National Institute of Technology Rourkela

Synopsis Seminar

Seminar Title	: Molecular Design, Synthesis and Evaluation of Biological Properties of Transition Metal Complexes Incorporating N2O2 and ONO-donor Ligands
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Supervisor	: Rupam Dinda
Venue	: Chemistry Department Seminar Room (MC 319)
Date and Time	: 10 Sep 2025 (04.00 PM)

Abstract : Since the discovery of cisplatin, transition metal complexes have played a crucial role in anticancer research. So, the coordination chemistry of non-platinum d-block transition metal complexes, particularly those of vanadium, copper, and molybdenum, has attracted significant attention due to their diverse biological activities. These include insulin-mimetic behavior, DNA binding and photo-induced cleavage, inhibition of cancer cell proliferation, and significant roles as anti-inflammatory, antibacterial, and antifungal agents. Among these metals, vanadium is known for forming stable protein-adducts that influence uptake, transportation, storage, and toxicity in biological systems. Their resemblance to metalloproteins makes these complexes valuable models for understanding biological mechanisms and therapeutic potential. Again, copper-coordinated complexes have drawn special attention for their biological redox potential and strong nucleobase affinity. Based on several literature reports, Cu-complexes may be a better alternative than many platinum-based drugs as they may efficiently interact with DNA through non-covalent interactions and can inhibit uncontrolled cell growth. On the other hand, molybdenum not only exhibits notable biological relevance but is also widely applied in industrial and catalytic processes, making it one of the most studied transition metals. These observations have motivated me to focus on my present thesis work, which comprises molecular design, synthesis, and evaluation of the biological properties of the above-mentioned transition metal complexes incorporating N_2O_2 and ONO-donor ligands.