A Bioinspired but Non-Biomimetic Synthesis of Lignans Enabled by Radical Cation Intermediate

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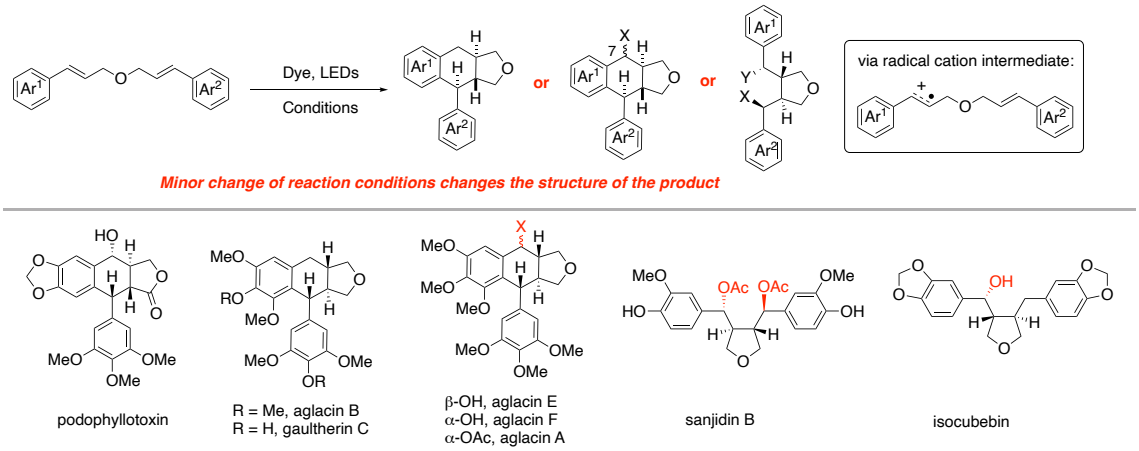
Lignans, displaying broad structural diversity and varying oxidation levels, are widely distributed in the plant kingdom. They possess significant pharmacological properties including anticancer, antimicrobial, anti-inflammatory, antiviral, immunosuppressive, cardiovascular and antioxidant activities.[1] Etoposide, an anticancer drug prepared from podophyllotoxin (which is isolated from the rhizome of podophyllum), is on the WHO's list of essential medicines.[2] Despite considerable progress in synthesizing this family of natural products, a sustainable, general and cost-effective chemical synthesis is still highly sought after in order to fully exploit their potential. We will present our divergent synthesis of aryltetralin cyclic ethers, dibenzyltetrahydrofurans and aryltetrahydronaphthalene lignans from dicinnamyl ethers under photoredox catalytic conditions.[3]



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