Metabolic Engineering of Solventogenic *Clostridium acetobutylicum* for Enhanced Production of Butyric Acid

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Clostridium acetobutylicum has been considered an attractive platform-host for biorefinery due to its metabolic diversity. Considering its capability to overproduce butanol through butyrate, it was thought that butyric acid can also be efficiently produced by this bacterium through metabolic engineering. The *pta-ctfB*-deficient *C. acetobutylicum* CEKW, in which genes encoding phosphotransacetylase and CoA-transferase were knocked-out, was assessed for its potential as a butyric acid-producer in fermentations with four controlled pH-values at 5.0, 5.5, 6.0, and 6.4. The CEKW strain was further engineered by knocking-out the *adhE1* encoding aldehyde/alcohol dehydrogenase to prevent solvent-production. The simultaneous deletion of the *pta-ctfB-adhE1* resulted in metabolic switch from biphasic to acidogenic fermentation enhancing butyric acid-production. [This work was supported by the Technology Development Program to Solve Climate Changes on Systems Metabolic Engineering for Biorefineries from the Ministry of Science, ICT and Future Planning (MSIP) through the National Research Foundation (NRF) of Korea (NRF-2012-C1AAA001-2012M1A2A2026556).]