

Engineering Biofuels from Photosynthetic Bacteria (IN 09001)

Efficient biofuel for the next generation

The Invention

Rising energy costs, supply uncertainties and environmental concerns threaten the security of the United States. Scientists seek to produce fuel from renewable energy sources to help alleviate these concerns. To date, however, many factors (including cost, ease of production and compatibility issues) present obstacles to significant breakthroughs in this field. Scientists at Argonne National Laboratory are engineering photosynthetic bacteria to produce biofuels using a method that overcomes many of the existing challenges.

Researchers produce biofuels or biofuel precursor molecules from agricultural feedstocks using organisms that have not yet been harnessed for this purpose. The method combines both engineered and natural photosynthetic mechanisms to generate the fuel. Photosynthetic bacteria are extremely flexible and can flourish with or without oxygen.

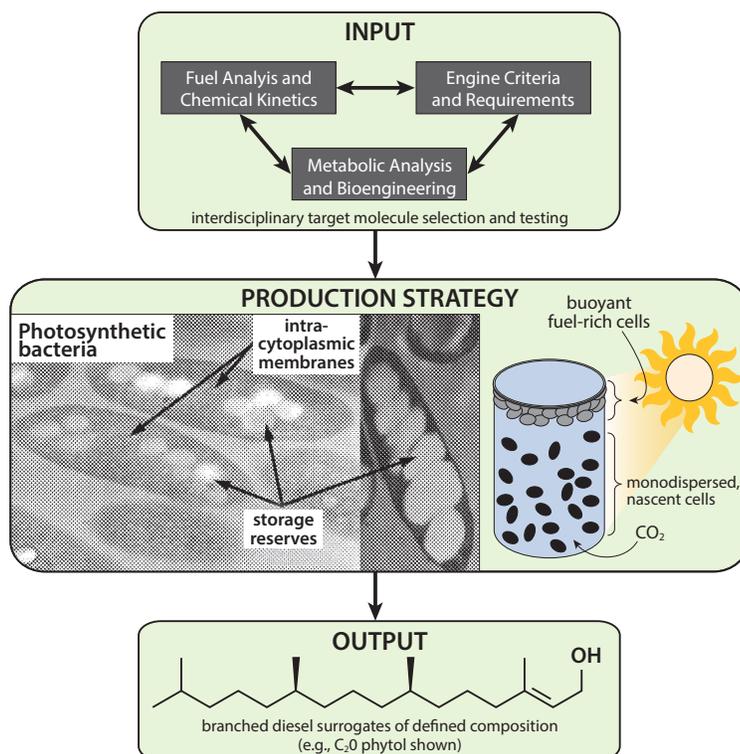
Benefits

- ▶ Ease of engineering: simpler process with substantial yields
- ▶ Absence of competition: employs waste materials not already used for other activities, such as food production
- ▶ Flexibility: can produce biofuels with or without fermentation or distillation
- ▶ Compatibility: can be consumed directly or mixed with other fuels without the need for further refining
- ▶ “Value-added” waste: 30 to 70 percent of the fuel’s waste consists of lipids, which can be used to create other fuel sources

Applications and Industries

Biofuels produced from engineered photosynthetic bacteria will be used to:

- ▶ Power motor vehicles of all kinds, used by industry and the public
- ▶ Fuel other machinery currently powered by gasoline



Schematic of the overall approach including the invented method for production of co-factors and anchors as biofuel precursors.

Developmental Stage

Ready for commercialization

Availability

Available for licensing

Patent Information

US Patent Application 13/159,340

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