

Production of L-malic acid using a metabolically engineered *Mannheimia succiniciproducens* strain

Martin Gustafsson<sup>1,2</sup>, Sol Choi<sup>1</sup>, 이상엽<sup>1,3,†</sup>

<sup>1</sup>MBEL, Department of Chemical and Biomolecular Engineering (BK21 program), KAIST;

<sup>2</sup>KTH Royal Institute of Technology; <sup>3</sup>BioInformatics Research Center, BioProcess Engineering Research Center, KAIST

(leesy@kaist.ac.kr<sup>†</sup>)

L-Malic acid (MA) is a commonly used chemical. The Gram-negative bacterium *Mannheimia succiniciproducens* has a strong anaplerotic pathway, suggesting that it has good potential for malic acid production. Thus, we aimed to create an efficient malic acid production strain, starting from a succinic acid producing *M. succiniciproducens* previously developed in our lab. By deletion of the *fumC* gene encoding fumarase, the conversion of malic acid to fumarate was blocked, resulting in accumulation of malic acid as the main product. These results provide useful information for the rational metabolic engineering to improve MA production in strains with strong anaplerotic pathways. [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). MG was additionally supported by the Swedish research council Formas].