

Structure and Function of Terfestatin Biosynthesis Proteins TerB and TerC.

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Abstract:

Terfestatins are a recently discovered class of small molecule natural product containing a ter-phenyl backbone, the center ring of which is decorated with alcohols and a sugar. Terfestatin A, the first such chemical discovered, has auxin signaling activity in plants. Terfestatins B and C, discovered later by the Thorson lab in *Streptomyces*, have neuroprotective properties. Understanding the biosynthetic pathway involved in synthesizing these molecules may yield insights into novel organic chemistry and improved chemical synthesis preparations, as well as provide avenues for microbial-driven medicinal chemistry toolboxes. One particular step in the synthesis of terfestatins involves dehydration and reduction of polyporic acid to a tri-alcohol, which then serves as the terphestatin backbone. Two enzymes, TerB and TerC, work together to perform this reaction. In this work, we investigate the reaction via biochemistry and x-ray crystallography and propose two possible mechanisms in which either TerB and TerC or TerB alone participate.

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