

Video: Chemists develop new process for producing cleaner, cheaper diesel fuel

July 22 2014, by Miles O'brien



With rising gas prices and a desire to lessen the impact of fossil fuel emissions as motivation, scientists are searching for new, cheaper sources of energy, including fuel made from living material, known as biofuel. While current sources of biofuel--such as ethanol made from corn--already exist, scientists like Steve Hutcheson, a professor of microbiology at the University of Maryland, are seeking other options that would not take away from our food supply. With funding from NSF, Hutcheson has found a new approach to producing biofuels from cellulosic biomass--the fibers that make up the structure of plants such as wood, grass or even leftover agricultural products like corn stalks. Part of what makes his discovery innovative is its ability to imagine a new and positive use for something that was having a negative and potentially damaging impact on the environment--a marine bacterium called *Saccharophagus degradans*. Hutcheson says they are the next phase of growth for the biofuel industry that could produce a cheaper alternative to gasoline. Credit: NBC Learn, U.S. Patent and Trademark

Office, and National Science Foundation

Diesel—we know it best as the fuel that does the heavy lifting.

Typically, [diesel fuel](#) is made from [crude oil](#), but scientists can make high-grade diesel from coal, [natural gas](#), plants or even agricultural waste, using a process called Fischer-Tropsch, or "FT." Just about any [carbon source](#) is an option. FT Diesel is the ideal liquid transportation fuel for automobiles, trucks and jets. It's much cleaner burning than conventional diesel, and much more energy efficient than gasoline. But, FT Diesel is expensive to make and generates lots of waste.

With support from the National Science Foundation (NSF) and its Center for Enabling New Technologies Through Catalysis (CENTC), chemists around the United States are working together to improve the cost and energy efficiency of alternative fuels. CENTC scientists have invented and patented, and are bringing toward commercialization, catalysts that will convert light hydrocarbons into FT Diesel, improving the process, whether it's diesel made from traditional sources, such as oil, or alternative sources, such as biomass.



Algae fuel? It's entirely possible! Aerospace engineer Bill Roberts at North Carolina State University believes algae fuel will create an entirely new industry and thousands of new jobs. With support from NSF, Roberts and his team are genetically modifying a specific strain of algae to produce drop-in replacements for a range of transportation fuels. The researchers are primarily interested in new feedstocks, algal oil-based feedstocks and aviation fuels. There is a lot of interest in algae now because it can be grown in marginal lands, in deserts, in ponds and floating in the ocean. The particularly strain of algae Roberts' team is interested in, *Dunaliella*, is a marine micro algae. Credit: National Science Foundation

Provided by National Science Foundation

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