Expression of the XI and XK from *Clostridium phytofermentans* improves xylose utilization of recombinant *Sacchromyces cerevisiae*

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Clostridium phytofermentans has the ability to fermentans broad range of feed-stocks. In *C. phytofermentans*, xylose isomerase (XI) catalyzes the reversible isomerization of D-xylose to D-xylulose, and xylulokinase (XK) converts D-xylulose to D-xylulose-5-phosphate which enters the pentose phosphate pathway.

To study expression of bacterial XI and XK in *S. cerevisiae*, the XI mutant of this yeast was used as a recipient strain for transformation with the plasmids pYES2 carrying the *C. phytofermentans* XI gene. This result showed that cells are able to grow with xylose as sole carbon source. It also found that level of ethanol production was increased by fermentation of xylose, comparing with normal *S. cerevisiae*. It was also showed the more efficient fermentation of xylose to ethanol yield in recombinant *S. cerevisiae*, comparing a prototypic *C. phytofermentans*.

Recombinant strain of *S. cerevisiae* engineered for improved xylose utilization are described in this study. This strain harboring XI and XK isolated from *C. phytofermentans*, shows a significant increase in ethanol productivity with xylose utilization.