

Improve production of 2,3-butanediol from lignocellulose biomass hydrolysate using  
metabolical engineering of *Enterobacter aerogenes*

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In our previous report, *Enterobacter aerogenes* was engineered for glucose and xylose co-utilization and 2,3-butanediol production. Here, the strain EMY-22 was further engineered to improve the 2,3-butanediol titer, productivity, and yield by reducing byproducts production. To reduce succinate production, the budABC operon and galP gene were overexpressed in the strain, which increased the 2,3-butanediol production. For further reduction of succinate and 2-ketogluconate production, maeA was selected and overexpressed in the strain. The optimally engineered strain produced 2,3-butanediol with longer production duration and reduced byproduct formation from sugarcane bagasse hydrolysate in flask cultivation. The engineered strain showed 66.6, 13.4, and 16.8% improvements in titer, yield, productivity of 2,3-butanediol, respectively, compared to its parental strain in fed-batch fermentation. This study proved that the metabolic engineering for reduced byproduct formation was a promising strategy to improve 2,3-butanediol fermentation using lignocellulosic biomass.