Poster Presentation
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"Asymmetric Total Synthesis of Lysergine and Isolysergine"

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Abstract: Pharmacologically important clavine (**1a-c**) alkaloids are subclass of ergot alkaloids (**2a-e**) and are produced mainly by fungi of the families *Clavicipitaceae*.[1] Most ergot alkaloid structures contain a tetracyclic ergoline ring system (**1b-c**, **2a-e**, and **3a-b**), except cycloclavine (**1a**), which is sharing a pentacyclic framework with a vicinal all-carbon stereogenic centers.[1c] Reportedly, members of this family possess a broad spectrum of pharmacological activities, which include modulation of blood pressure, control of the secretion of pituitary hormones, migraine prevention, and dopaminergic and neuroleptic activities.[1b-c] Because of the varied and powerful biological activities of several congeners of this family, these alkaloids have long attracted the interests of synthetic chemists.

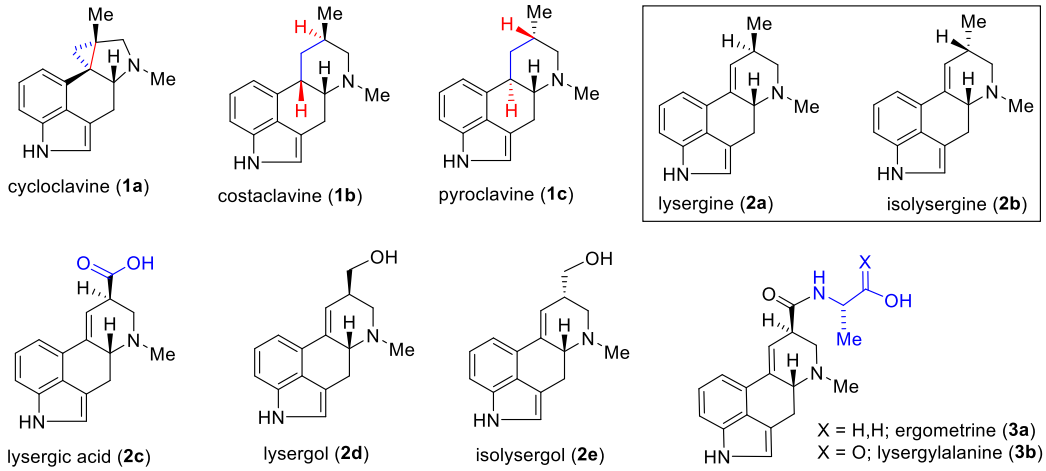

Figure. Selected naturally occurring clavine alkaloids (**1a-c**), lysergine alkaloids (**2a-e**) and **3a-b**.

Although few approaches to the total syntheses of this class of alkaloids have been reported,[2] however, majority of them are in racemic form. In this context, development of a unified asymmetric approach to synthesize majority the congeners remains still challenging.[3] Due to their immense biological activities, our group undertook in developing unified strategy for the total syntheses of clavine (**1a-c**) and lysergine (**2a-e**) subclasses of ergot alkaloids (Figure). In this poster, I will be discussing an unprecedented highly diastereoselective intramolecular Heck cyclization of an enantioenriched α,β-unsaturated ester to set vicinal stereocenters required for these ergot alkaloids.[4b] The advanced intermediate of intramolecular Heck cyclization has been achieved via a catalytic enantioselective α-aminoxylation of aldehyde using L-proline as catalyst.[5]

References and Notes:

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3. (a) Bhunia, S.; Ghosh, S.; Dey, D.; Bisai, A. *Org. Lett.* **2013**, *15*, 2426. (b) Chaudhuri, S.; Ghosh, S.; Bhunia, S.; Bisai, A. *Chem. Commun.* **2018**, *54*, 940.
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5. (a) Bhunia, S.; Chaudhuri, S.; De, S.; Babu, K. N.; Bisai, A. *Org. Biomol. Chem.* **2018**, *16*, 2427. (b) Shaw, K.; Das, M. K.; Bisai, A. *Manuscript under preparation*. ([ζ]both authors contributed equally)