

N°1301 / PC

TOPIC(s) : Biocatalytic cascade reactions

## Enzymatic synthesis of hydroxysulfides by ketoreductases

### AUTHORS

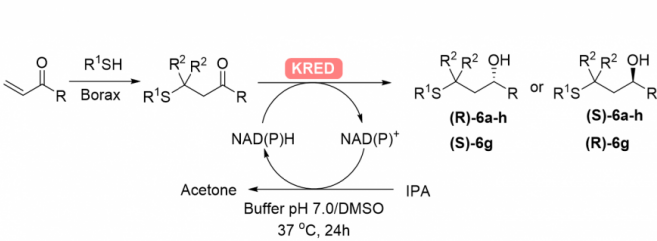
Chuhan LI / UNIVERSITY COLLEGE LONDON, 20 GORDON ST, LONDON

Corresponding author : Daniele CASTAGNOLO / d.castagnolo@ucl.ac.uk

### PURPOSE OF THE ABSTRACT

Chiral hydroxysulfides are an important class of organic compounds which find broad application in organic and pharmaceutical chemistry. Herein we describe the development of novel biocatalytic methods for the enantioselective synthesis of hydroxysulfides by exploiting ketoreductase (KRED) enzymes. Two KREDs were discovered from a pool of 384 enzymes identified and isolated through a metagenomic approach. KRED311 and KRED349 catalysed the synthesis of hydroxysulfides bearing a stereocentre at the C-O bond with opposite absolute configurations and excellent ee values by novel biocatalytic reactions starting from commercially available thiophenols/thiols and vinylketones. Thiocarboxylic acids were also synthesised using nitrilase enzymes.

FIGURES



Scheme 2. Biocatalytic synthesis of hydroxysulfides

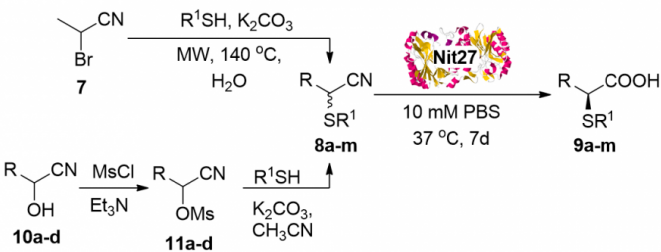


Table 2. Biocatalytic synthesis of thiocarboxylic acids with Nit27

FIGURE 1

Biocatalytic synthesis of hydroxysulfides  
Biocatalytic synthesis of hydroxysulfides

FIGURE 2

Biocatalytic synthesis of thiocarboxylic acids  
Biocatalytic synthesis of thiocarboxylic acids with Nit27

KEYWORDS

Chemoenzymatic Cascades | ketoreductase | hydroxysulfides | biocatalytic

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