

Ph.D. Open Seminar

Department of Chemistry, IISER Bhopal

Speaker: **Mr. Gurupada Hazra**

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Title: Asymmetric Organocatalytic Cascade Cyclisation for Benxoxaboroles, Isobenzofuryl Phosphonates, 2-Thioxo Quinolones

Date: **30/01/2019 (Wednesday)**

Time: 4 pm

Venue: L3-LHC

Abstract: Asymmetric organocatalysis is one of the most attractive areas of research in recent time.¹ Bifunctional organocatalysis, where simultaneous co-ordinations between the reactants to provide a pre-organized intermediate in a well define orientation, is an important prerequisite for asymmetric induction. Such strategies have been found major attention in the design and synthesis of architecturally novel molecules. On the other hand cascade reaction is a very attractive synthetic strategy for the synthesis of complex molecule in shorter reaction pathway. Many biologically active molecules and natural products containing either cyclic or oxa-cyclic core are synthesized by intramolecular cascade cyclisation reaction². For example, benzoxaboroles,^{3a} isobenzofurans, quinolines are the important organic molecules showed biological activity with or without any asymmetric center. Developing the asymmetric synthesis protocols for such molecules might provide better platform to find their application in pharmaceuticals or elsewhere. Here, I will discuss how such a cascade reactions are designed to synthesize various core structures, such as 3-substituted benzoxaboroles, 1,3-dihydroisobenzofuryl phosphonates and 2-thioxo 1,4-dihydroquinolines in asymmetric way by using chiral bifunctional organo catalyst³ (Figure 1).

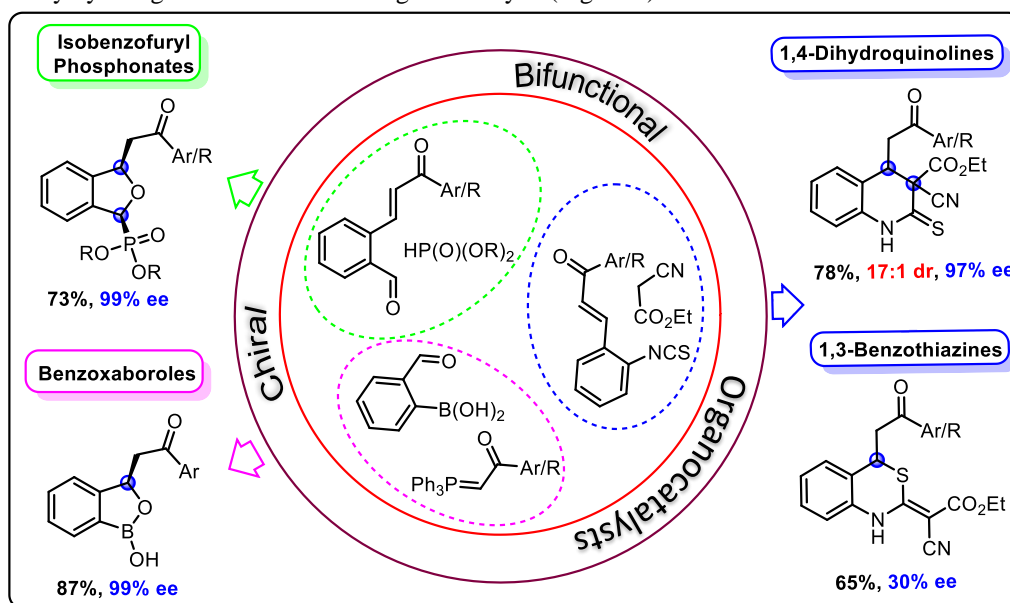


Figure 1: Synthesis of chiral heterocycles by using bifunctional organocatalysts.

1. a) List, B. *Org. Biol. Chem.* **2005**, 719; b) Chauhan, P.; Mahajan, S.; Kaya, U.; Hack, D.; Enders, D. *Adv. Synth. Catal.* **2015**, 357, 253.
2. a) Barnala, R.; Das, B.G.; Ghorai, P. *Org. Lett.* **2014**, 16, 5580; b) Maity, S.; Parhi, B.; Ghorai, P. *Angew. Chem., Int. Ed.* **2016**, 55, 7723.
3. a) Adamczyk-Wozniak, A.; Borys, K. M.; Sporzyn'ski, A. *Chem. Rev.* **2015**, 115, 5224; b) **Hazra, G.**; Maity, S.; Bhowmik, S.; Ghorai, P. *Chem. Sci.* **2017**, 8, 3026. c) Maity, S.; Saha, M.; **Hazra, G.**; Ghorai, P. *Org. Lett.* **2017**, 19, 5872. d) **Hazra, G.**; Pratap, S.; Ghorai, P. *J. Org. Chem.* **2018**, 83, 9654. e) **Hazra, G.**; Kamilya, C.; Ghorai, P. manuscript under preparation.