

Ph.D. Open Seminar
Department of Chemistry, IISER Bhopal

Title: "Total Syntheses of Natural Products Sharing *abeo*-Abietane Diterpenoid and Merosessquiterpene via a Key Friedel-Crafts Alkylations"

Speaker: **Mr. Badrinath N. Kakde**

Date: **June 23, 2015**

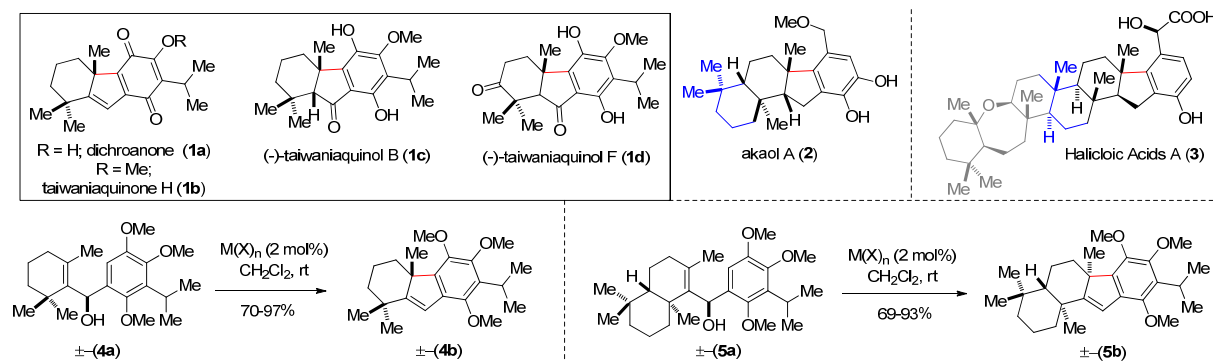
Time: **4:00 PM**

Roll No.: **1010203**

Venue: **L-4, LHC**

Abstract

The *abeo*-abietanes (**1a-d**), sharing an unusual [6,5,6]-tricyclic frameworks with an all-carbon quaternary stereocenters¹ (Scheme), are a family of diterpenoid natural products which have been isolated from a variety of sources.² Studies of the biological activities of taiwaniaquinoids are ongoing, but preliminary data have indicated that some members of this family exhibit antitumor and aromatase inhibitory activities.² Recently, various merosessquiterpenes [such as akaol A (**2**)] have been isolated from various sources.^{3a} In addition, new merohexaprenoids, halicloic acids A (**3**), have also been isolated from the marine sponge *Haliclona* (*Halichoclona*) sp. collected in the Philippines.^{3b} Because of their unique architecture and interesting biological properties, these terpene based natural products drew attention to the synthetic community.⁴



Scheme. *abeo*-Abietanes (**1a-d**), merosessquiterpene (**2**), and merohexaprenoid (**3**) and our approach to **1** and **2**.

Towards my Ph.D. thesis work, I have developed unified strategy for the synthesis of *abeo*-abietanes (**1a-d**) and merosessquiterpene (**2**) natural products via an efficient Friedel-Crafts alkylations (Scheme).⁵ The key step involves a Lewis acid-catalyzed cyclization of arylvinylcarbinols, which installed an all-carbon quaternary stereocenter at the pseudobenzyl position required for these terpenoids (Scheme). Using aforementioned strategy we have completed total syntheses of various *abeo*-abietanes (**1a-c**), including first total synthesis of taiwaniaquinol F (**1d**)⁶ and various structural motif of merosessquiterpene (**2**).⁷

References and Notes:

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3. (a) Blunt, J. W.; Copp, B. R.; Munro, M. H. G.; Northcote, P. T.; Prinsep, M. R. *Nat. Prod. Rep.* **2005**, *22*, 15. (b) Williams, D. E.; Steino, A.; Voogd N. J.; Mouk A. G.; Andersen R. J.; *J. Nat. Prod.* **2012**, *75*, 145.
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5. (a) Kakde B. N.; Bhunia, S.; Bisai A. *Tetrahedron Lett.* **2013**, *54*, 1436. (b) Kakde B. N.; De. S.; Dey D.; Bisai A.; *RSC Advances.* **2013**, *3*, 8176.
6. (a) Kakde B. N.; Kumari, P.; Bisai A. *Manuscript Submitted*. (b) Kakde B. N.; Kumari, P.; Mourya, A.; Bisai A. *Manuscript under preparation*.
7. Kakde B. N.; Kumar, N.; Bisai A. *Manuscript Submitted*.