Meet Dr. Hemant Joshi, Thieme Chemistry Journals Awardee 2025!

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Dr. Hemant Joshi *is an assistant professor of chemistry at the Central University of Rajasthan (CuRaj), India. He earned his undergraduate degree in chemistry (BSc) from the University of Rajasthan, India, in 2008, and his Master's degree from the Malaviya National Institute of Technology, Jaipur, India, in 2010. He then joined the PhD program at the Indian Institute of Technology Delhi, India. In early 2016, Hemant moved to Texas A&M University, College Station, USA, for postdoctoral research. In August 2018, Hemant returned to India and joined BITS Pilani, Pilani Campus, as a DST Inspire Faculty. In June 2019, he began his independent research career at the Central University of Rajasthan, Ajmer.*

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

Dr. Joshi: From the early stage of my research career, I have been captivated by the concept of selectivity in organic synthesis. It is exciting to witness how a carefully designed catalyst can fine-tune the selectivity of organic transformations. By introducing new selectivity paradigms through catalyst design, we open the door to the creation of novel organic molecules that are difficult to access via conventional methods. My strong interest in this area of organic chemistry stems from the fascinating yet challenging chemistry it involves.

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

Dr. Joshi: Since my doctoral research, I have been trained in the field of homogeneous catalysis using transition-metal complexes. Building on this foundation and my research interests, the current focus of our group is to design new metal complexes that can serve as homogeneous catalysts for various chemo- and regioselective organic transformations. Over the past six years of my independent research career, we have developed several new metal catalysts featuring air- and moisture-insensitive organochalcogen ligands, which have successfully catalyzed chemo- and regioselective organic transformations, as illustrated in Figure 1.[1–7]

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

Dr. Joshi: Organic chemistry is a foundation of modern science, driving developments in multiple fields like materials science, environmental technology, biological sciences, and pharmaceuticals. It is a dynamic discipline, constantly evolving in response to emerging challenges and seamlessly integrating with cutting-edge technologies. The future of organic chemistry is promising, fueled by ongoing interdisciplinary research that pushes the boundaries of what is possible. For instance, during my postdoctoral research work, we worked on artificial molecular machines. Many other research groups have made significant strides in developing fascinating molecular machines, further advancing

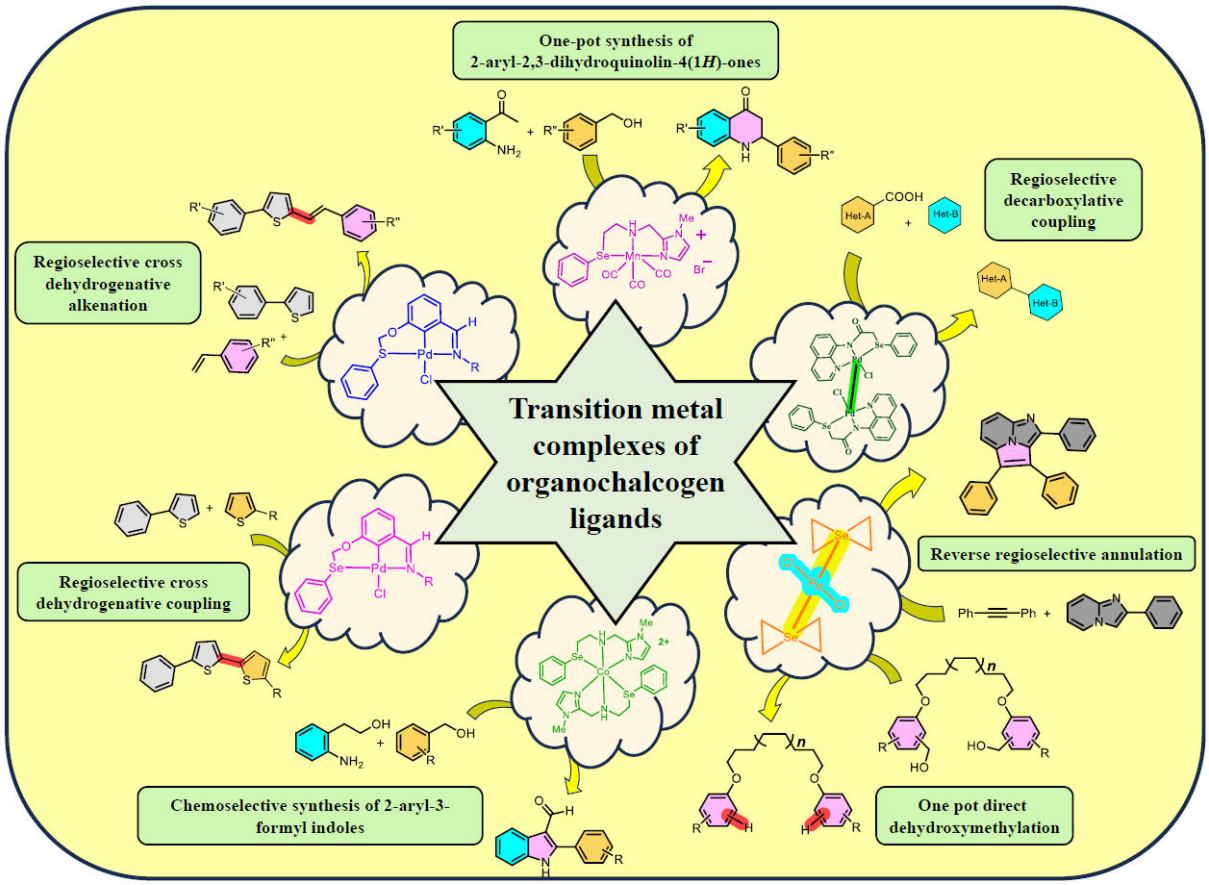

Figure 1 Overview of the current research interests of Dr. Joshi's research group.

the frontiers of organic chemistry and enabling innovations in nanotechnology, such as molecular lifts and miniature memory chips. Additionally, the fine-tuning of catalyst design to achieve selective organic transformations that are difficult via conventional methods has been a particularly intriguing aspect. These breakthroughs underscore the transformative potential of organic chemistry in shaping the future of interdisciplinary research. Nonetheless, a key challenge in synthetic chemistry is the sustainability, prompting chemists to continually explore green alternatives. I am certain that the field is poised for an innovative future ahead.

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

Dr. Joshi: The primary challenge for young chemists is establishing their independent identity through high-quality work. In the early stages of their careers, research can often become demanding, requiring more time and effort. During such times, it is crucial to prioritize mental health and maintain a healthy work–life balance. Additionally, securing sufficient funding for research remains a significant challenge. To cope with all these setbacks, I will quote a piece of advice my mentor gave me: "Focus on solving problems, not just publishing papers".

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

Dr. Joshi: We designed parachute-like multi-ringed metal complexes that demonstrated an unprecedented molecular triple jump. These molecules hold significant potential, as they could serve as the foundation for designing and developing functional molecular machines capable of manipulating matter at the atomic level.[8] In my independent research, my group has developed several intriguing metal complexes capable of tuning the selectivity of organic reactions. For example: (I) A *trans*-palladium complex with an organoselenium ligand can reverse the regioselectivity of the annulation reaction between 2-arylimidazo[1,2-*a*]pyridines and diphenylacetylene.[1] (II) An octahedral cobalt complex with an organoselenium ligand can control the chemoselectivity of the reaction between 2-(2-aminoaryl)ethanols and benzyl alcohols, enabling the selective synthesis of 2-aryl-3-formylindoles.[5] (III) A Mn(I)-NNSe pincer complex catalyzes the dehydrogenative cyclization of 1-(2-aminophenyl)ethanone using primary alcohols to synthesize 2-aryl-2,3-dihydroquinolin-4(1*H*)-ones, under base-, additive-, solvent-, or hydrogen-acceptor-free conditions.[7]

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

Dr. Joshi: I truly enjoy spending time with my family. Long drives, watching movies from different cultures, savoring good food, and playing with my daughter are some of my favorite activities. Additionally, I find gardening to be a relaxing hobby that allows me to appreciate the beauty of nature.

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