

PhD Open Seminar

Department of Chemistry, IISER Bhopal

Speaker: **Ms. Jyoti Rai (1310206)**

Thesis Supervisor: **Dr. J. Sankar**

Topic of Seminar: **Homometallic Corrole-Porphyrin-Corrole Triads: Characterization and Study of Catalytic Behaviour**

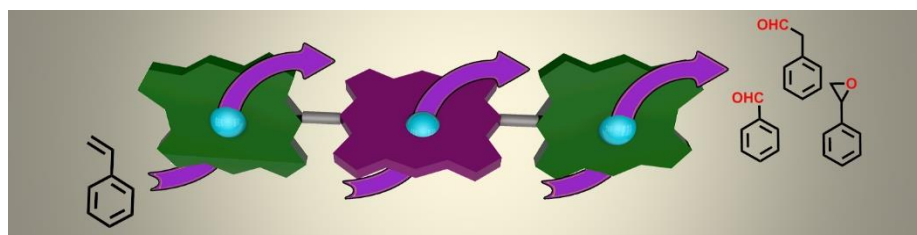
Date: **26th November, 2018**

Time: **4:00 pm**

Venue: **AB2-401**

Abstract: Metalloenzymes are known to catalyze a variety of important biological processes in nature, involving complex chemical transformations, which exhibit astounding examples of efficient and selective catalysis.^[1] These chemical transformations are usually very challenging synthetically as they are multi-electron redox reactions.^[2] Simplified systems that consider small molecules as models, have been engaged to mimic structural and functional features of enzymes.^[3] Cytochrome P450 enzymes constitute a large family of heme proteins that can perform oxidation of various substrates at high catalytic rates using molecular oxygen through reductive activation mechanism.^[4] In all these systems, it is speculated that enzymes have one or more metals at their active site and may also include metals at their active peripheral sites as well.^[5]

Although metalloporphyrins and metallocorroles are exploited extensively in catalysis but till now most of these studies are limited to monomer macrocyclic metal complexes in these organic transformations. Modular systems incorporating more than two catalytic centres in the same entity have not been approached in the field of porphyrinoids due to challenging synthetic complexity. As part of the development towards multi-metal catalyzed chemical transformations, I would like to present my research work on synthesis and characterization of various homometallic corrole-porphyrin-corrole^[6] triads and study of their catalytic potential in some organic transformations.



References:

- [1] Zastrow, M. L.; Pecoraro, V. L. *Coord. Chem. Rev.* **2013**, *257*, 2565-2588.
- [2] T. L. Poulos, *Chem. Rev.* **2014**, *114*, 3919-3962.
- [3] P. Dydio, H. M. Key, A. Nazarenko, J. Y-E. Rha, V. Seyedkazemi, D. S. Clark, J. F. Hartwig, *Science* **2016**, *354*, 102-106.
- [4] E. G. Hrycay, S. M. Bandiera, *Adv. Exp. Med. Biol.* **2015**, *851*, 1-61.
- [5] R. J. P. Williams, *Chem. Commun.* **2003**, *0*, 1109-1113.
- [6] M. Murugavel, R. V. R. Reddy, J. Sankar, *RSC Adv.* **2014**, *4*, 13669-13672.