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Available Technologies

Improved Processes for the Production of Proteins and Chemicals in Fungus Utilizing Bioprocessing

SUMMARY

Researchers at PNNL have developed an improved process for the production of proteins and chemicals in fungal bioprocesses. The technology is an improved bioprocess obtained through genetic manipulation of fungal morphology.

Fungi are widely utilized for production of a variety of commercially useful products. Most of these bioprocesses for industrial scale production of chemicals and proteins use species of fungi that are characteristically referred to as filamentous fungi. Utilization of a filamentous fungus species for production of desired compounds most often involves growing submerged cultures of the fungus. When these fungi exhibit filamentous growth in submerged culture it results in increased viscosity of the culture medium, thus adversely affecting mass transfer rates and energy input for aeration and mixing. These culture properties are typically associated with decreased productivity. Alternatively, "filamentous" fungi can exhibit pellet morphology, which provides a lower viscosity, a reduction in the power needed for mixing and aeration of the culture, and increased productivity of the desired product.

This process offers the ability to promote a desired morphology in fungi through genetic manipulation in order to optimize productivity. In particular, the technology exploits isolated fungal promoters and transcription terminators that are associated with fungal morphology control genes for regulation of gene expression in a fungus as well as methods for promoting enhanced production of desired chemicals and proteins.

ADVANTAGES

- * Filamentous fungi are a "green" source for many important compounds, including organic acids, antibiotics and other therapeutics.
- * Reduced viscosity results in reduction of needed power for mixing and aeration during culture.
- * Increased production of the desired product such as proteins and/or chemicals.



Technology Portfolio(s)

- » Bio-processing
- » Renewables
- » Bio-based

Potential Industry Applications

- » Chemicals
- » Energy & Utilities
- » Healthcare, Pharma, Biotech & Medical
- » Recycling & Waste Management

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