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Cyanobacterium that Produces Neutral Lipids

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Inventors

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Invention Description

Photosynthetic bacteria potentially provide a source of lipids that is relatively easy to harvest and convert into biofuels. To increase the efficiency of this system it would be beneficial to use a bacterial strain that produces lipids that are readily converted to biofuels, such as neutral lipids. Hence, there is a need for a photosynthesizing bacterium that produces high concentrations of neutral lipids.

Researchers at the Biodesign Institute of Arizona State University have developed a cyanobacterium capable of producing neutral lipids. The cyanobacterium regulates expression of a nucleic acid encoding a protein capable of hydrolyzing the lipid membranes. This allows at least one enzyme to degrade the cellular lipid membranes and the peptidoglycan layer of a bacterial cell wall. Such degradation allows for ready harvesting of the neutral lipids.

Neutral lipids are more readily converted to biofuels than are polar lipids contained in membranes. This technology optimizes the neutral lipid producing capabilities of cyanobacterium and provides a more efficient and cheaper means of extracting neutral lipids from the organism. This can lead to an economical fuel for the future while reducing CO_2 accumulation.

Potential Applications

- Biofuels
- Biodiesels

Benefits and Advantages

- Increases TAG yields
- Increases the level of acyl-CoA in cyanobacteria
- Contains a nickel inducible lysis, and/or Green Recovery, and/or stationary-growth-phase autolysis systems.

Intellectual Property Status:

Patent Pending

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