

Ph.D. Open Seminar

Department of Chemistry, IISER Bhopal

Topic of Seminar: "Organocatalytic Enantioselective C-S and C-C Bond-Forming Reactions:
Applications in Organic Synthesis"

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Roll No.: 1010202

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Time: 5.00 PM

Venue: AB-II, 401

Abstract

Asymmetric organocatalysis is one of the general approaches for the catalytic synthesis of enantiomerically enriched organic compounds. It complements bio- and metal-catalysis. Since 2000, organocatalysis has grown explosively and has become one of the most exciting research areas in current organic chemistry.¹

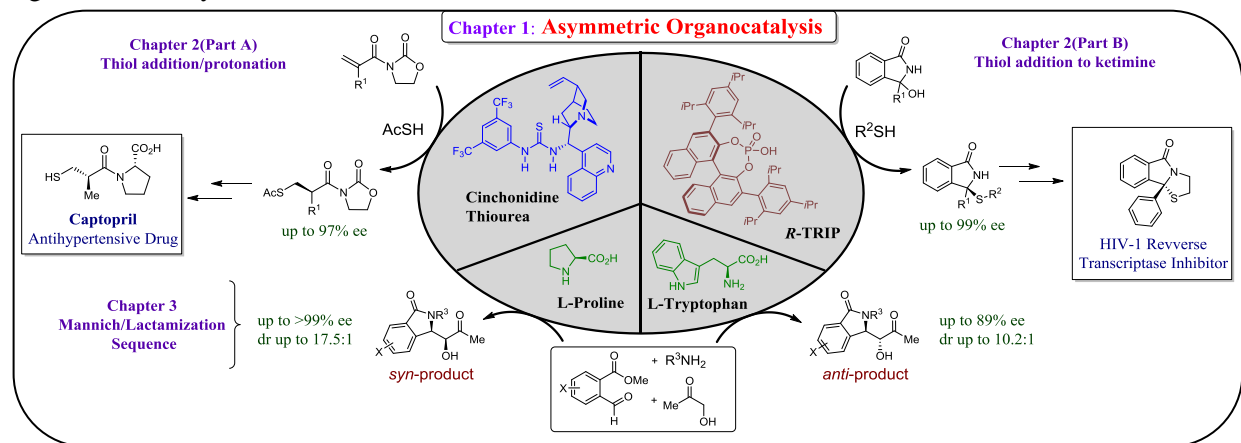


Figure 1: Asymmetric organocatalysis for synthesis of enantioenriched compounds

In this context, during my doctoral studies, I undertook the task of development of asymmetric organocatalytic methodologies for the synthesis of enantioenriched compounds (Figure 1).^{2,3,4a} In this seminar, I would like to give a literature overview on organocatalytic asymmetric processes (**Chapter 1**).¹ In **Chapter 2,(Part A)** cinchona alkaloid derived thiourea catalyzed enantioselective transient enolate protonation in conjugate addition of thioacetic acid to α -substituted *N*-acryloyloxazolidinones will be discussed.² **Chapter 2,(Part B)** deals with a chiral phosphoric acid catalyzed enantioselective addition of thiols to *in situ* generated ketimines for stereoselective access to isoindolinone-derived *N,S*-ketals. The methodology was applied for the synthesis of non-nucleoside HIV-1 Reverse Transcriptase Inhibitor.³ An organocatalytic (*via* enamine catalysis) enantioselective one-pot three component Mannich–lactamization sequence for the synthesis of isoindolinones will be presented in the **Chapter 3**.⁴

References:

- (a) Berkessel, A; Groger, H. *Asymmetric Organocatalysis-From Biomimetic Concepts to Applications in Asymmetric Synthesis*; Wiley-VCH Verlag GmbH & Co. KGaA: Weinheim, Germany, **2005**. (b) MacMillan, D. W. C. *Nature* **2008**, *455*, 304. (c) Seayad, J.; List, B. *Org. Biomol. Chem.*, **2005**, *3*, 719.
- (a) Unhale, R. A.; Rana N. K.; Singh, V. K.; *Tetrahedron Lett.* **2013**, *54*, 1911; (b) Rana, N. K.; Unhale, R.; Singh, V. K. *Tetrahedron Lett.* **2012**, *53*, 2121; (c) Rout, S.; Ray, S. K.; Unhale, R. A.; Singh, V. K. *Org. Lett.* **2014**, *16*, 5568.
- Unhale, R. A.; Molleti, N.; Rana, N. K.; Dhanasekaran, S.; Singh, V. K. *Manuscript under preparation*.
- (a) Bisai, V.; Unhale, R. A.; Suneja, A.; Dhanasekaran, S.; Singh, V. K. *Org. Lett.* **2015**, *17*, 2102. (b) Dhanasekaran, S.; Bisai, V.; Unhale, R. A.; Suneja, A.; Singh, V. K. *Org. Lett.* **2014**, *16*, 6068.

All are cordially invited to attend.