

Escherichia coli bacteria produce diesel on demand

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Professor John Love from Biosciences at the University of Exeter said: "Producing a commercial [biofuel](#) that can be used without needing to modify vehicles has been the goal of this project from the outset. Replacing conventional diesel with a carbon neutral biofuel in commercial volumes would be a tremendous step towards meeting our target of an 80% reduction in [greenhouse gas emissions](#) by 2050. Global demand for energy is rising and a fuel that is independent of both global oil price fluctuations and political instability is an increasingly attractive prospect."

E. coli bacteria naturally turn sugars into fat to build their cell membranes. [Synthetic fuel](#) oil molecules can be created by harnessing this natural oil production process. Large scale manufacturing using *E. coli* as the catalyst is already commonplace in the pharmaceutical industry and, although the biodiesel is currently produced in tiny quantities in the laboratory, work will continue to see if this may be a viable commercial pathway to 'drop in' fuels.

Rob Lee from Shell Projects & Technology said: "We are proud of the work being done by Exeter in using advanced biotechnologies to create the specific hydrocarbon molecules that we know will continue to be in high demand in the future. While the technology still faces several

hurdles to commercialisation, by exploring this new method of creating biofuel, along with other intelligent technologies, we hope they could help us to meet the challenges of limiting the rise in carbon dioxide emissions while responding to the growing global requirement for transport fuel."

More information: "Synthesis of customized petroleum-replica fuel molecules by targeted modification of free fatty acid pools in *Escherichia coli*," by Thomas P. Howard et al. *PNAS*, 2013.

Provided by University of Exeter

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