

Electronic supplementary information for

**Efficient synthesis of Ibrutinib chiral intermediate in high  
space-time yield by recombinant *E.coli* co-expressing alcohol  
dehydrogenase and glucose dehydrogenase**

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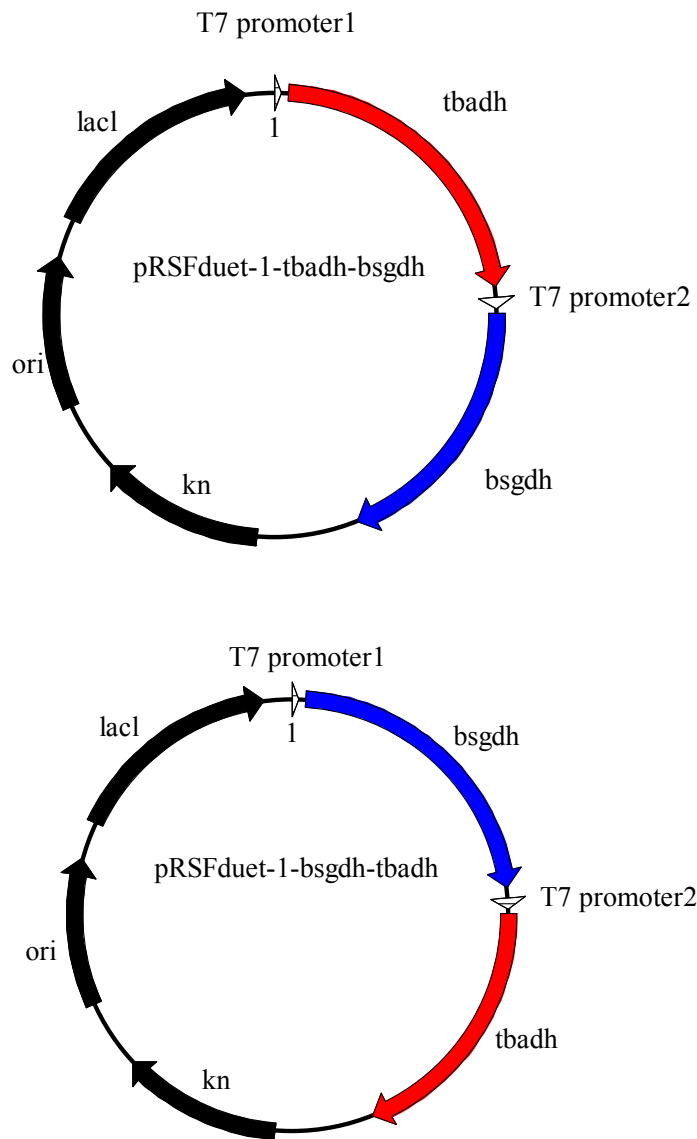
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## Contents:

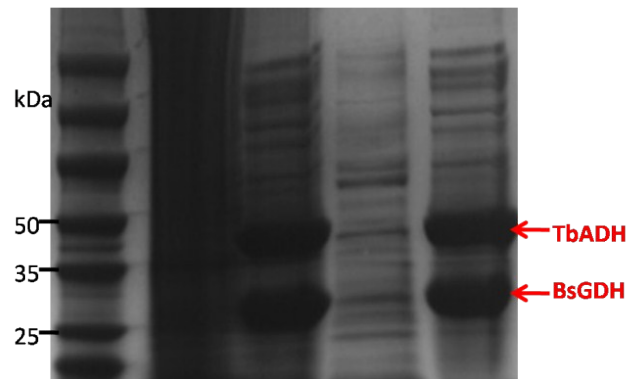
1. **Fig. S1** Two kinds of recombinant plasmids constructed in this study.
2. **Table S1** The enzyme activity of recombinant *E. coli* harboring pRSFduet-1-*tbadh*-*bsgdh* or pRSFduet-1-*bsgdh*-*tbadh*.
3. **Fig. S2** SDS-PAGE analysis for the protein expression of recombinant *E. coli* harboring pRSFduet-1-*bsgdh*-*tbadh*.
4. **Fig. S3** HPLC analysis for the *ee* value of product.
5. **Fig. S4**  $^1\text{H}$  NMR spectra of (*S*)-NBHP.



**Fig.S1** Two kinds of recombinant plasmids constructed in this study.

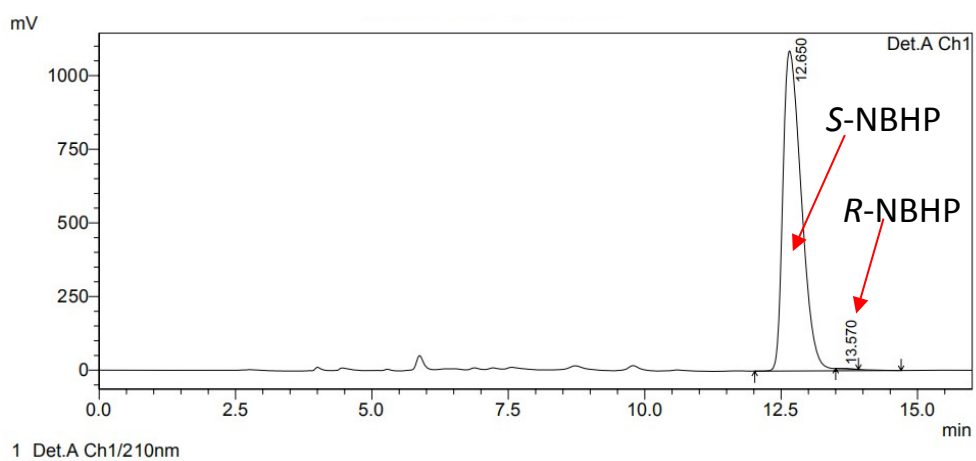
**Table S1** The enzyme activity of these two kinds recombinant *E. coli*

| Catalyst   | Specific activity<br>(U/g) | Activity<br>(U/L) |
|--|----------------------------|-------------------|
| <i>E. coli</i> harboring pRSFduet-1- <i>tbadh</i> - <i>bsgdh</i> | 5.7±0.7                    | 10.9±1.3          |
| <i>E. coli</i> harboring pRSFduet-1- <i>bsgdh</i> - <i>tbadh</i> | 7.9±0.5                    | 12.3±1.3          |

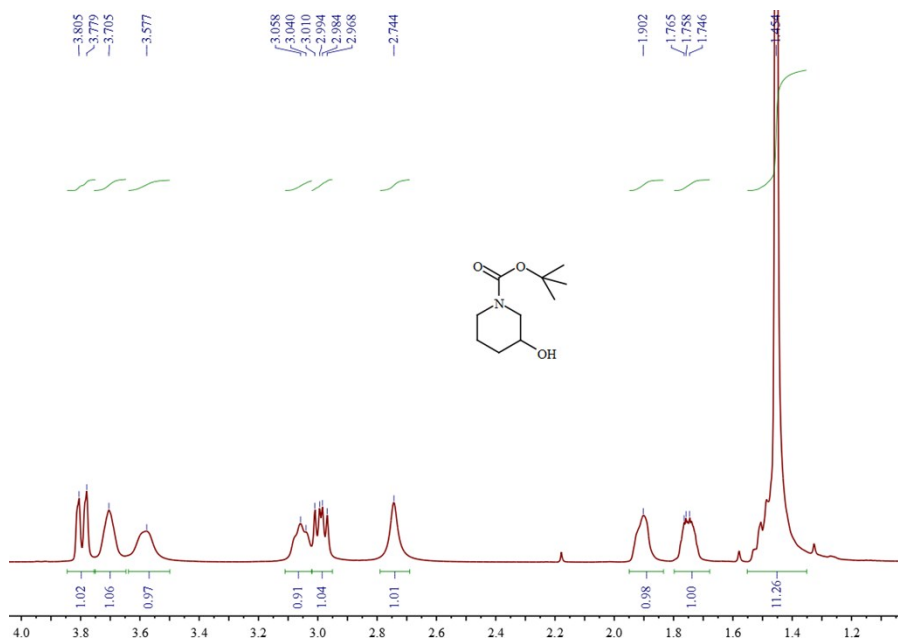


**Fig.S2** SDS-PAGE analysis for the protein expression of recombinant *E. coli* harboring pRSFduet-1-*bsgdh-tbadh*.

The subunit weights of alcohol dehydrogenase and glucose dehydrogenase are approximately 38 and 28 kDa, respectively. Lane 1, molecular weight markers. Lane 2, total proteins from *E. coli* cells with plasmid pRSFduet-1. Lane 3, total proteins from *E. coli* cells with recombinant plasmid. Lane 4, soluble proteins from *E. coli* cells with plasmid pRSFduet-1. Lane 5, soluble proteins from *E. coli* cells with recombinant plasmid.



**Fig.S3** HPLC analysis for the *ee* value of product.



**Fig.S4**  $^1\text{H}$  NMR spectra of (S)-NBHP.