

Simultaneous production of 3-hydroxypropionic acid and 1,3-propanediol from glycerol using resting cells of the lactate dehydrogenase-deficient recombinant *Klebsiella pneumoniae* overexpressing an aldehyde dehydrogenase

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Klebsiella pneumoniae, which overexpresses aldehyde dehydrogenase (ALDH), can coproduce 3-hydroxypropionic acid (3-HP) and 1,3-propanediol (PDO) from glycerol. In the present study, the lactate dehydrogenase-deficient (*ldhA*-) recombinant *K. pneumoniae* overexpressing an ALDH (KGSADH) was developed and the co-production of 3-HP and PDO from glycerol by this recombinant under resting cell conditions was examined. The new recombinant did not produce any appreciable lactate, which seriously inhibits the production of 3-HP and PDO. The final titers of 3-HP and PDO by the *ldhA*-recombinant strain at 60 h were 252.2 mM and 308.7 mM, respectively, which were improved by approximately 30 and 50%, respectively, compared to those by the counterpart recombinant strain, which was the wild type for *ldhA*. In addition, after deleting *ldhA*, the cumulative yield on glycerol and specific production rate of these two metabolites (3-HP and PDO) were enhanced by 41.4% and 52%, respectively.