

## Lipase catalyzed synthesis of 3, 3' - (arylmethylene) bis (2-hydroxynaphthalene - 1, 4 - dione)

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### Supporting Information

#### 1 Materials

Porcine pancreas lipase (PPL), *Candida antarctica* lipase B (CALB), *Pseudomonas sp.* lipase (PSL), *C. rugosa* lipase (CRL), *Pseudomonas fluorescens* lipase (PFL), Bovine serum albumin (BSA) and 2-hydroxy-1,4-naphthoquinone used in this study were purchased from Sigma (Beijing, China). Lipase from *Candida sp.* 99-125 (CSL) was obtained from Beijing CTA New Century Biotechnology Co., Ltd. (Beijing, China). These enzymes were used after lyophilization for enzymatic reaction without further purification. All the chemical reagents were purchased from J&K Scientific Ltd. (Beijing, China). Commercially available reagents and solvents were used without further purification. NMR spectra were recorded on an Inova 500 (1H, 500 MHz) spectrometer.

#### 2 NMR data of compounds 3a-3g

##### Product 3a:

<sup>1</sup>H NMR (500 MHz, DMSO-d<sub>6</sub>) δ 6.71 (s, 1H), 7.02-7.24 (m, 5H), 7.69 (t, J = 7.5 Hz, 2H), 7.78 (t, J = 7.5 Hz, 2H), 7.90 (d, J = 7.5 Hz, 2H), 7.96 (d, J = 7.5 Hz, 2H), 16.40 (brs, 2H, partly overlap with solvent);

##### Product 3b:

<sup>1</sup>H NMR (500 MHz, DMSO-d<sub>6</sub>) δ 6.70 (s, 1H), 7.21-7.35 (m, 4H), 7.68 (t, J = 7.5 Hz, 2H), 7.75 (t, J = 7.5 Hz, 2H), 7.89 (d, J = 7.5 Hz, 2H), 7.98 (d, J = 7.5 Hz, 2H), 16.14 (brs, 2H, partly overlap with solvent);

##### Product 3c:

<sup>1</sup>H NMR (500 MHz, DMSO-d<sub>6</sub>) δ 2.25 (s, 3H), 6.72 (s, 1H), 6.98 (d, J = 8.5 Hz, 2H), 7.39 (d, J = 8.5 Hz, 2H), 7.69 (t, J = 7.5 Hz, 2H), 7.74 (t, J = 7.5 Hz, 2H), 7.83 (d, J = 7.5 Hz, 2H), 7.98 (d, J = 7.5 Hz, 2H), 16.14 (brs, 2H, partly overlap with solvent);

##### Product 3d:

<sup>1</sup>H NMR (500 MHz, DMSO-d<sub>6</sub>) δ 3.68 (s, 3H), 6.75 (s, 1H), 6.84 (d, J = 8.5 Hz, 2H), 7.14 (d, J = 8.5 Hz, 2H), 7.74 (d, J = 7.5 Hz, 2H), 7.82 (d, J = 7.5 Hz, 2H), 7.90 (d, J =

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7.5 Hz, 2H), 7.99 (d, J = 7.5 Hz, 2H), 16.32 (brs, 2H, partly overlap with solvent);

**Product 3e:**

<sup>1</sup>H NMR (500 MHz, DMSO-d<sub>6</sub>) δ 6.79 (s, 1H), 7.42 (d, J = 8.5 Hz, 2H), 7.70 (t, J = 7.4 Hz, 2H), 7.78 (t, J = 7.4 Hz, 2H), 7.90 (d, J = 7.5 Hz, 2H), 7.98 (d, J = 7.6 Hz, 2H), 8.05 (d, J = 8.5 Hz, 2H), 16.25 (brs, 2H, partly overlap with solvent);

**Product 3f:**

<sup>1</sup>H NMR (500 MHz, DMSO): δ 3.63 (s, 3H), 6.55-6.80 (m, 4H), 7.09 (t, J = 8.0 Hz, 1H), 7.68 (t, J = 7.5 Hz, 2H), 7.77 (t, J = 7.5 Hz, 2H), 7.89 (d, J = 7.5 Hz, 2H), 7.97 (d, J = 7.5 Hz, 2H), 16.37 (brs, 2H, partly overlap with solvent);

**Product 3g:**

<sup>1</sup>H NMR (500 MHz, DMSO): δ 6.68 (s, 1H), 7.01-7.25 (m, 4H), 7.68 (m, 2H), 7.77 (t, J = 7.5 Hz, 2H), 7.89 (d, J = 7.5 Hz, 2H), 7.97 (d, J = 7.5 Hz, 2H), 16.35 (brs, 2H, partly overlap with solvent).