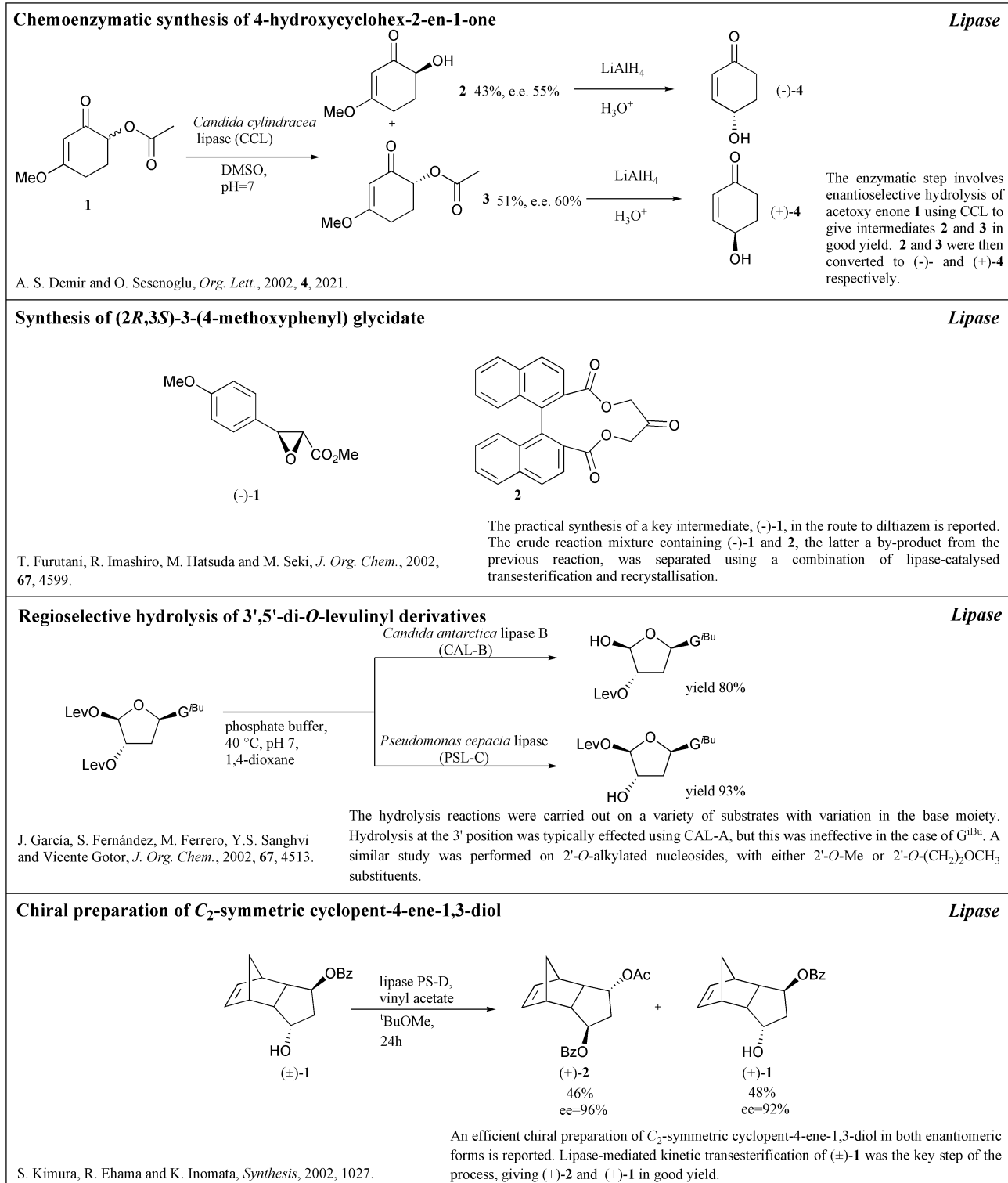


Gideon Grogan,^a Selena Guilly,^b Ian Jackson,^b Denise McIntyre,^b Reuben Carr,^b Sabine Flitsch^b and Nicholas Turner^b

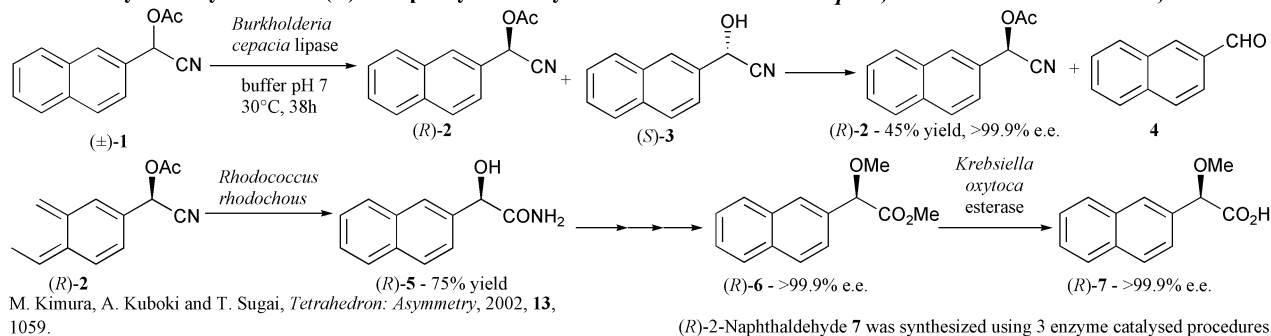
^a Department of Chemistry, University of York, Heslington, York, UK YO10 5DD

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Perkin 1 Abstracts: Biocatalysis in Organic Synthesis aims to cover recent literature concerning the applications of enzymes and micro-organisms as catalysts in organic synthesis. The abstracts will emphasise the key synthetic step(s) that are mediated by the biocatalyst. Emerging technologies for biocatalyst design and optimisation will also be included.

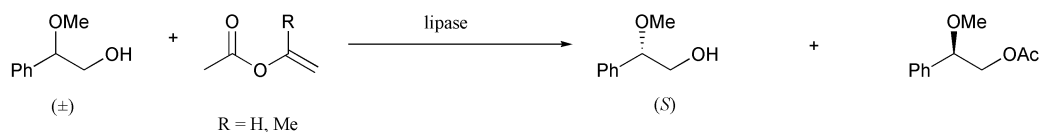


Chemo-enzymatic synthesis of (*R*)-2-naphthylmethoxyacetic acid



Enzymatic resolution of 2-methoxy-2-phenylethanol

Lipase

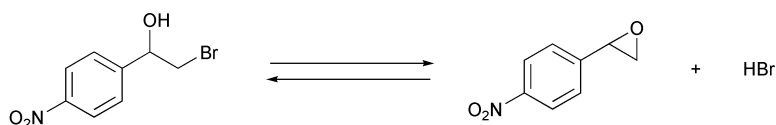


M. I. Monterde, R. Brieva, V. M. Sánchez, M. Bayod and V. Gotor, *Tetrahedron: Asymmetry*, 2002, **13**, 1091.

Several lipase-catalysed processes were evaluated for the resolution of 2-methoxy-2-phenylethanol, a chiral auxiliary in the synthesis of optically active 1,4-dihydropyridines. *Candida antarctica* lipase B (CAL B) catalyses the enzymatic acylation of the primary alcohol with high enantioselectivity.

Studies in halohydrin dehalogenase using chromogenic substrates

Dehalogenase

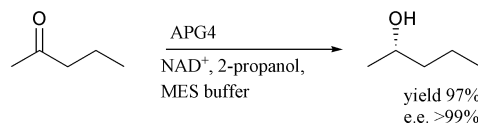


J. H. Lutje Spelberg, L. Tang, M. van Gelder, R. M. Kellogg and D. B. Janssen, *Tetrahedron: Asymmetry*, 2002, **13**, 1083.

The enantioselectivity of ring closure reactions catalysed by three different halohydrin dehalogenase could be estimated by using a spectrophotometric assay. The ring-opening reactions catalysed by halohydrin dehalogenase from *Agrobacterium radiobacter* AD1 showed that in addition to Cl⁻ and Br⁻, other nucleophiles (N₃⁻, CN⁻ and NO₂⁻) are also accepted for the ring opening of *para*-nitrostyrene oxide.

Asymmetric reduction of aliphatic ketones

Fungus

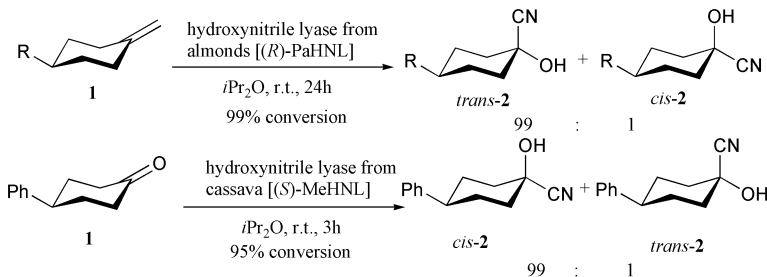


T. Matsuda, Y. Nakajima, T. Harada and K. Nakamura, *Tetrahedron: Asymmetry*, 2002, **13**, 971.

APG4 is the dried cells of *Geotrichum candidum* IFO 4597. Using NADP⁺ instead of NAD⁺ had no effect on yield or enantioselectivity. The yield was found to increase on increasing the amount of propan-2-ol from 100 μL per 10 μL of ketone to 500 μL. A total of 7 aliphatic ketones were reduced in a similar fashion, yields ranging from 34-97% and e.e.'s from 93-99%.

cis-trans Selectivity of enzyme-catalysed additions to 4-substituted cyclohexanones

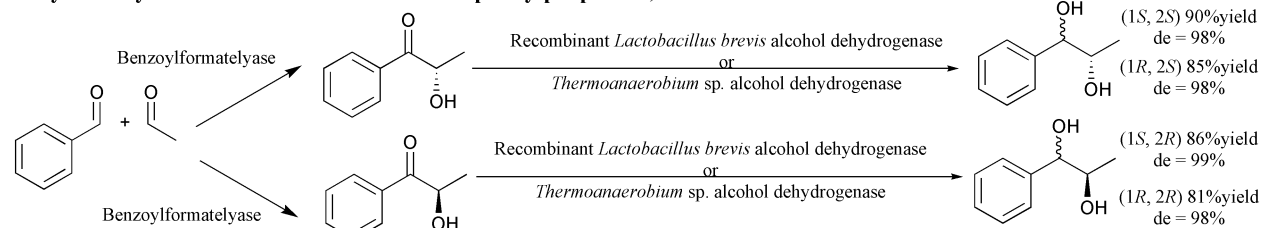
Lyase



F. Effenberger, J. Roos and C. Kobler, *Angew. Chem., Int. Ed.*, 2002, **41**, 1876.

cis-Selectivity of MeHNL was explained using X-ray crystal structures, however too little is known about the structure of PaHNL to explain the *trans*-selectivity of this enzyme.

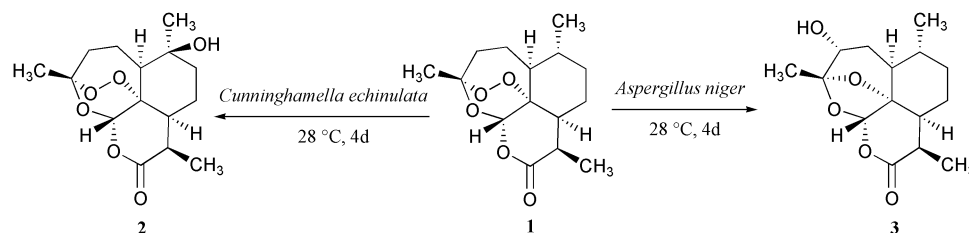
Enzymatic synthesis of all stereoisomers of 1-phenylpropane-1,2-diol



D. Kihumbu, T. Stillger, W. Hummel and A. Liese, *Tetrahedron: Asymmetry*, 2002, **13**, 1069.

A stereoselective two-step enzymatic synthesis of all four stereoisomers of 1-phenylpropane-1,2-diol starting from benzaldehyde and acetaldehyde is described. By using one of four possible combinations of a lyase followed by an alcohol dehydrogenase, each diol is accessible separately.

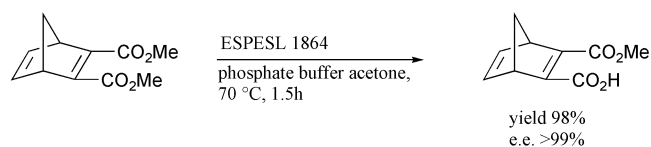
Microbial transformations of artemisinin



J. Zhan, H. Guo, J. Dai, Y. Zhang and D. Guo, *Tetrahedron Lett.*, 2002, **43**, 4519.

10β-Hydroxyartemisinin **2** is a new compound.

Desymmetrization of dialkyl bicyclo[2.2.1]hept-2,5-diene-2,3-dicarboxylates



Y. Kashima, J. Liu, S. Takenami and S. Niwayama, *Tetrahedron: Asymmetry*, 2002, **13**, 953.

Ethyl and propyl diesters were also desymmetrised using the thermophilic esterase ESPEL 1864. Conducting the monohydrolysis at 37 °C, the reaction required a much longer time and e.e.'s were reduced.

Thermophilic esterase/Lipase