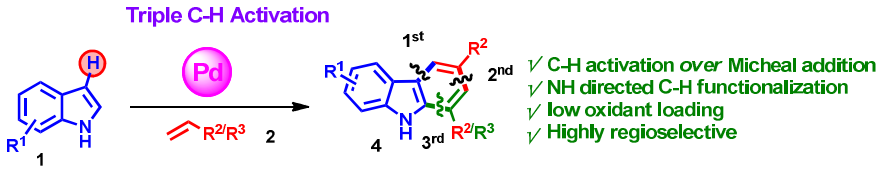
Indole Directed C-H Activation: Direct Synthesis of Functionalized Carbazoles from Indoles via Triple C-H Activation

Akhilesh Verma

Department School of Physical Sciences (SPS), Jawaharlal Nehru University, Delhi-119967, India, New Delhi, India

Synthesis of small heterocyclic molecules in terms of selectivity, operational simplicity, functional group tolerance and environmental sustainability are in constant demand as majority of drugs; drug-like compounds contain hetero atom at their core. Since the discovery of the first intermolecular alkenylation (discovery of first C-H activation) by Fujiwara and Moritani in 1967.[1] Literature revealed that second successive alkenylation on alkene obtained by the first oxidative Heck is still unknown. In continuation of our ongoing work on the coupling reactions using in-house developed ligands[2] in this presentation I we would like to discuss about our recent success on the synthesis of highly functionalized carbazoles from NH-indoles via palladium-catalyzed triple successive C-H activation.



R^1 = H, Br,OMe, NO_2, vinyl, aryl; R^2/R^3 = COOMe, COOEt, COO^nBu, COMe, Ph

1. (a) Moritani, I.; Fujiwara, Y. *Tetrahedron Lett.* **1967**, *12*, 1119. (b) Fujiwara, Y.; Moritani, I.; Matsuda, M.; Teranishi, S. *Tetrahedron Lett.* **1968**, *5*, 633

2. (a) Verma, A. K.; Kesharwani, T.; Singh, J.; Tandon, V.; Larock, R. C. *Angew. Chem. Int. Ed*, **2009**, *48*, 1138. (b) Verma, A. K.; Jha, R. R.; Chaudhary, R.; Tiwari, R. K.; Reddy, K.S.K.; Danodia, A. *J. Org. Chem.* **2012**, *77*, 8191. (c) Verma, A. K.; Joshi, M.; Singh, V. P. *Org. Lett*. **2011**, *13*, 1630. (d) Joshi, M.; Patel, M.; Tiwari, R.; Verma, A. K. *J. Org. Chem.* **2012**, *77*, 5633. (e) Verma A. K.; Jha, R. R.; Chaudhary, R.; Tiwari R. K.; and Danodia, A. *Adv. Syn. Cat.* **2013**,*355,421-436. (f)* Verma **A. K.;** Patel M.; Joshi M.; Likhar P. r.; Tiwari R. K.; Parang K. *J. Org. Chem.* **2014**, *78*, 6657–6669