Discovery - From Cancer Treatment to Biofuels

Originally studying drug resistant forms of cancer, M. Karen Newell-Rogers, PhD discovered metabolic modifying agents that increase the amount of fat algae cells can produce. Metabolic modifying agents use a process called Metabolic Disruption Technology (MDT), a process also used for drug resistant tumors and increasing Omega-3 fatty acids in fish, shrimp, and eggs. Algae have the potential to produce impressive increases in gallons per acre of oil production compared to other biofuels.

Why Algae?

Algae cells are self-reproducing, easily adapt to their environment, can grow in much smaller places than other plants, and oil from algae is very similar to petroleum oil.

Potential Economic Impacts

Algae-based biofuel can be grown in areas unfavorable for traditional agriculture, such as in seawater, water from saline aquifers, or in factories and facilities, thus not competing with arable land used to support food, fiber, and livestock. The oils derived from algae are similar to those used by the petroleum industry suggesting that existing refineries may be used for refining algal biofuels. Typical algae-derived oil recovery methods require cell destruction or lysis to release the oil, however, MDT allows oil to be excreted from live algae so production systems are continuous. Experimentally, MDT also dramatically increases yields of oil from algae by as much as 300 percent. With the current technology, the United States Department of Energy estimates algal biofuels will cost the consumer more than eight dollars per gallon. MDT provides us a way to dramatically increase production and significantly reduce the cost of oil production and subsequently the cost to the consumer.

On-Going Research

The Texas A & M AgriLife Research Biofuel Program is leading the way in developing new alternative fuel solutions. Using a dynamic process, scientists are continuing to explore additional algal strains, chemical synergies with algae, and potential algae co-products. Current efforts are also aimed at increasing the efficiency of oil production in a variety of plant species such as cucumber, corn, and soybeans. Scientists are also experimenting with algae and other plants to provide other high-value products including Omega-3 fatty acids.

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Collaborators

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