urease Enzyme Activity) organized by MMMUT, Gorakhpur, India.
- International Conference on Recent Innovation in Biomaterials and Tissue Engineering (ICRIBTE-2024), (Reinforcement of Urease through Encapsulation with Beta-cyclodextrin based Bioconjugates: A Comparative Analysis and Kinetic Assessment) organized by HBTU, Kanpur, India.

Reference

- **Dr. Mritunjay Kumar Shukla - CSIR-Indian Institute of Petroleum, Mohkampur Haridwar Road, Dehradun-248005, India**
  Senior Principal Scientist Head - Engineering Services Division (ESD)
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- **Prof. Tushar Jana - School of Chemistry, University of Hyderabad, Gachibowli (P.O.), Hyderabad, Telangana-500046, India**
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Declaration

- I do hereby declare that the information mentioned above is correct to the best of my knowledge. If given a chance, I will prove my efficiency, loyalty, and willingness to work.