Supplementary Material
Figure 1. Knock out of genes. M.DL2000. M1.DL5000. (A) Target fragment of acrB (1723 bp). (B) Target fragment of yddA (1194 bp). (C) PCR verification of the pKD46 plasmid was transformed into E. coli K-12. M.DL2000 M1.DL5000 Marker, 1. pKD46 (1464 bp). 1-5. Positive clones. (D) Results of positive clones by PCR of \( \Delta yddA \) in E. coli K-12. (E) Results of positive clones by PCR of \( \Delta acrB \) in E. coli K-12. (F) Results of positive clones by PCR of \( \Delta yddA \) in E. coli \( \Delta acrB \). (F) Growth curve of the recombinant. Take each time point of liquid measuring OD value of 600 nm, draw the growth curve of these strains.

Fig 2. Cloning of yddA. M.DL2000. PCR identification of yddA was cloned in E. coli K-12 with pMD-18T. 1. PCR verification of the yddA gene use plasmid as template.

Table 1. Primers used in this paper

| primer     | Sequence(5’to3’)                                      | Size(bp) |
|------------|-------------------------------------------------------|----------|
| yddA-F     | CGCGGATCC ATGATAACCATTCATCCATTACGCT                  | 32       |
| yddA-R     | GGAGGCTCTTTTATAAAACCAGCGCTAAATGTCAC                  | 31       |
| pKD46-F    | AGAGCTGGGCGCGTCACTAC                                  | 20       |
| pKD46-R    | TCGTACTGTGTCTCCCCAGGC                                 | 20       |
| K-acrB F   | GGATACCGCTGCGGCAATCCGTGACTGGCGAAGATGGCGAACCCTGTAG    | 71       |
|            | GCTGGAGGTGGCTTCTC                                     |          |
| K-acrB R   | CAACGGTTCCTTCTTCTTCTGTCAGATAGTAATGCGTTACCTCATGATGAA  | 66       |
|            | TATCCTCCCTTAG                                         |          |
| K-yddA-F   | ATGATAACCATTCATTACGCTTCGTATGTGTGATAGGAAAGTATGTTGAGGC | 65       |
| Primer   | Sequence                  | Length |
|----------|---------------------------|--------|
| K-yddA-  | TGGAGCTGCTTC              |        |
| R        | TTATAAAAACCGCGCTAATGTCAAAATATCATCGCCAGGTCCCACATATGA | 65     |
|          | ATATCCTCCCTTAG            |        |
| T-acrB-  | GAACTACGACATCATCGCAGAG    | 22     |
| F        | TCAAAGGAACGAACGCAATAC     | 21     |
| R        | CGTACTTTCTGGCTTGATATG     | 20     |
| T-yddA-F | TTACATTGAAAAACTGGAGGG     | 20     |
| R        | TGGAAACTCACCCAGGGATTG     | 20     |
| Cm-F     | ATAAATCCTGGTGTCCTCTGT     | 20     |
| Cm-R     | CAGTCATAGCCGAATAGCCT      | 20     |
| Kan-F    | CGGACACAGTGCATGAATCC      | 20     |
| Kan-R    | CTGGTGCGAAGAAAGTGTTT      | 20     |
| RT-gapA-F| TGATGCCGAAGTTATCGTTG      | 20     |
| RT-gapA-R| CCATAACCTGATGTACATGTCC    | 22     |
| RT-acrB-F| CGATAACCTGATGTACATGTCC    | 22     |
| RT-acrB-R| CCGACACATCAGGAGCCG       | 20     |
| RT-yddA F| GCAGTTATTAGCCGAGG        | 20     |
| RT-yddA-R| CCAGTTCAGCAAGTTGTGCA     | 20     |