Biofuels: The Promise of Algae

What are Algae?

Algae are single celled or multi-cellular, chiefly aquatic, plant-like organisms. Algae are photosynthetic: like plants, they are nourished by carbon dioxide and nitrogen and release large amounts of oxygen into the atmosphere. There are over 65,000 known species of algae including many different varieties such as red, green, brown, yellow and black.

Commercial Uses:

Algae are important in numerous commercial uses: in the production of pharmaceuticals; treatment of sewage; and as replacements for current coloring agents and dyes. One of the most promising uses of algae is as an alternative energy source. The oil from algae can be used in the production of a variety of biofuels including biodiesel, biobutanol, straight vegetable oil and jet fuel.

Advantages as Biofuels:

Algae are renewable non-food sources of feedstock for biofuels that can be grown on non-arable lands, non-productive water sources or in inexpensive culture systems. A significant advantage of using algae as a biofuel source is that it need not displace land used for growing food sources. The Department of Energy (DOE) reports that algae have the potential to yield at least 30 times more energy than land crops currently used in the production of biofuels.
DOE also reports that the remaining biomass residue can be used in value added byproducts like animal feed, as a fermentation feedstock, or combusted to generate heat.

Current Challenges:

However, there are still some obstacles to overcome. The necessary infrastructure to produce algae biofuels on a commercial scale is not fully in place. One major challenge is the use of controlled systems versus open pond systems. In controlled systems, such as photobioreactors, engineers can regulate the growth rate and species in the environment. However, these systems are expensive. Open pond systems are a less expensive solution but are subject to various uncontrollable environmental factors such as changes in temperature and light and infiltration of invasive species.

Industrial R&D:

Currently, many BIO Member Companies are focused on research in this area. Some companies include:

-Algenol Biofuels, Inc.,
http://www.algenolbiofuels.com/
- Aurora Biofuels
www.aurorabiofuels.com
-Culturing Solutions, Inc.,
http://www.culturingsolutions.com/
-LiveFuels, Inc.,
http://www.livefuels.com/
-HR BioPetroleum, Inc.,
http://www.hrbp.com/
-Solazyme, Inc.
http://www.solazyme.com/