

University of Louisville
Department of Chemistry
Shramana Ghosh
Literature Seminar

When: November 17, 2022

Time: **2:00 p.m.**

Location: CBL-16

Ketamine: An Anesthetic and Modern Antidepressant

Abstract:

Ketamine is an arylclohexylamine derivative which was first introduced into clinical practice in the 1960s. Due to its' various neurophysiological properties starting from anesthesia and analgesia to depression and schizophrenia, it continues to fascinate the scientific community. The lecture will entail a review of the biological properties and biomedical applications of the molecule as well as the recent synthetic efforts towards ketamine synthesis. Lu and coworkers published their work on the efficient asymmetric synthesis of (*S*)-ketamine based on catalytic enantioselective transfer hydrogenation of cyclic enone and [3, 3]-sigmatropic rearrangement of allylic cyanate to isocyanate.¹ Zhang and coworkers introduced a concise, recyclable and efficient process for the preparation of (*S*)-ketamine via classic resolution combined with the recycling of undesired isomer. Both of these two methods can be applied for the preparation of (*S*)-norketamine also.² George and coworkers presented a telescoped multi-step continuous flow synthesis of norketamine which is high yielding and possesses various processing advantages for industrial production.³ During the lecture, the history of this molecule and its' many applications and potential in the field of chemical neuroscience and neuropharmacology will be discussed.

References:

1. Chen, C.; Lu, Xi.; "Enantioselective Synthesis of (*S*)-Ketamine and (*S*)-Norketamine", *Org. Lett.* **2019**, *21*, 6575 – 6578
2. Gao, S.; Gao, Xu.; Wu, Z.; Li, H.; Yang, Z.; Zhang, F.; "Process for (*S*)-Ketamine and (*S*)-Norketamine via Resolution Combined with Racemization", *J. Org. Chem.* **2020**, *85*, 8656-8664
3. Marcos, V. H.; Jonathan, C. M.; Rowena A. H.; Richard, A. C.; Samuel L. B.; Gareth, N. J.; Peter L.; Martyn P.; Michael, W. G.; "High Yielding Continuous-Flow Synthesis of Norketamine", *Org. Process. Res. Dev.* **2022**, *26*, 1145-1151