

Ph.D. Colloquium Seminar

Nitrosoaldol and Mannich Based Cascade Reactions towards Synthesis of  $\alpha$ -Ketoamides and Heterocycles

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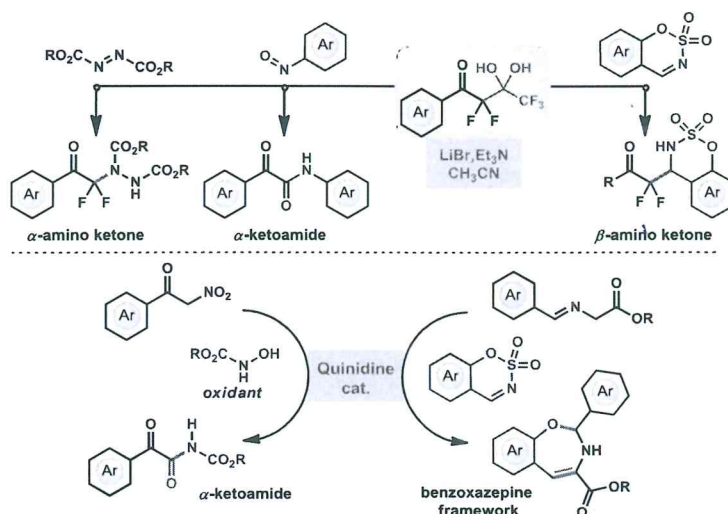
Date: 03.03.20

Guide: Dr. Md. Mahiuddin Baidya

Time: 4.15 pm, Venue: 310

Abstract

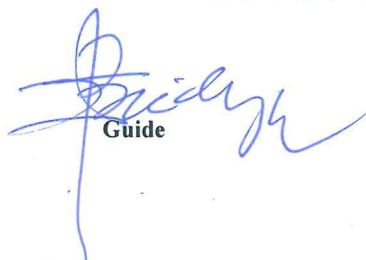
Cascade reactions constitute a fascinating branch of organic chemistry that has been the subject of intense research in recent years.<sup>1</sup> The delicacy of the cascade processes lies on novel features such as high atom-economy, step-economy, low waste generation etc., while multiple bond-forming and/or bond-breaking processes occur to fabricate higher molecular complexity.<sup>1</sup> These characteristics also bode well with the principles of "green chemistry".<sup>2</sup> In this context, we are interested in developing the anionic cascade reactions for the construction of biologically and synthetically important molecular frameworks using simple and readily available starting materials. We have exploited enolates generated *in situ* from  $\alpha$ -fluorinated *gem*-diols as well as  $\alpha$ -nitroketones in nitroso aldol cascade to furnish useful  $\alpha$ -ketoamides in high yields (Scheme 1).<sup>3</sup> Further, *in situ* formed *gem*-difluoroenolates were utilized in Mannich reaction to access *gem*-difluoro-adorned  $\beta$ -amino ketones. Guided by the principle of anionic cascade, a novel strategy towards benzoxazepine heterocyclic frameworks has also been developed that follows a formal (3+2) cascade annulation of azomethine ylide with cyclic sulfamate derived imines (Scheme 1). In this seminar, development of these cascade strategies will be presented in details.



Scheme 1.

References

- (1) a) Tietze, L. F., Brasche, G., Gericke, K. Domino Reactions in Organic Synthesis, Wiley-VCH, Weinheim, 2006, p. 672. (b) Tietze, L. F. *Chem. Rev.* 1996, 96, 115. (c) Nicolaou, K. C., Edmonds D. J., Paul G. B. *Angew. Chem. Int. Ed.* 2006, 45, 7134.
- (2) Anastas, P. T., Warner, J. C. Green Chemistry: Theory and Practice, Oxford University Press: New York, 1998, p.30.
- (3) a) Reddy, M. K., Mallik, S., Ramakrishna, I., Baidya, M. *Org. Lett.* 2017, 19, 1694. b) Reddy, M. K., Ramakrishna, I., Baidya, M. *Org. Lett.* 2018, 20, 4610.

  
Guide

  
Seminar Coordinator

  
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