

Ph.D. Open Seminar

Department of Chemistry, IISER Bhopal

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Title: Organocatalytic asymmetric construction of benzospiroketal, benzodiquinane and benzospirononane

Date: 10/12/2018 (Monday)

Time: 4 PM

Venue: AB2-401

Abstract: Organocatalysis prevails the asymmetric synthesis over the last decade onwards, beginning with iminium-enamine catalysis¹ and continuing the development at its full phase, with bifunctional H-bonding catalysis². Regardless of many advanced name reactions, Michael reaction (*carba-/oxa-Michael*) receives the attention of synthetic chemist, in the way to construct complex cyclic cores resembling natural scaffold. In this talk, I will introduce keto tethered formyl chalcones and its other variants as substrates, emerging with new reactivity to formulate the key fused- and spiro-cyclic substructures. Here, I am mainly going to focus on discussing, the asymmetric *oxa-/carba-Michael* strategies for the construction of benzospiroketals, benzodiquinane, and benzospirononane^{3a-c} (Figure1), using both bifunctional H-bonding and iminium-enamine catalysis which provided an excellent enantio- and diastereoselectivity of the *oxa-/carba-cycles*. The detailing starts with benzospiroketal synthesis using alkoxyboronate spiroketalisation and *oxa-Michael* reaction of peroxy hemiacetals. Next, the synthesis of benzodiquinane and benzospirononane, containing multiple stereocenters one of which is an all-carbon quaternary stereocenter, have been developed using reductive *carba-Michael* addition cascade.

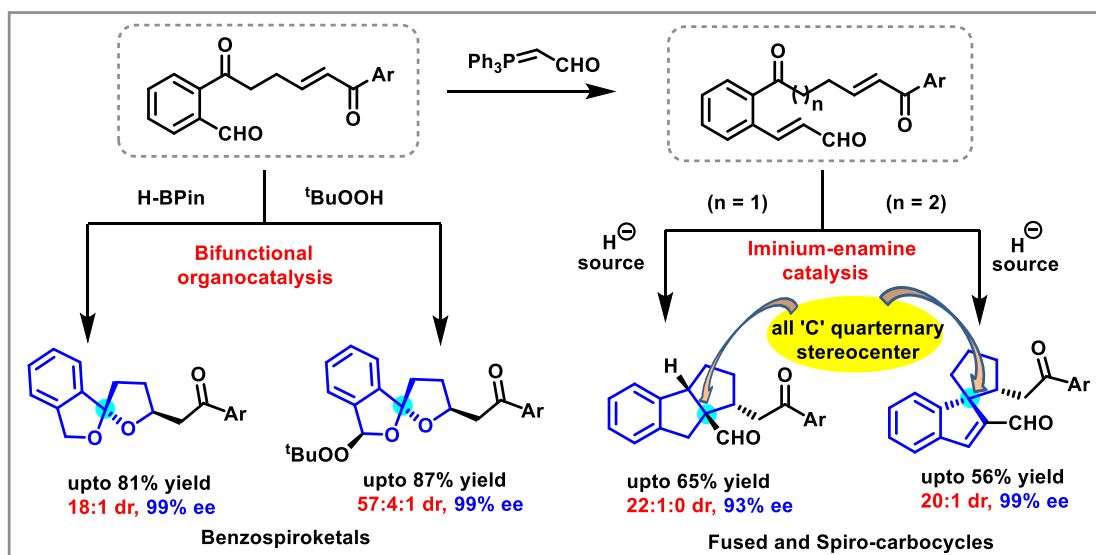


Figure1: Schematic representation of benzospiroketals and carbocycles synthesis.

- (a) A. Erkkila, I. Majander, P. M. Pihko, *Chem. Rev.* **2007**, *107*, 5416. (b) W. Notz, F. Tanaka, C. F. Barbas, *Acc. Chem. Res.* **2004**, *37*, 580.
- (a) M. S. Taylor, E. N. Jacobsen, *Angew. Chem., Int. Ed.* **2006**, *45*, 1520. (b) B. Ravindra, B. G. Das, P. Ghorai, *Org. Lett.* **2014**, *16*, 5580.
- (a) **A. Midya**, S. Maity, P. Ghorai, *Chem. Eur. J.* **2017**, *23*, 11216. (b) **A. Midya**, L. D. Khalse, P. Ghorai, *Manuscript under preparation*. (c) **A. Midya**, L. D. Khalse, P. Ghorai, *Manuscript under preparation*.