

Identification and Characterization of *Thermoplasma acidophilum* Aldolases

임성한, 이선복*
포항공과대학교
(sblee@postech.ac.kr*)

The hyperthermophilic archaeon *Thermoplasma acidophilum* is known to have modified version of ED (Entner-Doudoroff) pathway. A key enzymes of this pathway, KDG (KDPG) aldolase, catalyzes the cleavage of KDG (KDPG) to glyceraldehyde (glyceraldehyde-3-phosphate) and pyruvate, and the subsequent conversion of glyceraldehyde (glyceraldehyde-3-phosphate) to glycerate (glycerate-3-phosphate) by glyceraldehydes dehydrogenase. In our previous studies, we identified and characterized glyceraldehyde dehydrogenase, and it was suggested that modified ED pathway of *T. acidophilum* is a non-phosphorylative variant of the classic pathway. In this study, three hypothetical *T. acidophilum* aldolase genes (TA0619, TA0745, TA1157) were cloned and expressed in E.coli BL21 (DE3) CodonPlus strain. The substrate specificities of three aldolases were evaluated in the synthetic direction with a range of aldehyde substrates. This revealed non-phosphorylative ED pathway in *T. acidophilum* is another example of the versatility and flexibility of extremophile metabolic pathways.