Genome Engineering Could Provide New Method of Creating Diesel

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Diesel fuel. Image credit: Shizhao via Wikimedia Commons

When we think of genetic engineering, our minds often jump to giant tomatoes and animal cloning. However, this is not always the case.

Joule Biotechnologies, Inc. has announced that it has used a process of genome engineering to create organisms that can turn carbon dioxide into hydrocarbons that can be used as fuel. The process will be powered by the sun. Joule is planning to create a viable diesel production process using light and air. In a press release from Joule, the basics of the process are explained:

Joule is advancing a new, photosynthesis-driven approach to producing

renewable fuels, avoiding the economic and environmental burden of multi-step, cellulosic or algal biomass-derived methods. The company employs a novel SolarConverter system, together with proprietary, product-specific organisms and state-of-the-art process design, to harness the power of sunlight while consuming waste CO_2. Its pioneering technology platform has already been proven out with the conversion of CO_2 into ethanol at high productivities, a process that enters pilot development in early 2010. With this latest feat of genome engineering, Joule is now capable of directly producing hydrocarbons - setting the stage for delivery of infrastructure-compatible diesel fuel without the need for raw material feedstocks or complex refining.

The breakthrough was made possible by the discovery of unique genes coding for enzymatic mechanisms that enable the direct synthesis of both alkane and olefin molecules - the chemical composition of diesel. Production was achieved at lab scale, with pilot development slated for early 2011.

Joule is hoping that its process will help reduce dependence on other sources of diesel, fostering better energy independence. The organisms that Joule is engineering are capable of directly secreting hyrdocoarbon molecules. Joule points out that it will be using non-arable land, as the process will not need to grow crops. No fresh water will be needed, either.

The idea of creating diesel using light and air (and a few other components) is an interesting concept if Joule can make it work, and one that could help reduce reliance on oil for diesel fuel, as well as reducing overall carbon emissions present in the diesel fuel production process.