

Effect of Soluble and Insoluble Fraction of Xylose Isomerase on the Xylose Utilization in the Recombinant Yeasts Under Galactose Supplemented Conditions

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Saccharomyces cerevisiae has widely been used in the ethanol production. However, it cannot utilize the pentose sugar in feed-stocks as a carbon source such as arabinose, fructose and xylose. We constructed recombinant *Saccharomyces cerevisiae* harboring the xylose isomerase (XI) gene isolated from *Clostridium phytofermentans* to metabolize xylose and use it as a carbon and energy source. In this study, galactose effect including soluble and insoluble fraction of XI. In this result, glucose was not affected by the heterologous expression of XI. However, supplemental galactose added to the recombinant *S. cerevisiae* stimulated xylose utilization as well as the expression of XI protein. In addition, galactose exhibited highest expression of insoluble fraction more than soluble fraction. As a result, high expression insoluble fraction of XI was significantly increased xylose uptake. Therefore, controllable expression system, in which the insoluble fraction of XI, was achieve high level of xylose consumption and subsequent ethanol production.