

Dr. Somnath Yadav

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Experience

Associate Professor,

April 2021 - Present

Indian Institute of Technology (ISM) Dhanbad,

Assistant Professor

May, 2010 - April, 2021

Indian Institute of Technology (ISM) Dhanbad,

Research Associate

Aug, 2009 - April, 2009 &
December, 2007 - April, 2008

Indian Association for the Cultivation of Science, Kolkata

Post-Doctoral Fellow

April, 2008 - March, 2008

National Tsing Hua University, Hsinchu, Taiwan

Education

PhD

2007

Organic Photochemistry • Indian Association for the Cultivation of Science (Jadavpur University) • Kolkata, India.

MSc

2000

Organic Chemistry • University of Kalyani • West Bengal, India

BSc

1998

Chemistry [Honours] • University of Calcutta • West Bengal, India

Research

Catalysis and Reaction Methodology: Development of new synthetic methodologies based on metal as well as non-metal based Visible Light Photoredox Catalysis; Transition Metal Catalysis and Asymmetric Catalysis using sugar based ligands and organocatalysts.

Carbohydrate Synthesis: Synthesis of repeating units of bacterial polysaccharide as vaccine candidates. Design and synthesis of supramolecular gels from carbohydrates for environmental and oil-spill remediation.

Selected Publications

1. "Four Component Selenoazaindolylolation-Alkoxylation of Styrenes for the Synthesis of Azaindolyl Alkoxyalkyl Selenoethers" Rajib Bera, Arup Bairagi, Arunava Sengupta, Sachchida Nand Pandey, Rintu Sk., Somnath Yadav* *Organic Letters*, 2025, [10.1021/acs.orglett.5c02278](https://doi.org/10.1021/acs.orglett.5c02278)
2. "Cascade C—H-Alkenylation-Intramolecular Aminative Cyclization of Benzylsulfonamides for Synthesis of Isoindoline Cores" Arup Bairagi, Dr. Arunava Sengupta, Sohel Ali, Aditya Paul, Somnath Yadav* *Asian Journal of Organic Chemistry*, 2025, 11 [DOI: 10.1002/ajoc.202500379](https://doi.org/10.1002/ajoc.202500379)
3. "Chemical synthesis of conjugation-ready tetrasaccharide repeating unit of Escherichia coli O50 O-antigen" Sunil K. Yadav, Somnath Yadav* *Carbohydrate Research*, 2025, Article no. 109485. [DOI: 10.1016/j.carres.2025.109485](https://doi.org/10.1016/j.carres.2025.109485)
4. "Step-wise and one-pot syntheses of the trisaccharide repeating unit of Proteus penneri 71 O-antigen" Tanmoy Halder, Sunil K. Yadav, Somnath Yadav* *Carbohydrate Research*, 2025, Article no. 109581. [DOI: 10.1016/j.carres.2025.109581](https://doi.org/10.1016/j.carres.2025.109581)
5. "Total synthesis of conjugation ready repeating unit of Acinetobacter baumannii strain K141 capsular polysaccharide via a [2 + 2] convergent approach" Sunil K. Yadav, Somnath Yadav* *Carbohydrate Research*, 2025, Article no. 109478. [DOI: 10.1016/j.carres.2025.109478](https://doi.org/10.1016/j.carres.2025.109478)
6. "Total Synthesis of the Repeating Unit of the O-antigen from Proteus mirabilis OC (CCUG 10702) Serogroup O75: Step-wise and One-pot Approaches" Sunil K. Yadav, Somnath Yadav* *European Journal of Organic Chemistry*, 2024, Article no. e202400718. [DOI: 10.1002/ejoc.202400718](https://doi.org/10.1002/ejoc.202400718)
7. "A sugar-derived ligand for room temperature aerial oxidation or non-aqueous Markovnikov hydration of styrenes using a preformed or in situ generated Co complex" Sachchida Nand Pandey, Arunava Sengupta, Rajib Bera, Sohel Ali and Somnath Yadav* *Catalysis Science & Technology*, 2024. [DOI: 10.1039/D4CY00522H](https://doi.org/10.1039/D4CY00522H)
8. "Acetoxy group directed regioselective C2-alkenylation of indoles via Pd-Ag bimetallic catalysis" Aditya Paul, Arunava Sengupta, Bijan Sarkar and Somnath Yadav* *J. Org. Chem.* 2023, 88, 14413-14422 [DOI: 10.1021/acs.joc.3c01442](https://doi.org/10.1021/acs.joc.3c01442)
9. "Visible-Light Driven Acetoxylation and Dioxygenation of Indoles via Electron Donor-Acceptor Complexes" Aditya Paul, Arunava Sengupta and Somnath Yadav* *Chemical Communications*, 2023, 59, 7455-7458. [DOI: 10.1039/D3CC01683H](https://doi.org/10.1039/D3CC01683H)
10. "Organophotoredox catalyzed cross-dehydrogenative sulfonamidation of indoles and other heterocycles" Aditya Paul, Arunava Sengupta, Somnath Yadav* *J. Org. Chem.* 2023, 88, 9599-9614. [DOI: 10.1021/acs.joc.2c02022](https://doi.org/10.1021/acs.joc.2c02022)

Research Projects

1. *Synthesis of C-Aryl/Heteroaryl Glycosides via Photoredox-Catalyzed Homolysis of Glycosyl C-O Bonds: Application to the Synthesis of Neopetrosine Alkaloids A-D.*
Role: PI; Rs. 52.58 lakhs; DST-SERB, India, 2024-2026.

2. *Divergent syntheses of chondroitin sulfate and fucosylated chondroitin sulfate oligosaccharides via orthogonally protected disaccharide intermediates.*
Role: PI; Rs. 41 lakhs; DST-SERB, India, 2018-2021.
3. *Syntheses of both enantiomers of carbohydrate based organocatalysts and gelators from D- or L- arabinose and their applications in asymmetric organocatalysis.*
Role: PI; Rs. 14 lakhs; CSIR, India, 2019-2022.
4. *Development of new process chemistry towards synthesis of re-purposed drugs for potential treatment of Covid-19*
Role: PI; Rs. 24.6 lakhs; IIT (ISM), Dhanbad, 2020-2021.
5. *Synthesis of homogenous Chondroitin Sulfate oligomers with defined and specific sulfation patterns*
Role: PI; Rs. 2.0 lakhs; TEQIP III, 2018-2021.
6. *A Photochemical Approach to Surfactant Free Metal Nanoparticles and Nanoclusters and their Catalytic Applications in Organic Reactions.*
Role: PI; Rs. 27 lakhs; DST-SERB, India, 2012-2015.
7. *Photochemical synthesis of metal nanoparticles and their use in metal catalyzed organic reactions.*
Role: PI; Rs. 11.5 lakhs; ISM, Dhanbad, 2011-2014.

Research Supervision (PhD)

1. *Dr. Sunil K. Yadav, 2025:* Total Synthesis of the Repeating Units of Some Bacterial Cell-Surface Polysaccharides.
2. *Dr. Sachchida Nand Pandey, 2025:* Synthesis of Sugar based organocatalysts, ligands and their transition metal complexes for Catalytic applications
3. *Dr. Aditya Paul, 2023:* Visible Light Mediated Transformations of Organic Compounds.
4. *Dr. Sourav Nayak, 2023:* Synthesis of bacterial cell-surface glycans.
5. *Dr. Tanmoy Haldar, 2022:* Synthesis of bacterial cell-surface oligosaccharides.
6. *Dr. Navendu Pathak, 2022:* Arabinose based gelators and organocatalysts.
7. *Dr. Abhijit Paul, 2020:* A photochemical approach to surfactant free metal nanoparticles and nanoclusters and their catalytic applications in organic reactions.
8. *Dr. Debnath Chatterjee, 2020:* Syntheses of monosaccharide building blocks and their application for the synthesis of chondroitin sulfate disaccharides.
9. *Dr. Rajkamal, 2017:* Syntheses, characterization and applications of arabinose based low molecular weight organogels
10. *Arup Bairagi, ongoing:* Transition metal catalyzed reactions.
11. *Rajib Bera, ongoing:* Asymmetric catalysis.
12. *Esraphil Hossain, ongoing:* Transition metal catalyzed reactions.
13. *Rintu Sk. ongoing:* Carbohydrate Synthesis.

Research Supervision (Master's)

M.Phil. - Mr. Pankaj Kumar Singh (2013), *Asymmetric synthesis with Monosaccharide templated substrates.*

M.Sc. – 26 students

M.Tech. - 05

Teaching

Theory

Photochemistry & Pericyclic Reactions CYC514

Asymmetric Synthesis CYD505

Physical organic Chemistry

Labs

Organic Chemistry Lab CYC507

Administrative Responsibilities (Institute Level)

- Vice-Chairperson, Ph.D. Admissions: October, 2021 - September, 2023.
- Faculty-In-Charge: HRMS under CRF
- Member: Health Centre Committee
- Warden (Jasper Hostel): June, 2012 to November, 2013