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Cyanobacterial Strain and Culture Method for Photoautotrophic L- Phenylalanine Production

Fast-growing cyanobacteria produce L-phenylalanine from non-food waste streams at ~7× higher yields for low-cost, sustainable manufacturing.

Researchers at Purdue University have discovered a new resource-efficient, environmentally friendly, and cost-effective method to produce L-phenylalanine. L-phenylalanine is an amino acid used in animal feed and artificial sweeteners. Currently, L-phenylalanine is produced by fermentation of glucose using E. coli and C. glutamicum bacteria. This method relies on agriculture for its supply of raw materials such as glucose thereby competing with resource availability for food production. The method developed by Purdue researchers does not rely on glucose obtained from production agriculture. Instead, it permits production of L-phenylalanine using liquid waste, in non-arable areas like raceway ponds. This method uses an engineered fast growing blue green algae strain that can produce 7-times more L-phenylalanine compared to the other cyanobacteria.

Advantages:

-Inexpensive raw material

-Environmentally friendly

-Resource-efficient

Potential Applications:

-Biochemicals

-Biofuel precursor

-Animal feed

-Aquaculture

Technology ID
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Category
Agriculture, Nutrition, & AgTech/Livestock & Animal Health Solutions
Chemicals & Advanced Materials/Specialty & Performance Chemicals
GreenTech/Circular Economy & Waste Reduction

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Technology Validation: The researchers tested and selected the bacterial strain that produces the most L-phenylalanine.

TRL: 5

Intellectual Property:

CIP-Patent, N/A, United States

Provisional-Patent, 2021-07-08, United States

Utility Patent, 2022-07-07, United States

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