

Biosynthesis of the antitumor agent chartreusin involves the oxidative rearrangement of an anthracyclic polyketide.

Xu Z, Jakobi K, Welzel K, Hertweck C (2005) Biosynthesis of the antitumor agent chartreusin involves the oxidative rearrangement of an anthracyclic polyketide. *Chem Biol* 12(5), 579-588.

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Abstract

Chartreusin is a potent antitumor agent with a mixed polyketide-carbohydrate structure produced by *Streptomyces chartreusis*. Three type II polyketide synthase (PKS) gene clusters were identified from an *S. chartreusis* HKI-249 genomic cosmid library, one of which encodes chartreusin (*cha*) biosynthesis, as confirmed by heterologous expression of the entire *cha* gene cluster in *Streptomyces albus*. Molecular analysis of the approximately 37 kb locus and structure elucidation of a linear pathway intermediate from an engineered mutant reveal that the unusual bis-lactone aglycone chartarin is derived from an anthracycline-type polyketide. A revised biosynthetic model involving an oxidative rearrangement is presented.

Beteiligte Forschungseinheiten

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