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The development of novel bio-catalytic strategies to construct enantiomerically pure sulfoxides

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PURPOSE OF THE ABSTRACT

Flavoenzymes have the potency to catalyse a vast number of monooxygenation reactions owing to the chemical versatility of cofactor flavin.[1] In BVMO-catalysed oxidation reactions, one atom of molecular oxygen is introduced to the organic substrate, and the other oxygen atom undergoes reduction to water. Having water as a by-product, BVMO attracts interest to be explored as a synthetic tool to address green chemistry.

This enzyme has not only been used for performing Baeyer-Villiger oxidations[2] but also for other oxidation reactions including sulfoxidations, oxidations of boron and selenium-containing compounds, epoxidations, and N-oxidations.[3] Chemo- and stereo-selectivity are the major focus of previous studies. Only a few works conducted on substrates presented more than one group susceptible to BVMO-catalysed oxidation.[4,5]

This work aims to set up a biocatalytic methodology for constructing enantiopure sulfoxides bearing multiple oxidative sites. A series of sulfides were synthesised using standard synthetic techniques as substrates and screened by a panel of BVMO enzymes. Selected enzymes were investigated and used for the methodology development.

FIGURES

FIGURE 1

FIGURE 2

KEYWORDS

BVMO | Sulfoxide

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