

## **Seminar**

### **Key Intermediates in NHC-catalysis, Photoredox Carboxylation, Decarboxylation and Ni-catalyzed Reductive Deaminative Arylation at $sp^3$ Carbon Centers**

**Veera Reddy Yatham**

**CSIR-IICT, Hyderabad**

N-heterocyclic carbenes catalyzed Umpolung of aldehydes involves the formation of several intermediates i.e., Breslow-intermediates (diamino enols), diamino dienols and azolium enolates. Part of this lecture will be discussed on key Intermediates in NHC-umpolung of aldehydes, address the problems and the solutions in NHC-umpolung of enals.

Visible-light photocatalysis is a powerful tool to generate various chemical motifs under mild reaction conditions. Most of the chemical reactions are initiated by either Ir, or Ru complexes via single electron transfer (SET) through Metal to Ligand Charge Transfer (MLCT). Also, recently, visible-light induced Ligand to Metal Charge Transfer (LMCT) emerged as a robust alternative to generate radical species by the homolysis of the metal-ligand bond. In this part, I will discuss the first example of redox neutral di-carbo functionalization of styrenes with  $CO_2$  and with carbon radicals (which are generated through MLCT by Ir-complex). Also, I will discuss one example how to utilize simple  $CeCl_3$  as a photocatalyst through LMCT to get valuable compounds from simple precursors, also application of this methodology for the late stage fictionalizations of drug candidates.

Most of the metal catalyzed cross coupling reactions was conducted by employing halo compounds as coupling partners. In this context of coupling partners, the abundance of alkyl amines in pharmaceuticals and pre-clinical candidates makes them to utilize as a coupling partner in cross-coupling arena will add a significant value to synthetic community. In this part, I will discuss a methodology how to utilize these alkyl amines as carbon electrophile in coupling reactions, also application of this methodology for late fictionalization of amine containing drugs.

***Wednesday, Sep 18<sup>th</sup> 2019***

***4:00 PM (Tea/Coffee at 3:30 PM)***

***Seminar Hall, TIFR-H***