

Recent progress in chemoenzymatic synthesis of natural and unnatural products: Amaryllidaceae and morphine alkaloids, opiate-derived pharmaceutical agents, and other targets of interest.

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Abstract:

This lecture will provide an update on our efforts aimed at the synthesis of morphinans and their derivatives of commercial value. The academic efforts originate with the enzymatic dihydroxylation of aromatic substrates and aim at efficient syntheses of morphine and congeners. The industrial process development relies on transition metal-catalyzed oxidative demethylation of thebaine and oripavine and further conversion to naltrexone, naloxone, and other agents. N-Demethylation of morphine alkaloids by fungal cytochromes is also being studied and compared with chemical processes for overall efficiency. In the Amaryllidaceae alkaloids area new derivatives of pancratistatin and narciclasine are being synthesized and evaluated for activity in several cancer cell lines. Other targets of interest include the synthesis of highly oxygenated compounds from the *ipso*-diol derived enzymatically from benzoic acids.