

## Reconstruction of the Central Metabolism in *Methylobacterium* sp. DH-1 for Aerobic Production of Succinate

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Methane is considered a next-generation carbon feedstock due to its abundance, low price and a high degree of reduction per carbon. Methanotrophs with capability of methane utilization are fascinating systems for methane bioconversion. A novel type I *Methylobacterium* sp. DH-1 is identified as a promising candidate for use in industrial biocatalytic methane conversion processes. Among many products, succinate has considered as the top building block chemical, which can be used for agricultural, food, pharmaceutical, and cosmetic industries. In this study, an aerobic succinate production system was developed to enable *Methylobacterium* sp. DH-1 to accumulate succinate as the desired product under aerobic conditions by inactivation of succinate dehydrogenase (sdh) and reconstruction of glyoxylate shunt to redirect the fluxes toward succinate. Cell growth and succinate production was increased significantly to 134 mg/L during 6-day cultivation with a productivity of 0.233 mmol/g/day DCW in methane-grown shake-flask cultures when the glyoxylate bypass was activated.