Supporting Information

Direct biotransformation of nonanoic acid and its esters to azelaic acid by whole cell biocatalyst of Candida tropicalis

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6 Pages, 4 Figures and 1 Table are presented.
Figure S1. Effect of alkane mixture on ENA biotransformation. An alkane mixture was formulated with the equal mass concentration of nonane, decane, undecane and dodecane. Before biotransformation of 1 g/L ENA substrate, the alkane mixture was added at the final concentration of 0.5 g/L (a) and 2.0 g/L (b), respectively. The symbols are denoted as follows: ○, ethyl nonanoate (ENA); ▲, nonanoic acid (NA); □, azelaic acid (AZA).
Figure S2. Biotransformation of nonane to AZA by *C. tropicalis* ATCC20962. After 24 h culture of *C. tropicalis* ATCC20962 at pH 6.0 in YPD medium, nonane was added into the culture broth at the final concentration of 0.92 g/L. The symbols are denoted as follows: ○, nonane; ▲, nonanoic acid (NA); □, azelaic acid (AZA).
**Figure S3. Fed-batch biotransformation of MNA to AZA by *C. tropicalis* ATCC20962.**

After 8 h of batch culture of *C. tropicalis* ATCC20962 in a bioreactor containing YPD medium at pH 6.0, pure nonane was added into the bioreactor at the final concentration of 0.2 g/L (dotted line). After 2 h incubation, the biotransformation was initiated by intermittent addition of pure MNA in order to increase its concentration under 1.0 g/L (solid line). The concentrated glucose solution (500 g/L) was fed continuously at a flow rate of 1.08 g/L-h. The pH of the reaction solution was maintained at pH 7.8±0.2 throughout the biotransformation. The symbols are denoted as follows: ●, dry cell weight; ▲, nonanoic acid (NA); ○, methyl nonanoate (MNA); □, azelaic acid (AZA); x, pH.
**Figure S4. Fed-batch biotransformation of NA to AZA by C. tropicalis ATCC20962 without the glucose feeding.** After 8 h of batch culture in a bioreactor containing YPD medium at pH 6.0, pure nonane was added into the bioreactor at the final concentration of 0.2 g/L (dotted line). After 2 h incubation, the biotransformation was initiated by addition of pure NA at the final concentration of 0.8 g/L in every 4 h (solid line). The pH of the reaction solution was maintained at pH 7.8 throughout the biotransformation. The symbols are denoted as follows: ●, dry cell weight; ▲, nonanoic acid (NA); □, azelaic acid (AZA); x, pH.
**Table S1. Summarized results of fed-batch biotransformation of ENA to AZ by using different glucose feeding rates.**

<table>
<thead>
<tr>
<th>Glucose feed rate (g/L-h)</th>
<th>ENA (g/L)</th>
<th>AZA Concentration (g/L)</th>
<th>Productivity (g/L-h)</th>
<th>Yield&lt;sup&gt;1)&lt;/sup&gt; (mol/mol)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.16</td>
<td>5.4</td>
<td>4.26</td>
<td>0.10</td>
<td>0.79</td>
</tr>
<tr>
<td>1.08</td>
<td>7.6</td>
<td>6.73</td>
<td>0.14</td>
<td>0.88</td>
</tr>
</tbody>
</table>

<sup>1)</sup>Yield indicates the molar ratio of AZA to ENA and nonane added.