TITLE OF THE INVENTION: PRODUCTION OF 1,4-BUTANEDIOL VIA CONDENSATION OF C1-DERIVED FORMYL-COA AND 3-HYDROXYPROPIONALDEHYDE DERIVED FROM GLYCEROL

Abstract

This invention provides a non-naturally occurring genetically modified microbial organism that has been engineered to produce 2,4-dihydroxybutanal, 1,2,4-butanetriol, 4-hydroxybutanal or 1,4-butanediol using a pathway which enables the condensation of formyl-CoA with 3-hydroxypropionaldehyde derived from glycerol. The modified microbial organism has been further engineered to produce glycerol from ethylene glycol or C1 compounds via condensation of formyl-CoA with glycolaldehyde and formaldehyde. This invention provides a method for the production of 2,4-dihydroxybutanal, 1,2,4-butanetriol, 4-hydroxybutanal or 1,4-butanediol via the condensation of formyl-CoA with 3-hydroxypropionaldehyde. This invention also provides a method for the production of glycerol via the condensation of formyl-CoA and glycolaldehyde. This invention additionally provides a method for the production of glycolaldehyde via the condensation of formyl-CoA and formaldehyde. Further, this invention provides a method for the formation of formyl-CoA from methane, methanol, formaldehyde or formate.

[Figure 3]