

18th International Conference on

Pure and Applied Chemistry

August 31- September 01, 2018 | Toronto, Canada

Asymmetric total synthesis of biologically active natural products

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Natural products are a source of diversified compounds with structural arrangements and possess interesting biological activities. Asymmetric syntheses of bioactive compounds are at the forefront of synthetic organic chemistry due to its varied applications particularly in the field of pharmaceuticals. The ultimate goal of organic synthesis is to assemble a given target organic compound from readily available starting materials and reagents in the highly efficient way. Among an array of naturally occurring and biologically important compounds, the trans-3,5-disubstituted piperidinyl fragment and functionalized 10 membered lactones (Cytospolides) occupy a prominent position. They can be utilized in the treatment of insomnia and posses cytotoxic effects to various human carcinoma cell lines. As part of our research on the asymmetric synthesis of bioactive compounds, herein, we wish to report the synthesis of medicinally important piperidine unit of dual orexin receptor antagonist MK-60961 and cytosolic D. The TMS prolinol catalyzed Michael addition, Jacobsen's HKR, Sharpless AD, organo-catalysed cross aldol and Grubb's catalyzed RCM reactions were employed as the source of chirality.

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