

## Curriculum Vitae (Dr Sadhucharan Mallick)

### **Current position:**

**DR SADHUCHARAN MALLICK**

ASSISTANT PROFESSOR (Level:11)

DEPARTMENT OF CHEMISTRY

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### **Academic Background & Teaching Experience:**

**22-05-2017 – Till date:** Assistant Professor, Dept. of Chemistry, Indira Gandhi National Tribal University, Amarkantak – 484887, Madhya Pradesh, India

**26<sup>th</sup> Aug 2013– 19<sup>th</sup> May 2017:** Assistant Professor, Centre for Applied Chemistry, Central University of Jharkhand, Brambe, Ranchi.

**2007– 2013** Ph.D. in Chemistry at Indian Institute of Technology Guwahati, Assam, India. Guwahati-781039

Thesis title: Metal Nanoparticle and Polymer Composites for Antimicrobial Applications

**2005–2007:** Master of Science in Chemistry from Indian Institute of Technology Delhi, Delhi, India.

### **Honours and Awards**

(1) Qualified Joint Admission Test to M.Sc. (JAM 2005)

(2) Qualified JRF-NET (National Eligibility Test) held in June 2007, Conducted by the Council of Scientific and Industrial Research, Govt. of India.

(3) Qualified ‘Graduate Aptitude Test in Engineering (GATE– 2007)’ in Chemistry.

(4) Awarded ‘Best poster award at the 12th CRSI National Symposium in Chemistry held at the Indian institute of chemical

Technology, Hyderabad during 5-7 Feb 2010. Poster presented on Antimicrobial iodine doped silver nanoparticle –chitosan composite

### **Research Interest: Materials science**

**(1) Synthesis and characterization of metal nanoparticle:** Development of novel methods to synthesize silver, copper, and their bimetallic nanoparticles, which is stable under normal atmospheric conditions.

**(2) Synthesis of metal Nanoparticle- polymer composite materials:** Development of a new method to prepare chitosan-supported transition and Nobel metal nanoparticle composite synthesis.

**(3) Understanding the role of a surface atom in stabilizing metal nanoparticle composites and their electrochemical sensing application:**

**(4) Biological activity study:** Bacteria are unlikely to develop resistance to metal nanoparticles. We have studied the bactericidal activity of iodine-doped silver nanoparticle and copper nanoparticle chitosan composites. We are also interested in investigating the cytotoxicity effect of iodinated CS-Cu NP composite on mammalian cells. We would also investigate the molecular mechanism of copper nanoparticle-mediated cytotoxicity in both cancer and non-cancerous cells so that the potential of the composite as an anticancer agent can be evaluated. Recently we had synthesized cupric oxide nanoparticles (CuO NPs) by an aqueous leaf extract of *Moringa oleifera* and characterized it using UV-visible spectroscopy the absorption band at 340 nm. The FTIR spectrum analyzed

the functional group present in the biogenic synthesized CuO NPs. The XRD pattern the antifungal activity assessment of CuO NPs against the phytopathogenic fungi *Aspergillus flavus* and *Aspergillus niger*. The CuO NPs showed variable fungitoxic effects against *A. flavus* and *A. niger*. At higher doses (1 mg/mL), 83.51 % of mycelial inhibition was found against *A. flavus*, but 43.51 % was found against *A. niger*. The percentage inhibition of mycelial growth was found to be dose-dependent. The cell viability analysis was carried out to reveal the mechanism of the fungitoxic effect of synthesized NPs and it was revealed that the CuO NPs caused oxidative stress associated with increased ROS production, leading to fungal cell death. The synthesized CuO NPs showed single-phase cupric oxide with a monoclinic structure and highly uniform in size (3–5 nm). As the synthesized CuO NPs showed good stability under open atmospheric conditions and a fungitoxicity effect against *A. flavus*, they may be used to control fungal diseases in an eco-friendly manner.

### **Publications**

1. Banerjee M, Mallick S, Paul A, Chattopadhyay A, Ghosh SS. Heightened reactive oxygen species generation in the antimicrobial activity of a three-component iodinated chitosan-silver nanoparticle composite. *Langmuir*. 2010;26(8):5901-8. (Impact Factor 4.331)
2. Mallick S, Sharma S, Banerjee M, Ghosh SS, Chattopadhyay A, Paul A. Iodine-Stabilized Cu Nanoparticle Chitosan Composite for Antibacterial Applications. *ACS Applied Materials & Interfaces*. 2012;4(3):1313-23. (Impact Factor 10.383)
3. Mallick S, Sanpui P, Ghosh SS, Chattopadhyay A, Paul A. Synthesis, characterization and enhanced bactericidal action of chitosan supported core-shell copper-silver nanoparticle composite. *RSC Advances*. 2015;5(16):12268-76. (Impact Factor 4.036)
4. Mallick S Synthesis and characterization of Cu and Ag-based mixed metal nanoparticle composite for antibacterial applications. *Indian Journal of Chemistry-Section A* 2020;57(10):1249-56. (Impact Factor 0.80)
5. Kumari K, Singh P, Baudhh K, Sweta, Mallick S, Chandra R. Implications of Metal Nanoparticles on Aquatic Fauna: A Review. *Nanoscience & Nanotechnology-Asia*. 2019;9(1):30-43 (Impact Factor 0.761)
6. Mallick S, Mukhi P, Kumari P, Mahato KR, Verma SK, Das D 2019. Synthesis, Characterization and Catalytic Application of Starch Supported Cuprous Iodide Nanoparticles. *Catalysis Letters*. 149(12):3501-3507. (Impact Factor 2.936)
7. Prajapati J. P, Das D, Katlakunta S, Maramu N, Ranjan V, Mallick S. Synthesis and characterization of ultrasmall Cu<sub>2</sub>O nanoparticles on silica nanoparticles surface. *Inorganica Chimica Acta*. 2021; 515:120069. (Impact Factor 3.118)
8. Mallick S, Singh KRB, Nayak V, Singh J, Singh RP. Potentialities of core@shell nanomaterials for biosensor technologies. *Materials Letters*. 2022; 306:130912. (Impact Factor 3.574)

9. Rani Patra S, Choudhary M, Mallick S, Bhunia S, Das D. Incense Sticks Ash Extract, an Efficient and Sustainable Medium for Michael Addition Reaction. *ChemistrySelect*. 2021;6(48):14077-81. (Impact Factor 2.307)
10. Rani Patra S, Mallick S, Das D, Bhunia S. Effective utilization of water extract of red mud (WERM) as an alternative sustainable basic medium in Michael addition reaction. *Results in Chemistry*. 2022; 4:100335. (Impact Factor 2.3)
11. Kshitij RB Singh, Vanya Nayak, Piyali Sabui, Sadhucharan Mallick\*, Jay Singh\*, Ravindra Pratap Singh\* Bioinspired Quantum Dots: Promising Nanosystems for Biomedical application, Nano-Structures & Nano-Objects. 2022; 32:100921. (IF pending, Cite Score 11.9)
12. Piyali Sabui†, Sadhucharan Mallick†, Kshitij RB Singh, Arunadevi Natarajan, Ranjana Verma, Jay Singh\*, Ravindra Pratap Singh\* Potentialities of fluorescent carbon nanomaterials as a sensor for food analysis *Luminescence* 2022, 1. <https://doi.org/10.1002/bio.4406> †These authors have contributed equally to this work. (Impact Factor 2.613)
13. Hazra, P. P., Mondal, B., Das, D., Majhi, P., Pradhan, U., Mallick, S., . . . Roy, U. K. (2023). Multicomponent consecutive Barbier propargylation and CuAAC click reactions using Zn/CuFe<sub>2</sub>O<sub>4</sub> reagent: Entry to anti-fungal triazole compounds. *Tetrahedron*, 139, 133442. doi: <https://doi.org/10.1016/j.tet.2023.133442> (Impact Factor 2.1)
14. Prasad Prajapati, J., Toppo, A., Majhi, P., Pradhan, U., Das, A., Das, D., Sriramulu, G. Mallick, Sadhucharan, Katlakunta, Sadhana, Shukla, A. K. (2023). Biogenic Synthesis, Characterization, and Antifungal Activity Studies of Copper Oxide Nanoparticles Using Aqueous Extract of *Moringa oleifera* Leaves. 8(34), e202300531. doi: <https://doi.org/10.1002/slct.202300531> (Impact Factor 2.31)
15. Singh, K. R. B., Singh, P., Mallick, S., Singh, J., & Pandey, S. S. (2023). Chitosan stabilized copper iodide nanoparticles enabled nano-bio-engineered platform for efficient electrochemical biosensing of dopamine. *International Journal of Biological Macromolecules*, 253, 127587. doi: <https://doi.org/10.1016/j.ijbiomac.2023.127587> (Impact Factor 8.2)

### Chapter in Edited Book

1	Chapter in Edited Book	Bionanomaterials' utility for therapeutic applications	978-0-7503-3765-6	First and Principal/Corresponding author	IOP Publishing	2021	3.5
2	Chapter in Edited Book	Green Synthesis of Copper and Copper-Based Nanoparticles for Their Use in Medicine Toxicity and Safety	9781119769866	First and Principal/Corresponding author	John Wiley and Sons	2021	3.5

3	Chapter in Edited Book	Quantum dots as photon down-conversion material	9780323912068	First and Principal/Corresponding author	Elsevier	2022	3.5
4	Chapter in Edited Book	Animal and plant hormone	9780323916844	First and Principal/Corresponding author	Elsevier	2022	3.5
5	Chapter in Edited Book	Flavonoids: Chemistry, Biosynthesis, Isolation, and Biological function	9780323916844	First and Principal/Corresponding author	Elsevier	2022	3.5
6	Chapter in Edited Book	Proteins; Structure, Properties, and Importance	9780323916844	First and Principal/Corresponding author	Elsevier	2022	3.5
7	Chapter in Edited Book	Nomenclature of Organometallic Compounds.	9783527351787	Co author	John Wiley and Sons	2023	3.5
8	Chapter in Edited Book	Synthesis and Biomedical Application of Coinage-Metal Nanoparticle and Their Composite	978-981-99-1349-7	First and Principal/Corresponding author	Springer Singapore	2023	3.5

### **Technical Exposures**

**Analytical Techniques:** Interpretation of spectroscopic data (XRD, AAS, Flow Cytometer, UV-Vis spectrophotometer, fluorescence spectrophotometer, FT-IR, Dynamic light scattering (DLS) for characterization of unknown compounds. Hands on experience in UV-VIS Spectrometer, Powder X-ray diffractometer, Atomic absorption spectrophotometer, fluorescence spectrophotometer.

**Synthetic Skills:** Synthesis of metal nanoparticle, metal nanoparticle-polymer composite (micro-/nano materials) and biological activity studies.

