Ph.D. Open Seminar

Title of Thesis: **"Total Syntheses of Icetaxane Diterpenoids via Benzo-heptannulation Strategy"**

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Date: **October 11, 2017** Time: **4:30 PM** Venue: **AB2-401**

Abstract

Nor-icetaxane (**1**), icetaxane diterpenoids (**2a-e**) and hydrangenone **3** have been isolated from a variety of terrestrial plant sources.[1] Reportedly, few members of icetexanes exhibit an array of interesting biological properties, such as hypotensive activity, cytotoxicity against P388 murine leukemia cells, anthelmintic and antileishmanial activities.[1] Because of their powerful biological activities of several congeners of icetaxane family, these diterpenoids have long attracted the interests of synthetic chemists.[1]

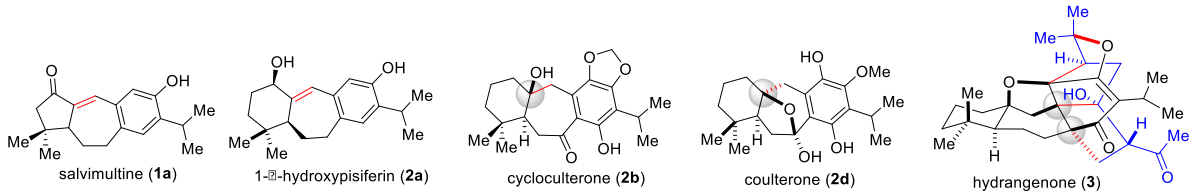
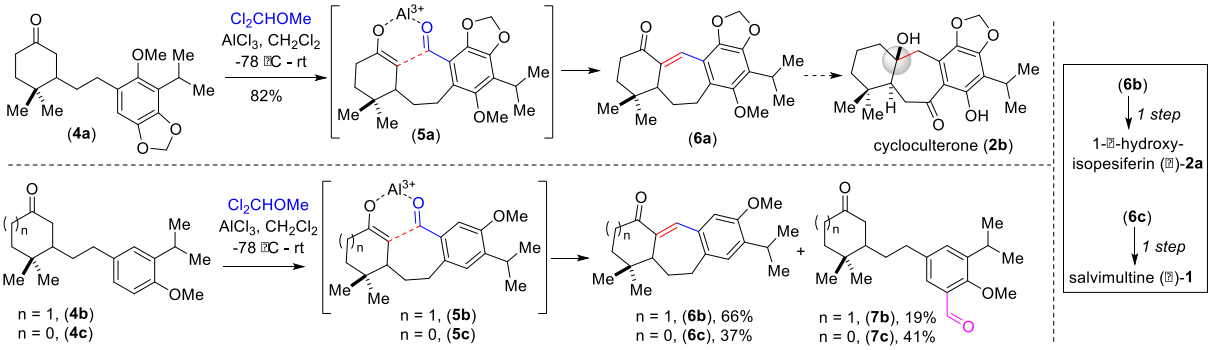


Figure 1.. Selected nor-icetaxane (**1**) and icetexane (**2a-e**) diterpenoid **3**.

Although few approaches to the total syntheses of this class of terpenoids have been reported,[1b] however, majority of them are in racemic form. As a part of my Ph.D. thesis, I undertook the development of unified strategy for the asymmetric total syntheses of icetaxane diterpenoids (Figure 1). We envisioned that 5/7/6-not-icetaxane core **1**, 6/7/6-icetaxane core **2a-d**, and the core structure of hydrangenone **3** can be accessed from an enantioenriched tricycle **6** (Scheme 1), which in turn could be synthesized from enantiopure 3-substituted cycloalkalone of type **4**.[2, 3] I will discuss about the benzo-heptanulation as unified strategy for core structures of nor-icetaxane (**1**), icetaxane diterpenoids (**2a-e**).[4]



Scheme 1. Key formylation followed by aldol condensation.

References and Notes:

1. (a) Ulubelen, A.;Topcu, G. *J. Nat. Prod.* **2000**, *63,* 879. (b) Simmons; E.M.; and Sarpong, R.; *Nat. Prod. Rep.* **2009**, *26,* 1195. (c) Farimani, M. M.; Taheri, S.; Ebrahim, S. N.; Bahadori, M. B.; Khavasi, H. R.; Zimmermann, S.; Brun, R.; Hamburger, M. *Org. Lett.* **2012**, *14*, 166.
2. Approach to diterpenoids, see; (a) Kakde, B. N.; Parida, A.; Kumari, P.; Bisai, A. *Tetrahedron Lett.* **2016**, *57*, 3179. (b) Kakde, B. N.; Parida, A.; Kumar, N.; Bisai, A. *ChemsirtySelect* **2016**, *1*, 3357. (c) Chaudhuri, S.; Parida, A.; Ghosh, S.; Bisai, A. *Synlett* **2016**, *27*, 215. (d) Kinthada, L. K.; Medisetty, S. R.; Parida, A.; Babu, K. N.; Bisai, A. *J. Org. Chem.* **2017**, *82*, DOI: 10.1021/acs.joc.7b01232.
3. (a) Parida, A.; Sharique, M.; Kakde, B.N.; Ghosh, S.; Bisai, A. *Synthesis* **2015**, *47*, 2965. (b) Parida, A.; Nair, V. N.; Das, M. K.; Ghosh, S.; Bisai, A.; *Manuscript under preparation.*
4. Total synthesis of salvimultine (**1a**); Parida, A.; Nair, V. N.; Das, M. K.; Bisai, A.; *Manuscript under preparation.*