Development of an efficient ethanolic *Escherichia coli* mutant strain by inserting *zymomonas mobilis* genes

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Due to dwindling of fossil fuel, microbial production of bio-fuel from organic byproducts has acquired significance in recent years. Ethanol has been trusted as an alternate fuel for the future. The ethanologenic pathway in *Z. mobilis*, like that of *saccharomyces cerevisiae*, consist of two essentail activities, pyruvate decarboxylase and alcohol dehydrogenase. These two activities and the enzymes of glycolysis comprise 30 to 50% of the soluble protein in *Z. mobilis*. By inserting *Z. mobilis* genes encoding pdc and adhB in *E. coli*. *E. coli* was able to ferment sugars into ethanol. This study *Z. mobilis* were used as the construction sources of genes and plasmids. Expression vectors were constructed by using pET-32a vectors. Ethanol productivity in *E. coli* strain seemed to be affected by the extent of expresstion of pdc gene along with adhB genes. By successful gene mutation we could establish a new *E. coli* strain which can produce ethanol efficiently. The wild-type *E. coli* cannot produced ethanol. So, recombination for ethanolic *E. coli* was investigated in this study. Also to confirm the production of ethanol, fermentation experiment of recombinant *E. coli* was performed in aerobic conditions.