Metabolic evolution of *Mannheimia succiniciproducens* for the succinate production and its proteomic characteristics

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Mannheimia succiniciproducens utilizes sucrose as a carbon source for the production of succinate. To improve the cell growth and volumetric productivity of succinate, a combined strategy of metabolic engineering and evolutionary engineering was introduced. Recently identified sucrose utilization system in *M. succiniciproducens* was composed of sucrose phosphotransferase (PTS), sucrose 6-phosphate hydrolase, and fructose (PTS). The sucrose 6-phosphate hydrolase was overexpressed. The overexpression of sucrose 6-phosphate hydrolase followed by adaptive evolution under the growth-maximized condition increased specific growth rate and succinate productivity. The evolved strain fermented mixed sugars more rapidly than the parent strain. Then, comparative proteome analysis was carried out to uncover metabolic characteristics of this evolved strain. [This work was supported by the Advanced Biomass R&D Center(ABC) of Global Frontier Project funded by the Ministry of Education, Science and Technology. Further supports by the World Class University Program(R32-2008-000-10142-0) of the MEST were appreciated.]