

Development of bioconversion process (Glycerol to 1,3-Propanediol) for the production of chemical feedstocks using nanobiocatalysts (nano-enzymes)

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1,3-propanediol (PDO) has numerous applications in polymers, cosmetics, foods, lubricants, and medicines. Industrial PDO production has attracted attention as an important monomer for synthesizing a new type of polyester, polytrimethylene terephthalate (PTT). Glycerol is a kind of low cost renewable resource appearing in increasing. Glycerol can be converted to PDO by several microorganisms including Clostridia, Citrobator, Lactobacillus and Klebsiella. Clostridium and Klebsiella ferment glycerol to PDO in a high yield and productivity and have been intensively studied. In this research, we will improve the productivity of 1,3-PDO with Klebsiella pneumoniae derived from the biodiesel process, optimizing fermentation conditions was performed by changing environmental factors. Glycerol dehydratase and 1,3-propanediol dehydrogenase had been proved two key enzymes for 1,3-PDO production by Klebsiella pneumoniae. And cultivate bioconversion enzymes using 1,3-PDO production strain. Using fermentor, the enzymes are produced and separate for nano-biocatalysis development.