Biomass Program

Sugars R&D

Development of New Sugar Hydrolysis Enzymes

A few decades ago, the National Renewable Energy Laboratory (NREL) isolated a thermophilic organism, *Acidothermus cellulolyticus*, from a hot spring. Several glycohydrolases, enzymes that hydrolyze sugars, have been identified by NREL and the national lab has teamed with Genencor International to characterize these enzymes. Researchers will determine the enzymes' tolerance to different temperatures, the range of compounds (substrate) the enzymes will react with, and their specific activity (amount of substrate the enzyme can convert in a minute per unit mass of enzyme).

The scope of this project also includes characterization of another family of glycohydrolases, enzyme modification to improve properties, and subsequent characterization of the resulting enzyme mutants. The goal of this work is to develop glycohydrolases with properties of use in commercial applications such as utilizing lignocellulosic biomass for biobased chemicals, materials, and fuels.

R&D Pathway

Genencor and NREL will characterize a number of glycohydrolases that were previously identified by NREL for thermotolerance, substrate range, and specific activity. The structure-function characteristics of another family of glycohydrolases will be studied and modified for improved properties.

Benefits

- **Improved enzymes for efficient biomass breakdown**

Applications

The development of improved biomass hydrolysis enzymes will increase the viability of the biobased economy.

Project Partners

Genencor International
National Renewable Energy Laboratory

Project Period

FY 2000 – FY 2004

For more information contact:

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Visit the Web site for the Office of the Biomass Program (OBP) at www.eere.energy.gov/biomass.html

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