

Meet Dr. Srinivas Dharavath, Thieme Chemistry Journals Awardee 2025!



Dr. Srinivas Dharavath is currently an associate professor at the Indian Institute of Technology Kanpur (India). After obtaining his PhD from the University of Hyderabad (India) in 2014, he remained there for his first postdoctoral position. He carried out additional postdoctoral studies at the University of Idaho (USA; 2015–2017) and McMaster University (Canada; 2017–2019). Prior to assuming his current position, he was an assistant professor at IIT Kanpur from 2019 to 2024.

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

Dr. Dharavath: I am interested in energetic materials chemistry because it combines fundamental organic chemistry with applied science to develop high-performance explosives, propellants, and pyrotechnics.

This field is crucial for civilian and defense applications, including mining, aerospace propulsion, and demolition. Understanding molecular structures, stability, and reaction mechanisms allows for the design of safer, more efficient, and environmentally friendly energetic compounds. The main challenge in this field is to balance high energy output with stability and safety, which makes this field both scientifically fascinating and practically impactful.

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

Dr. Dharavath: Our research focuses on designing, synthesizing, and characterizing novel energetic materials with enhanced performance and safety. This includes exploring new molecular architectures that increase energy density while maintaining thermal and mechanical stability. Additionally, we investigate the decomposition mechanisms and reaction kinetics of energetic compounds to better understand their behavior under different conditions. Our work mainly involves developing environmentally friendly alternatives to traditional explosives and propellants, aiming to reduce toxicity and environmental impact without compromising efficiency. To achieve this goal, we have also started synthesizing and applying metal-organic frameworks (MOFs) and covalent organic frameworks (COFs). By integrating experimental techniques with computational modeling, we strive to advance the science of energetic materials for civilian and defense applications.

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

Dr. Dharavath: Organic chemistry drives modern science and technology, enabling breakthroughs in pharmaceuticals, materials science, energy, and environmental sustainability. Designing and manipulating molecular structures has given rise to life-saving drugs, high-performance polymers, and cutting-edge materials for electronics and energy storage. The field is increasingly focused on green chemistry, aiming to minimize waste, reduce hazardous byproducts, and develop biodegradable alternatives. Its integration with biotechnology has revolutionized medicine, leading to innovations like targeted therapies and bio-based materials. From sustainable fuels to advanced energy storage systems, organic chemistry is at the forefront of addressing pressing global challenges. The future of organic chemistry is being shaped by computational tools, machine learning, and automation, which may accelerate reaction optimization and molecular design. In areas such as energetic materials, organic electronics, and nanotechnology, the field continues to push the boundaries of innovation. As the world grapples with climate change and energy shortages, organic chemists are developing eco-friendly alternatives and sustainable solutions. With its ever-expanding impact across disciplines, organic chemistry remains a cornerstone of scientific progress, paving the way for a cleaner, safer, and more sustainable future.

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

Dr. Dharavath: Young chemists entering the field of energetic materials chemistry face several challenges, ranging from safety concerns to limited accessibility of specialized resources. Handling and synthesizing high-energy compounds require strict safety protocols, specialized equipment, and well-controlled environments, which can be intimidating for newcomers. Additionally, research in this field often involves regulatory restrictions due to the potential dual-use nature of energetic materials, making access to certain chemicals and collaborations more challenging. Furthermore, as the field is highly interdisciplinary, combining organic chemistry, materials science, and computational modeling, young researchers may find it overwhelming to develop expertise across

multiple domains. To overcome these challenges, aspiring chemists should focus on building strong fundamentals in organic synthesis and analytical techniques while gaining hands-on experience in safety procedures. Seeking mentorship from experienced researchers and actively engaging with experts is very important. Applying machine learning and artificial intelligence to make sustainable materials will be beneficial, as these areas are increasingly shaping the future of research on energy materials. Finally, perseverance and a strong problem-solving mindset are crucial, as working with energetic materials often involves navigating complex synthesis routes and unpredictable reaction behaviors.

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

Dr. Dharavath: I have not yet reached my ultimate goal, but everything I have developed in my lab is moving in the right direction and will serve the intended purpose. The progress so far is promising, and we are on track to achieve our goals. While challenges remain, our research is steadily advancing, and we will be reaching our objectives. Each step brings us closer to breakthroughs that will have a meaningful impact in the field of energetic materials.

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

Dr. Dharavath: Outside the lab, I enjoy participating in various sports, especially in the early morning. I wake up at 5:30 AM and prioritize starting my day with physical activity, which keeps me energized and focused. Watching sports is another passion, and I particularly enjoy playing with my friends. While I make it a rule to take Sundays off, I often find it hard to completely disconnect. I like driving most. Balancing work with my personal life helps me stay motivated and maintain a well-rounded lifestyle.