Fine-tuning of metabolic pathway by 5'-UTR redesign for enhanced production of L-tyrosine in *Escherichia coli*

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L-tyrosine is a commercially important compound in the food, pharmaceutical, chemical, and cosmetic industries. Several attempts to improve L-tyrosine production have been implemented, but regulation of translation-level expression and carbon flux rebalancing around PEP node still has proven to be achieved for optimizing the pathway. Here, to optimize the L-tyrosine biosynthetic pathway, a synthetic constitutive promoter and a synthetic 5'-UTR were introduced for each genes to allow for control at both transcription and translational levels. Carbon flux rebalancing was achieved by controlling the expression level of PEP synthetase using UTR Designer. The L-tyrosine productivity of the engineered *Escherichia coli* strain was increased through pathway optimization resulting in 3.0 g/L of L-tyrosine titer, 0.0354 g L-tyrosine/h/g DCW of productivity, and 0.102 g L-tyrosine/g glucose yield. Thus, we showed that fine-tuning of 5'-UTR is an effective strategy for improved production of L-tyrosine.