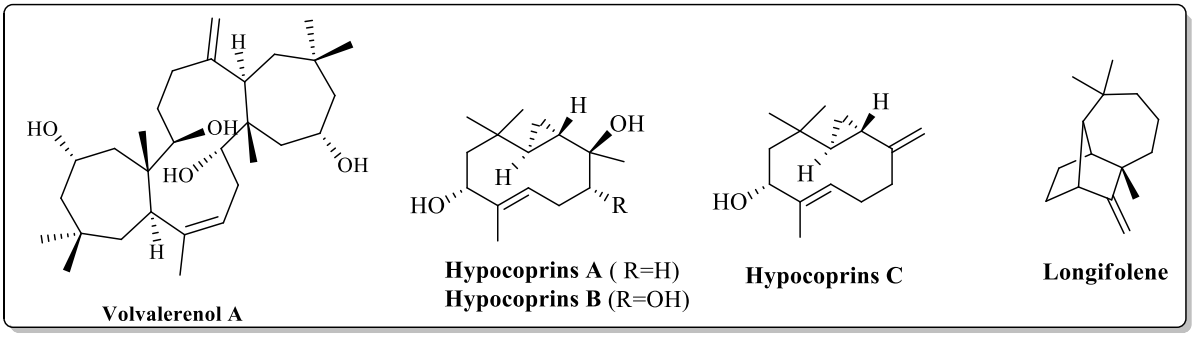
# *Abstract*

**Thesis Title: Synthetic Studies towards naturally occurring terpenes Volvalerenol-A Hypocoprins A-C & Longifolene**

**Abstract:** Natural products have played a significant role in human disease therapy and prevention. With more than 23,000 known compounds, terpenoids are the largest class of natural products. Terpenoids have a wide range of biological activities, including anti-cancer, anti-malaria, anti-inflammation, and anti-infectious disease properties (viral and bacterial). In 2002, the global sales of terpene-based medications were estimated to be around $12 billion. TaxolR, an anticancer medicine, and Artemisinin, an antimalarial treatment, are two of the most well-known terpene-based pharmaceuticals. Due to the broad spectrum of bioactivity and the architecturally complex structure of these molecules synthetic organic chemist community have targeted these molecules for total synthesis and biosynthetic study.

The thesis briefly describes synthetic studies toward the total synthesis of triterpene Volvalerenol A, sesquiterpenes Hypocoprins A-C, and Longifolene. For the synthesis of the said natural products, we have adopted PLE-mediated enzymatic asymmetric desymmetrization reaction to construct quaternary stereocenter, Keck allylation reaction, Reductive cyclopropane ring-opening reaction, Peterson olefination, Olefin ring closing-metathesis, HWE olefination, asymmetric alkyne addition reaction, Noyori reduction, asymmetric Simmons-Smith Cyclopropanation reaction, Schwartz reaction, NHK reaction, Johnson's orthoester rearrangement etc.




*Key Words:* Terpenes and terpenoids, Asymmetric synthesis, Synthetic methods, Total synthesis, Ring-closing metathesis (RCM), Natural products etc.

The thesis entitled **"**Synthetic Studies towards naturally occurring terpenes Volvalerenol-A Hypocoprins A-C & Longifolene**"** consists of four parts. ***Chapter 1*** provides a ***General introduction and synthetic background on Terpene and Terpenoid***, ***Chapter 2*** involves ***Synthetic studies towards Volvalerenol-A, a Unique Tricyclic Triterpenoid through exploitation of Pseudo $C_2$-Symmetry***. ***Chapter 3*** contains ***Synthetic studies towards Hypocoprins A-C.*** Whereas ***Chapter 4*** provides ***Synthetic studies towards Longifolene***.