Bioproduction and Evaluation of Renewable Butyl Acetate as a Desirable Bioblendstock for Diesel Fuel

Goals

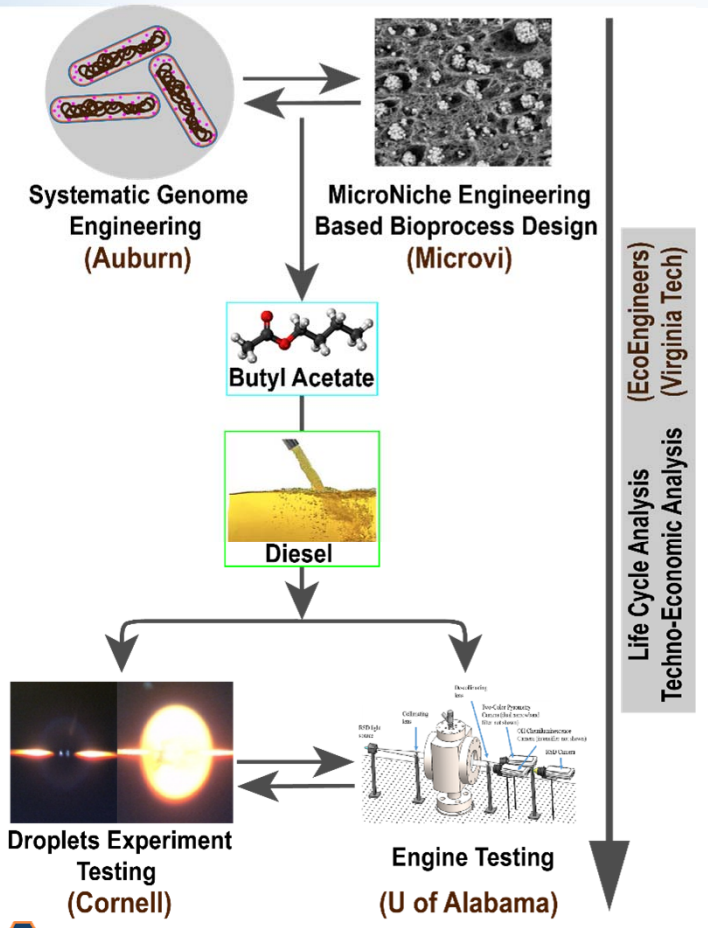
Auburn University (AU) will collaborate with Microvi Biotech, Cornell University (CU) and University of Alabama-Tuscaloosa (UA), to develop an integrated bioprocess for efficient butyl acetate (BA) production. BA will be evaluated for its potential to serve as a bioblendstock for diesel through fundamental experiments on combustion and full-scale engine testing. The project goal is to achieve 30 g/L BA production (with a yield of 0.4 g/g and a productivity of 0.6 g/L/h). Meanwhile, the droplet combustion and engine tests will provide solid evidence supporting BA as a viable bioblendstock for diesel fuel.

Approach

We will develop an integrated bioprocess for efficient BA production through strain development by way of systematic genome engineering and process development based on an technology called MicroNiche Engineering™ technology (MNE). BA will be evaluated for its potential to serve as a bioblendstock for diesel via fundamental experiments on combustion using configurations ranging from the sub-grid element of a fuel spray (i.e., droplet combustion dynamics) to lab scale testing in a CPFR and full-scale engine testing.

Potential Impact on Co-Optima Goals

This project will achieve high-efficient and economic butyl acetate (BA) production from low-value lignocellulosic feedstocks. Meanwhile, the project will provide solid evidence supporting BA as a viable bioblendstock for diesel fuel, including the reduction of the sooting propensity and the promotion of the cold weather behavior of the finished fuel.



Team Members

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