

Systems metabolic engineering of *Escherichia coli* for L-valine and L-threonine production

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By combined genome engineering, transcriptome analysis, and genome-scale metabolic flux analysis, we constructed genetically-defined *Escherichia coli* strains overproducing L-valine (Val) and L-threonine (Thr). The final engineered *E. coli* Val overproducing strain showed an impressively high yield of 0.378 g Val per g glucose. The Thr overproducing strain showed even higher yield of 0.393 g Thr per g glucose, and finally produced 82.4 g/l Thr by fed-batch culture. The strategy of systems metabolic engineering reported here can be employed for developing genetically-defined organisms for the efficient production of bioproducts.

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