

Deletion of a minor global regulator *yieP* greatly improves the tolerance of *Escherichia coli* to 3-hydroxypropionic acid

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3-Hydroxypropionic acid (3-HP) is an important platform chemical which can be converted to many useful chemicals. The toxic effects of 3-HP on cell growth and viability is a serious challenge for its industrial biological production. In this study, a highly 3-HP tolerant strain was developed from *Escherichia coli* W by adaptive laboratory evolution (ALE). Genome analysis indicated that 13 genes including *glpK* and *yieP* were mutated during ALE. For the mutated genes, contribution to 3-HP tolerance was studied by multiplex automated genome engineering (MAGE). Interestingly, a nonsense mutation in *yieP* alone was fully responsible for the improved tolerance to 3-HP. Mutation or complete deletion of *yieP* conferred a similar 3-HP tolerance to other *E. coli* strains. The study on 3-HP tolerance mechanism conferred by  $\Delta yieP$  is in progress