



Technology Commercialization Opportunity

Ethanol Production from Woody Biomass

UGARF Case: 1356

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Intellectual Property Status: PCT Application filed

Introduction

In 2008, Brazil and the United States accounted for 89% of the world's ethanol fuel production. The vast majority of raw material used to generate ethanol fuel is currently either sugar- or starch-based. While sugar can simply be extracted from sugar-based material and fermented, use of the starch-based material requires that it be saccharified with acids or enzymes before undergoing fermentation. Moreover, hydrolysis of cellulose-based material, especially in the presence of lignin such as woody biomass, is significantly more difficult than their starch based equivalent. Economically however, it would be of great benefit to use cellulose for fuel production as it is not used for food and can be grown all over the world. Thus, given the ubiquitous nature of lignocellulosic material, it would be quite lucrative to develop a commercially viable process for producing ethanol from softwood stems.

Technology Summary

Researchers at the University of Georgia developed a microbial process comprising highly efficient and simultaneous saccharification and fermentation (SFF) thus significantly reducing the cost of ethanol production from lignocellulosic material. Cost reduction around 20%, in comparison with other means, has been verified. They have not only identified a method to acclimatize the microorganism used for cellulosic ethanol production, but have also identified a means of more efficiently producing ethanol by recycling by-products generated during the SSF process.

Advantages

- Scalable, using readily available biomass
- Obviates the need for saccharification as an independent production process
- Small number of steps from biomass to biofuel
- Less costly, by almost 20%, than traditional means of EtOH production from cellulosic biomass
- Independent of specially designed organisms

Potential Applications

- Biofuel production from a variety of woody biomasses, wastes from forestry, agricultural, wood, and paper industries, including trees lost due to diseases or other natural events

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