

Genetic Change in *Escherichia coli* KJ122 That Improved Succinate Production from an Equal Mixture of Xylose and Glucose

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Abstract : *Escherichia coli* KJ122 was engineered to produce succinate from glucose using the wild type GalP for glucose uptake instead of the native phosphotransferase system (ptsI mutation). This strain ferments 10% (w/v) xylose poorly. Mutants were selected by serial transfers in AM1 mineral salts medium with 10% (w/v) xylose. Evolved mutants exhibited a similar improvement, co-fermentation of an equal mixture of xylose and glucose. One of these, AS1600a, produced 84.26 ± 1.37 g/L succinate, equivalent to that produced by the parent (KJ122) strain from 10% glucose (85.46 ± 1.78 g/L). AS1600a was sequenced and found to contain a mutation in galactose permease (GalP, G236D). Expressing the galP* mutation gene in KJ122 Δ galP resembled the xylose utilization phenotype of the mutant AS1600a. The strain AS1600a and KJ122 Δ galP (pLOI5746; galP*) also co-fermented a mixture of glucose, xylose, arabinose, and galactose in sugarcane bagasse hydrolysate for succinate production.

Keywords : xylose, furfural, succinate, sugarcane bagasse, *E. coli*

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