Supporting Information

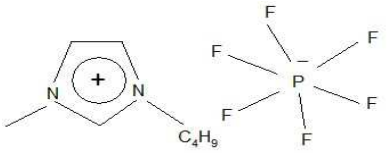
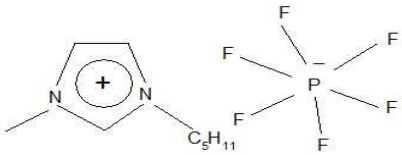
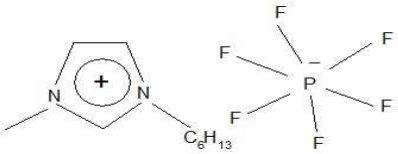
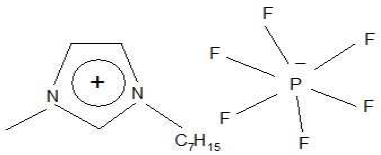
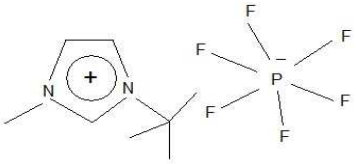
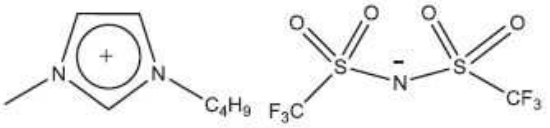
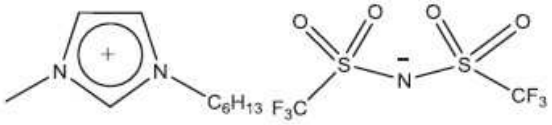
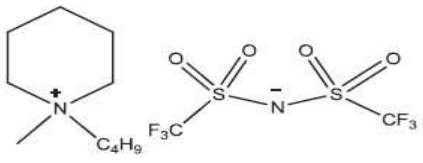
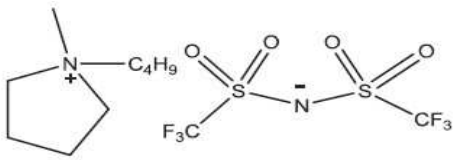
Use of Ionic Liquid to Significantly Improve Asymmetric Reduction of Ethyl Acetoacetate Catalyzed by *Acetobacter sp*. CCTCC M209061 Cells

Xiao-Ting Wang [a], *Dong-Mei Yue* [a], *Min-Hua Zong* [b], *Wen-Yong Lou* [*, a,b]

[a]Laboratory of Applied Biocatalysis, School of Light Industry and Food Sciences, South China University of Technology, Guangzhou 510640, Guangdong, China

[b]State Key Laboratory of Pulp and Paper Engineering, South China University of Technology, Guangzhou 510640, Guangdong, China

Table S1. Water-immiscible ILs used for the biocatalytic reduction of EAA and their abbreviations

Ionic liquid	Structure	Abbreviation
1-butyl-3-methylimidazolium hexafluorophosphate		$C_4mim{\cdot}PF_6$
1-pentyl-3-methylimidazolium hexafluorophosphate		$C_5mim{\cdot}PF_6$
1-hexyl-3-methylimidazolium hexafluorophosphate		$C_6mim{\cdot}PF_6$
1-heptyl-3-methylimidazolium hexafluorophosphate		C_7 $mim{\cdot}PF_6$
1-isobutyl-3-methylimidazolium hexafluorophosphate		iC_4 $mim{\cdot}PF_6$
1-butyl-3-methylimidazolium bis(trifluoromethanesulfonyl)imide		C_4 $mim{\cdot}Tf_2N$
1-hexyl-3-methylimidazolium bis(trifluoromethanesulfonyl)imide		C_6 $mim{\cdot}Tf_2N$
N-butyl-N-methylpiperidinium bis(trifluoromethanesulfonyl)imide		$PP_{14}{\cdot}Tf_2N$
N-butyl-N-methylpyrrolidinium bis(trifluoromethanesulfonyl)imide		$Py_{14}{\cdot}Tf_2N$

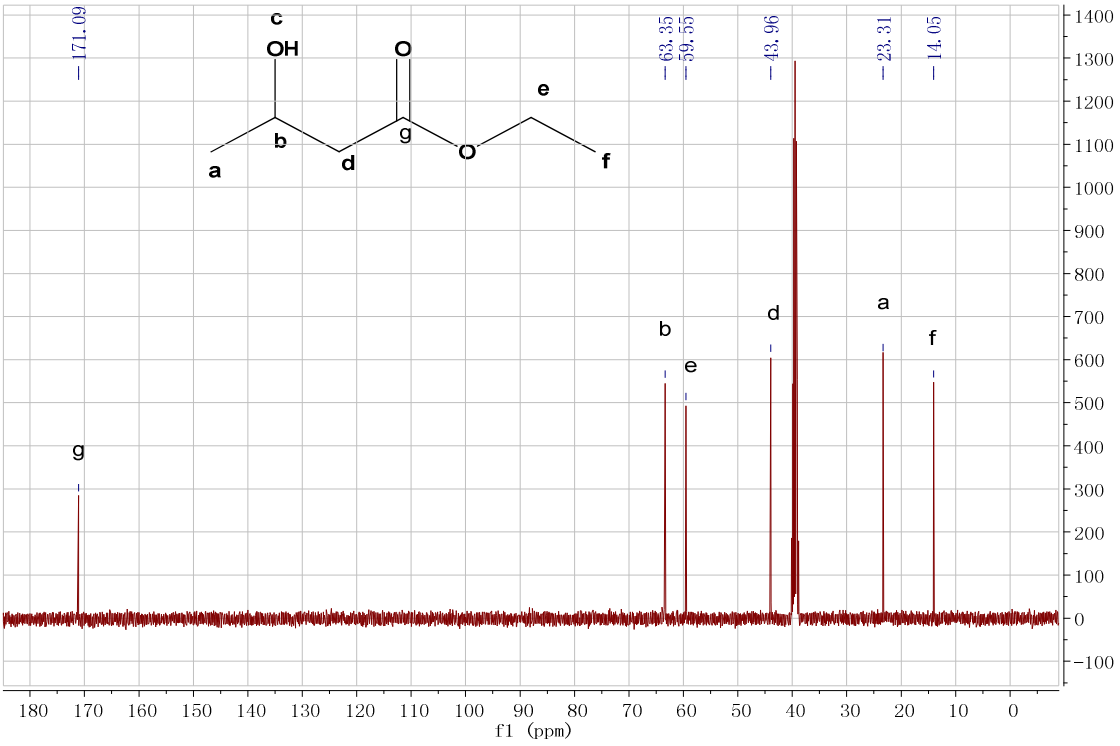


Figure S1. ^{13}C-NMR spectrum of the isolated product EHB in the preparative scale bioreduction. The NMR spectrum of the product was obtained on a Bruker AMX300 NMR Spectrometer (Bruker Co., Germany) operating at 101 MHz for ^{13}C NMR in DMSO. ^{13}C NMR δ 171.09, 63.35, 59.55, 43.96, 23.31, 14.05.

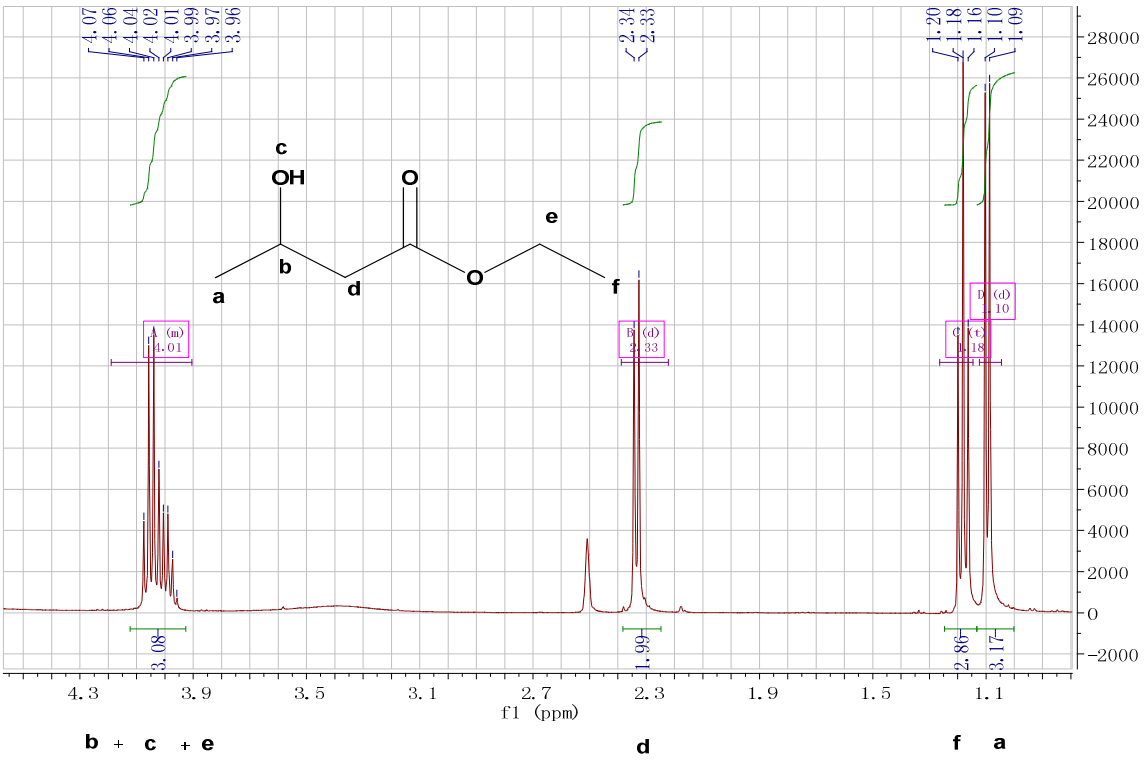


Figure S2. ^{1}H-NMR spectrum of the isolated product EHB in the preparative scale bioreduction. The NMR spectrum of the product was achieved on a Bruker AMX300 NMR Spectrometer (Bruker Co., Germany) operating at 400 MHz for ^{1}H NMR. ^{1}H NMR δ 4.19 – 3.90 (m, 1H), 2.33 (d, J = 6.5, 1H), 1.18 (t, J = 7.1, 1H), 1.10 (d, J = 6.2, 1H).

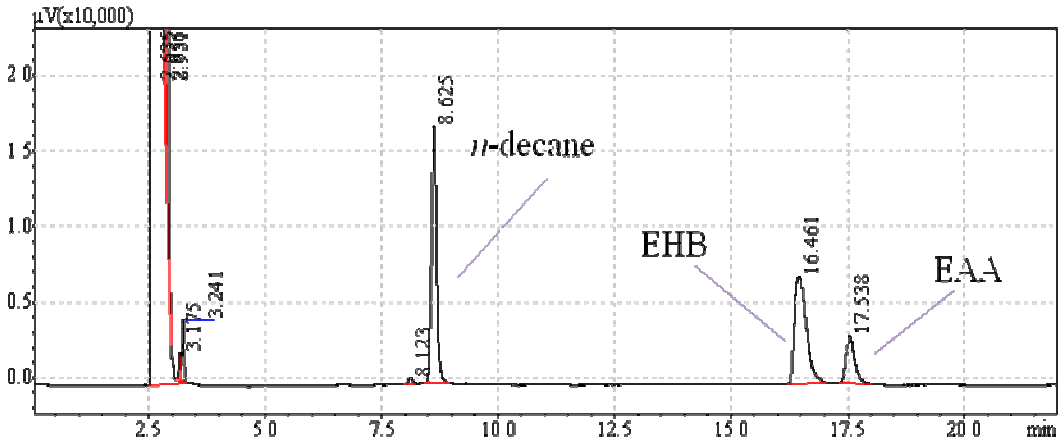


Figure S3. Gas chromatogram of EAA, EHB and *n*-decane (as internal standard). The reaction mixtures were analyzed by a Shimadzu GC2010 model with a flame ionization detector and a HP chiral column (10% permethylated β-cyclodextrin 30 m × 0.25 mm × 0.25 μm) (USA). The split ratio was 50:1. The injector and the detector were both kept at 250 °C. The column temperature was held at 75 °C constant for 20 min. The carrier gas was nitrogen and its flow rate in the column was 2.0 mL/min.

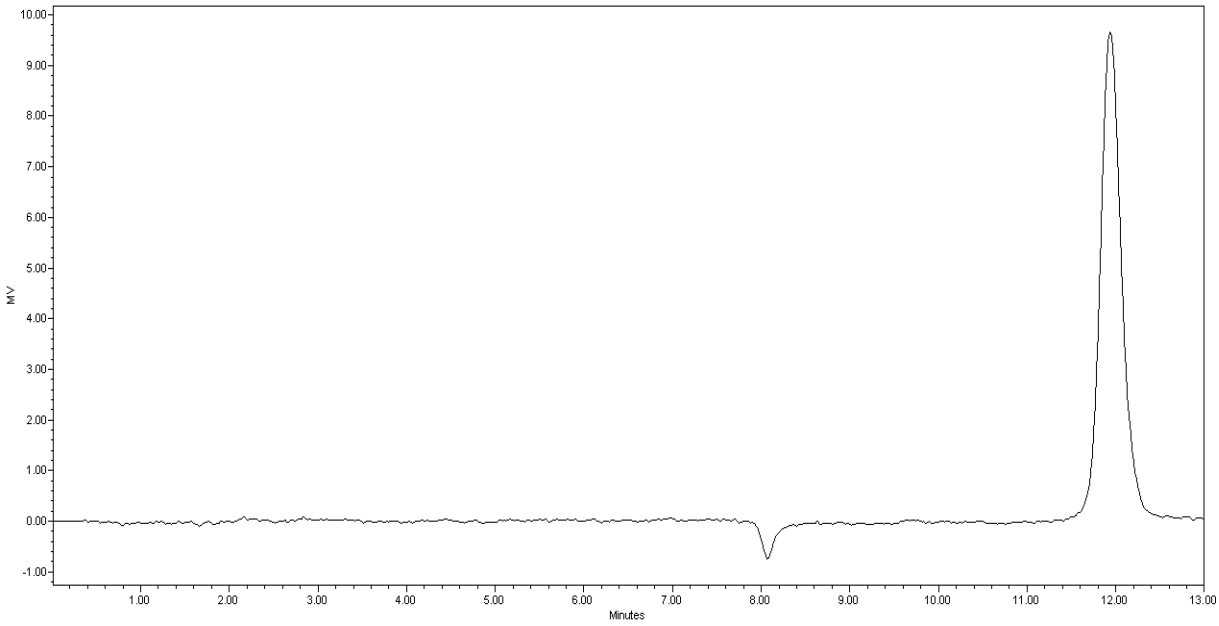


Figure S4. High-performance liquid chromatography (HPLC) of glucose. The glucose concentration was determined by HPLC (515 pump and 2410 differential refraction detector, Waters Cop., USA) using an Aminex HPX-87H column (7.8 mm × 300 mm) under the following conditions: mobile phase, 5.0 mmol/L H_2SO_4; flow rate, 0.5 mL/min; column temperature, 65 °C; detector temperature, 50 °C.