Encoding pyruvate decarboxylase and alcohol dehydrogenase genes of *zymomonas mobilis* in *Escherichia coli* BL21 to produce Ethanol

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In the present, high cost in the petroleum market, green house effect, and the fossil fuel reliability are great problems, and Bio-ethanol is the best solution to these problems. Ethanol has been trusted as an alternate fuel for the future. The ethanologenic pathway in *Z. mobilis* (*Zymomonas mobilis*), like that of *saccharomyces cerevisiae*, consist of two essentail activities, pyruvate decarboxylase*(pdc)* and alcohol dehydrogenase (*ADH*). 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 pyruvate decarboxylase and alcohol dehydrogenase II in *E. coli*. *E. coli* was able to ferment sugars into ethanol. This study *Z. mobilis* (containing *pdc* and *adhB* genes) were used as the construction sources of genes and plasmids. Expression vectors carrying *pdc* and *adhB* genes 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 established a new *E. coli* strain which can produce ethanol efficiently by fermentation in aerobic conditions.