



Dr. Somnath Yadav

Professional Experience

April, 2021 –

Associate Professor • Department of Chemistry & Chemical Biology • IIT (ISM), Dhanbad

May, 2010 – April, 2021

Assistant Professor • Department of Chemistry • IIT (ISM), Dhanbad

April, 2008 – March, 2009

Post-Doctoral Fellow • National Tsing Hua University, Hsinchu, Taiwan • Carbohydrate Synthesis

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

Research Associate • Indian Association for the Cultivation of Science

Education and Academics

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. "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)

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Scopus

Author ID: 8932446600

IRINS

<http://iitism.irins.org/profile/97708>



2. "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)
3. "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)
4. "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)
5. "Chemical synthesis of the O-antigen repeating unit of *Actinobacillus actinomycetemcomitans* serotype f" Tanmoy Halder, Sunil K. Yadav and **Somnath Yadav*** *Carbohydrate Research*, **2023**, 534, 108977. DOI: [10.1016/j.carres.2023.108977](https://doi.org/10.1016/j.carres.2023.108977)

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)

- (i) **Dr. Aditya Paul, 2023:** Visible Light Mediated Transformations of Organic Compounds.
- (ii) **Dr. Sourav Nayak, 2023:** Synthesis of bacterial cell-surface



glycans.

- (iii) **Dr. Tanmoy Haldar, 2022:** *Synthesis of bacterial cell-surface oligosaccharides.*
- (iv) **Dr. Navendu Pathak, 2022:** *Arabinose based gelators and organocatalysts.*
- (v) **Dr. Abhijit Paul, 2020:** *A photochemical approach to surfactant free metal nanoparticles and nanoclusters and their catalytic applications in organic reactions.*
- (vi) **Dr. Debnath Chatterjee, 2020:** *Syntheses of monosaccharide building blocks and their application for the synthesis of chondroitin sulfate disaccharides.*
- (vii) **Dr. Rajkamal, 2017:** *Syntheses, characterization and applications of arabinose based low molecular weight organogels*
- (viii) **Sacchidanand Pandey, ongoing:** *Asymmetric Synthesis using carbohydrate based organocatalysts.*
- (ix) **Sunil K. Yadav, ongoing:** *Synthesis of Chondroitin Sulfate oligosaccharides.*
- (x) **Arup Bairagi, ongoing:** *Transition metal catalyzed reactions.*
- (xi) **Rajib Bera, ongoing:** *Asymmetric catalysis.*
- (xii) **Esraphil Hossain, ongoing:** *Transition metal catalyzed reactions.*
- (xiii) **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 (2020-2021)

Theory

Photochemistry & Pericyclic Reactions CYC514

Asymmetric Synthesis CYD505

Labs

Organic Chemistry Lab CYC507

Administrative Responsibilities

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