ORGANIC SEMINAR

The Synthesis of γ-butyrolactone and γ-butenolide Signaling Molecules from Streptomyces Species.

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Abstract: *Streptomyces* are a fruitful source of natural products (NPs) with important biological activities; however, the discovery of novel NPs from the genus came to a halt until bioinformatics revealed a bounty of silent, or unexpressed, biosynthetic gene clusters (BGCs). One of the ways these BGCs are regulated is through repressors which bind functionalized γ-butyrolactone or γ-butenolide signaling molecules. By leveraging these pathways, novel NPs can be accessed. However, since these molecules are isolated in sub-nanomolar concentrations from their respective species and are challenging to access synthetically due to the dense substitution patterns and numerous stereocenters, their relationship with the repressors is understudied. Discussed herein are the synthetic efforts towards four classes of signaling molecules: A-Factor, the *Streptomyces coelicolor* butanolides (SCBs), and the *Streptomyces ansochromogenes* and *rochei* butenolides (SABs/SRBs, respectively). Through accessing common core scaffolds, a library of enantio-pure compounds has been synthesized through chemical and biocatalytic techniques.

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