

System Analysis of *Lipomyces starkeyi* During Growth on Various Plant-Based Sugars

Background/Objective

Oleaginous yeasts have substantial lipids storage capability that can be utilized directly or processed into various bioproducts and biofuels. *Lipomyces starkeyi* is an oleaginous yeast capable of using multiple plant-based sugars, such as glucose, xylose, and cellobiose, but is a relatively unexplored yeast due to limited knowledge about its physiology.

Approach

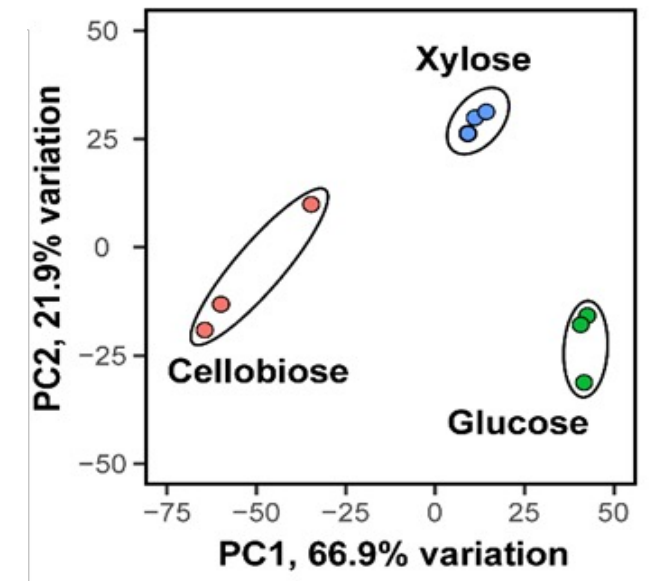
Evaluated the growth of *L. starkeyi* on glucose, xylose, and cellobiose, and then performed transcriptomic and metabolomic analyses to understand the mechanisms of sugar metabolism.

Results

- Principal component analysis showed clear differences resulting from growth on different sugars and reported various metabolic pathways activated during growth on these sugars.
- We observed non-specific regulation in *L. starkeyi* and updated the gene annotations for the NRRL Y-11557 strain.

Significance/Impacts

This analysis provides a foundation for understanding the metabolism of these plant-based sugars and potentially valuable information to guide the metabolic engineering of *L. starkeyi* to produce bioproducts and biofuels.



The principal component analysis plot generated from gene expression profiles of *L. starkeyi* grown on glucose, xylose, and cellobiose.