

Fig 1: Because sugars (glucose, xylose, etc.) are polar, special membrane proteins are required for them to pass through the cell membrane.

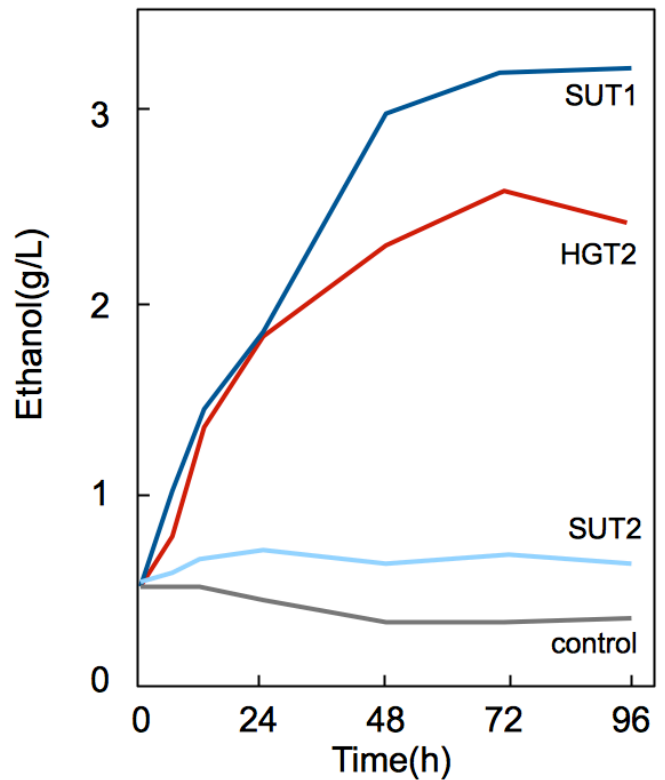
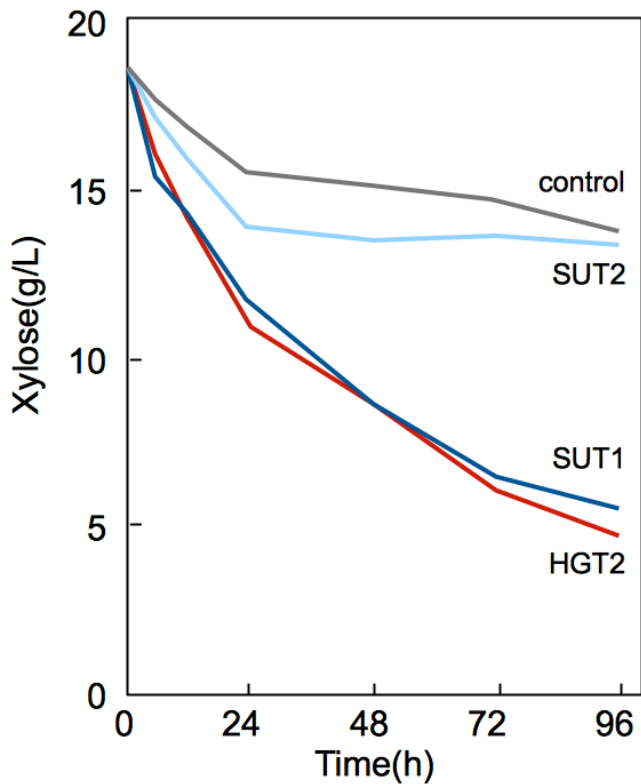


Fig 2: *S. cerevisiae* that were modified with plasmids taken from *P. stipites* were cultivated in medium with 20g/L of xylose as the carbon source. In the control sample, xylose consumption was extremely low, and no ethanol production was detected. On the other hand, SUT1 and HGT2 showed 2.7 times and 2.9 times the xylose content of the control sample after 4 days. Ethanol was also produced at 3.2g/L and 2.4g/L respectively.