Clean Technology

Improved S. Cerevisiae Strains for Anaerobic Xylose Fermentation and High Stress Tolerance

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a Saccharomyces cerevisiae yeast strain capable of fermenting xylose anaerobically that tolerates high-stress conditions.

Overview

Worldwide renewable energy sources are in high demand due to climate change combined with rapid depletion of fossil fuel reserves. Bioethanol remains the most attractive choice as an alternative to conventional fuels, and yeast is the organism of choice for industrial production of ethanol because of its high ethanol tolerance and ability to ferment under strictly anaerobic conditions. Xylose is a highly abundant sugar that can be commercially fermented into ethanol, and several approaches have been developed to engineer yeast to transport and ferment xylose into ethanol. Y128 is a yeast strain that is capable of fermenting xylose anaerobically but is sensitive to certain stresses, which means it is not industrially viable for fermentation.

The Invention

UW-Madison researchers have generated a yeast strain capable of fermenting xylose anaerobically that tolerates high-stress conditions. The Y128 strain was crossed with the hydrolysate-tolerant wild strain YPS128, which generated hundreds of haploid spores. The spores were screened, and one strain, 46.2, outperformed Y128 in the rate of xylose consumption, total xylose consumption, and ethanol production in anaerobic bioreactors. This new strain therefore has a high rate of xylose fermentation and increased stress tolerance.

Applications

- Industrial production of ethanol for clean energy

Key Benefits

- Demonstrated high rate of anaerobic xylose fermentation and high stress tolerance

Additional Information

For More Information About the Inventors

- Audrey Gasch

Tech Fields

- Clean Technology : Biobased & renewable chemicals & fuels

For current licensing status, please contact Jennifer Gottwald at jennifer@warf.org or 608-960-9854