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## Enhancement of fatty alcohols production with modified *Escherichia coli* strains

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Microbial synthesis of fatty alcohols from renewable resources has attracted increasing attentions. We designed a novel strategy for fatty alcohol production based on fatty acid starvation. For the first time, the deletion of acyl-ACP thioesterases coupled with overexpression of exogenous fatty acyl-ACP reductase were employed to enhance fatty alcohol production. Fatty alcohol titer increased about 58% while the accumulation of fatty acids concentration decreased 73%. In order to explore the effects of acyl-ACP thioesterase deletion on the biosynthesis of fatty alcohol, we performed whole-genome transcriptional analysis. Deletions of *ldhA*, *pta* and *ackA* from KLCB coupled with over expression of FAR were performed and resulted in strain MGL2. The highest OD600 were increased from 5.2 to 7.8. The fatty alcohol titer was increased from 756 mg/L to 2024 mg/L. Fed-batch fermentations with MGL2 were performed in a 3-L Bioflo 110 fermentor using defined LB medium. Total fatty alcohol accumulation reached a maximum of 6.33 g/L after 50 h. At the same time point, OD600 reached 46. Two saturated fatty alcohols (C14:0 and C16:0) and two unsaturated ones (C16:1 and C18:1) are the major components. C14:0 (2.42 g/L) and C16:1 (1.81 g/L) are the two most abundant fatty alcohols, constituting 38.2% and 28.6% of total fatty alcohols, respectively. The percentage of unsaturated fatty alcohols was up to 36.5% of the total fatty alcohols. Notably, our best strain MGL2 produced 6.33 g fatty alcohols

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