Production of 1,2-propanediol from Methanol by Metabolic Engineered *Methylobacterium extorquens* AM1

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Nowdays, methanol is attractive candidate for a carbon feedstock. In contrast with sugar, methanol is not only non-food feedstock, but also price is lower than glucose. In this study, we constructed metabolically engineered *Methylobacterium extorquens* AM1 well known methylotroph for producing industrial chemicals in various study as a whole cell biocatalyst to produce 1,2-propanediol (1,2-PDO) from methanol. 1,2-PDO is building blocks in plastics industry, in de-icing and anti-freeze fluids, and as additive in pharmaceuticals, laundry detergent, cosmetics, and so on. To produce 1,2-PDO, heterogenous genes for 1,2-PDO biosynthesis pathway were introduced in *M. extorquens* AM1. Firstly, dihydroxyacetone phosphate (DHAP) was converted to methylglyoxal by mgsA (methylglyoxal synthase). In sequence methylglyoxal was converted to hydroxyacetone by yqhD (NADP-dependent alcohol dehydrogenase). Lastly, 1,2-PDO was produced from hydroxyactone by gldA (glycerol dehydrogenase). We confirmed constructed biosynthetic pathway working properly by enzyme assay. Finally, biotransformation of methanol to 1,2-PDO was verified in flask scale.