# Meet Dr. Sujoy Rana, Thieme Chemistry Journals Awardee 2025!


**Dr. Sujoy Rana** *joined the PhD program at the Indian Institute of Technology, Bombay (India), receiving his PhD in 2017. He was a National Postdoctoral Fellow at IISER Kolkata (India) until joining the Department of Chemistry at the University of North Bengal (India) in 2018 as an assistant professor and starting his independent career. He had a short postdoctoral stint at the University of Goettingen, Germany in 2022 as a SIRE fellow.*

**Thieme: Which field of organic chemistry are you interested in the most and why?**

**Dr. Rana:** I am very much interested in the field of electrocatalytic small-molecule activation related to energy application and development of synthetic transformations. The electrochemical organic transformation strategies provide us with the desired environment-friendly, sustainable, and efficient procedure by discarding hazardous chemical oxidants and reductants. High regioselectivity in the organic transformations is attainable by carefully tuning the applied voltage or current. Notably, in the case of electrochemical transformations, stoichiometric amounts of chemical reagents are replaced by catalytic amounts of reagent by using electrons as the mass-free reagent. The importance of the field is evident from the large number of publications in this field in recent times. Further, I am also interested in the electrocatalytic activation of greenhouse gases (e.g., $CO_2$ and $N_2O$) and other small molecules and anions towards a sustainable future.

**Thieme: Following that, what is the focus of your current research activity?**

**Dr. Rana:** Currently, my research activity focuses on the electro- and photocatalytic hydrogen evolution and $CO_2$ reduction using 3d transition metal complexes and then applying these catalysts for hydrogen atom transfer reactions and carbonylation reactions. I am also involved in 3d transition metal catalyzed electrocatalytic nitrite and nitrate reduction to form ammonia as the economical product. In addition to homogeneous catalysis, I am focusing on heterogeneous catalytic approaches for nitrite–nitrate reduction and carbon dioxide reduction through both covalent and non-covalent processes.

**Thieme: What do you think about the modern role and prospects of organic chemistry?**

**Dr. Rana:** Organic chemistry has been the most relevant field of chemistry for decades for its extensive application in every field of chemistry, be it inorganic chemistry or materials science because to synthesize a molecule you need organic chemistry!! Further, organic chemistry is the backbone of pharmaceutical and agrochemical industries having applications in the synthesis of new drug molecules and agrochemicals. Therefore, in modern times also organic chemistry has a huge role in the synthesis of new drug molecules for the prevention of new diseases, and the synthesis of new functional materials. As discussed earlier, there are huge prospects in the development of greener and environment-friendly alternatives to existing synthetic transformation methodologies using modern techniques like electrochemistry, photochemistry, and flow chemistry.

**Thieme: Which difficulties are there for young upcoming chemists in your field? Do you have any tips?**

**Dr. Rana:** The major difficulties in the field of transition-metal-catalyzed small-molecule activation are the design and successful synthesis of new ligand systems thereby achieving the desired reactivity. In some cases, the ligand synthesis becomes tricky and sometimes the designed metal-ligand complex may not show the desired reactivity. Further, detailed characterization of the intermediates and reactive species of the catalysts is also challenging. My tips are: (i) Do a thorough literature survey related to the electrocatalytic small-molecule activation chemistry so that a relationship between ligand structure and reactivity of the metal complex can be understood. Then a rational design of a ligand system should be made, so that the desired reactivity can be obtained. (ii) The successful characterization of the reactive intermediates needs repeated experiments as well as proper experimental and instrumental techniques that should be mastered by the researcher.

**Thieme: What is your most important scientific achievement to date and why?**

**Dr. Rana:** My most important scientific achievement to date is the establishment of quinoline as a redox-active moiety and its influence on the reactivity of the metal complex. Previously, the redox activity of quinolines was proved theoretically, but no experimental proof was present in the literature. We have proved the redox activity of the quinolines through experimental findings using cyclic voltammetry and electron paramagnetic resonance (EPR) studies which were further supported by theoretical studies.

**Thieme: Could you tell us something about yourself outside the lab, such as your hobbies or extra-work interests?**

**Dr. Rana:** I love to play badminton, watch football at leisure, and spend time with my family and friends.