

Evolutionary metabolic engineering of the 3-hydroxypropionic acid biosynthetic pathway using a synthetic biosensor

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Evolutionary metabolic engineering has great progress for improving the metabolite-producing strains. In this case, it is important to develop an efficient screening method because of the low probability of incidence of positive mutants in a library. Therefore, in this study, a synthetic biosensor using a transcription regulator was constructed and optimized for the efficient accomplishment of the evolutionary metabolic engineering. As the target metabolic pathway, the production pathway of 3-hydroxypropionic acid (3-HP), one of the important platform chemicals, has been adopted. The results indicate the successful applications to the 3-HP production pathway engineering, especially for enzyme engineering. Therefore, the strategy used in this study could expedite the strain improvement in the field of metabolic engineering by developing a high-throughput screening method.