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Supplementary Information

Enantioselective Resolution of (*R,S*)-1-Phenylethanol Catalyzed by Lipases Immobilized in Starch Films

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Characterization by optical microscopy of grains extracted from ginger starch

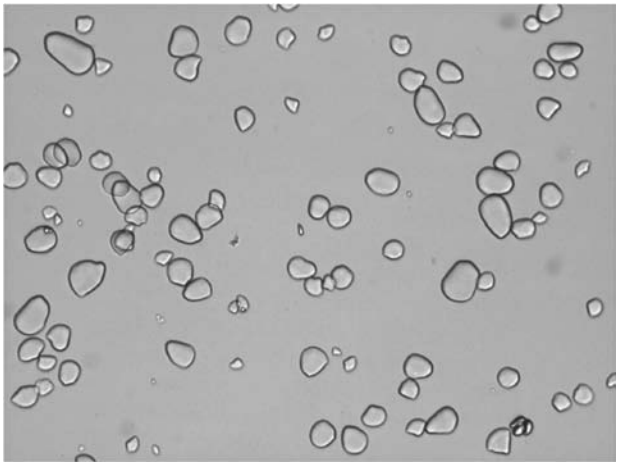
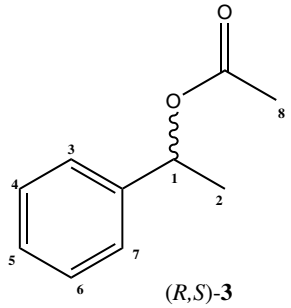


Figure S1. Micrograph of ginger starch grains (*Zingiber officinale*), magnification of 200 ×. No scale given.

*Chemical synthesis of racemic (R,S)-1-phenylethyl acetate (**3**)*



(*R,S*)-**3**

The racemic *(R,S)*-1-phenylethyl acetate was prepared by chemical acetylation of the precursor alcohol (*R,S*)-**1** (4.9 mL, 4.1 mmol) employing acetic anhydride (19.4 mL, 20.5 mmol) in dichloromethane (30 mL) and acetic acid as the catalyst, as described in the literature.[1] A yellow oil was obtained in 70% yield after purification by columm chromatography on silica gel using a mixture of *n*-hexane and ethyl acetate (9:1 v:v) as the eluent. This compound was used as a standard in the chiral gas chromatography analysis and was analyzed by ^{1}H NMR, IR, chiral GC and specific rotation. ^{1}H NMR ($CDCl_3$, 400 MHz) δ 7.23 (m, 5H), 5.82 (q, 1H, *J* 6.8), 2.10 (s, 3H), 1.50 (d, 3H, *J* 6.8 Hz); IR (KBr) ν_{max}/cm^{-1}: 3064-2872, 1734, 1242; chiral GC t_R/min: 5.0 and 5.4; $[\alpha]_D$ 0.00 (2.56×10^{-2} $CHCl_3$).

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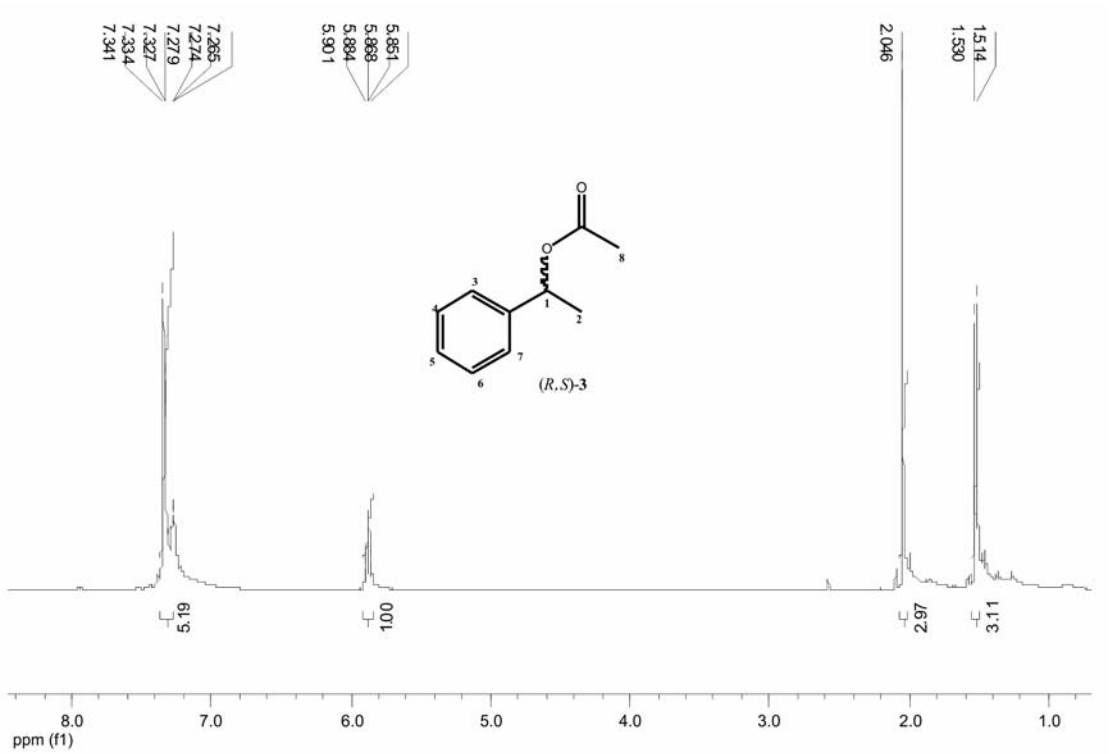


Figure S2. ^{1}H NMR spectrum of (*R*,*S*)-**3** ($CDCl_3$, 400 MHz).

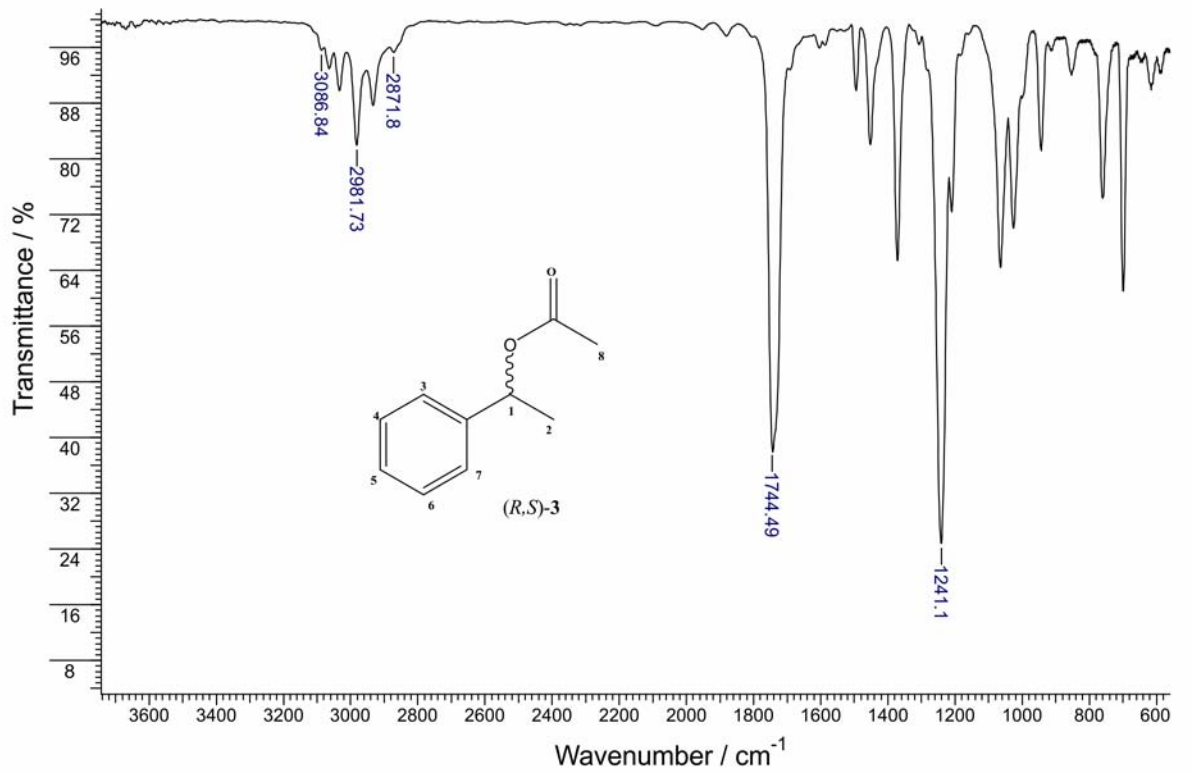


Figure S3. IR spectrum of compound (*R*,*S*)-**3** (film).

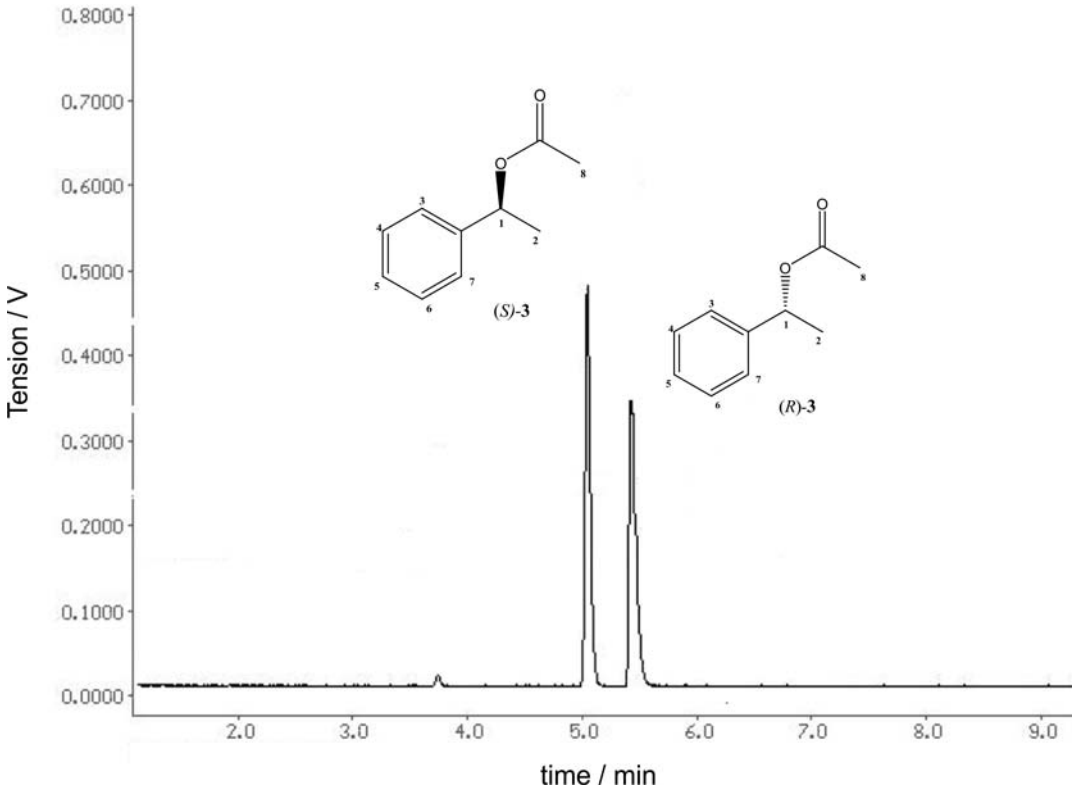


Figure S4. Chromatogram of the racemic mixture of (*R,S*)-**3**:(*S*)-**3** t_R 5.0 and (*R*)-**3** t_R 5.4 min.

*Enzymatic resolution of (R,S)-**1***

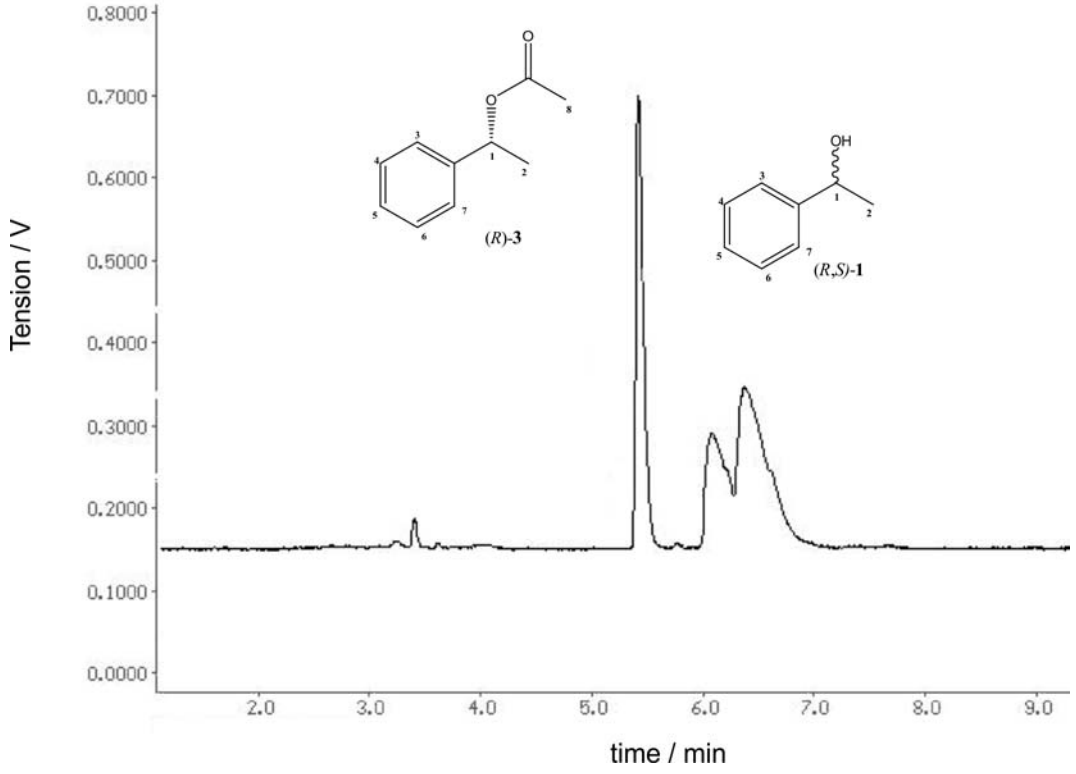
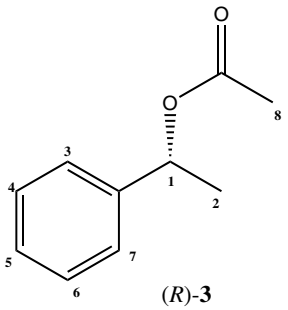


Figure S5. Chromatogram of (*R,S*)-1-phenylethanol resolution catalyzed by LBC immobilized in ginger starch film. (*R*)-**3** t_R 5.4 min. (*R*)-**1** t_R 5.8 min, (*S*)-**1** t_R 6.1 min.

*Spectral data of (R)-1-phenylethyl acetate (**3**)*



(*R*)-**3**

^{1}H NMR ($CDCl_3$, 400 MHz) δ 7.23 (m, 5H), 5.82 (q, 1H, *J* 6.8), 2.10 (s, 3H), 1.50 (d, 3H, *J* 6.8 Hz); IR (KBr) ν_{max}/cm^{-1}: 3064-2872, 1734, 1242; chiral GC t_R/min: 5.4; $[\alpha]_D$ +36 (0.03 $CHCl_3$), $[\alpha]_D$ +43 (2.1 $CHCl_3$).[2]

References

1. Fessender, R. J.; Fessenden, J. S.; *Techniques and Experiments for Organic Chemistry*, PWS Publishers: Boston, 1983, chapter 16, p. 303.
2. Chênevert, R; Pelchat, N; Morin, P; *Tetrahedron: Asymmetry* **2009**, *20*, 1191.