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ENANTIOSELECTIVE SYNTHESIS OF BETA-HYDROXYSULFIDES USING KETOREDUCTASES

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PURPOSE OF THE ABSTRACT
Chiral sulfur compounds are an important class of chemicals which find applications across multiple industries. Enantiomerically pure sulfur compounds are key structural motifs in organic chemistry, in pharmaceutical ingredients as well as in natural compounds responsible for the aroma and flavours of many foods and beverages. Due to the importance of sulfur motifs in organic chemistry and in the food and pharmaceutical industries, there is a lot of focus on efficient approaches to their synthesis [1].

The number of chemical reactions catalysed by enzymes has increased exponentially over the last century [2]. Biocatalysis offers sustainable and cost-effective methods for the synthesis of chemicals and drugs and provides advantages over traditional chemo-catalytic methods. We recently reported the synthesis of enantiomerically pure chiral beta-hydroxysulfoxide compounds bearing a stereocentre at the C-O bond using ketoreductase enzymes [3-4]. Moreover, we have also reported the enantioselective synthesis of beta-hydroxysulfoxides bearing a stereocentre at the C-S bond [3]. Namely, two ketoreductases catalysed the enantioselective synthesis of the latter compounds with opposite enantioselectivites by dynamic kinetic resolution (DKR) of racemic alpha-thioaldehydes [3].

FIGURES

FIGURE 1

FIGURE 2

KEYWORDS

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