

Production of long chain alkyl esters from carbon dioxide and electricity by a two-stage bacterial process - DTU Orbit (09/11/2017)

Production of long chain alkyl esters from carbon dioxide and electricity by a two-stage bacterial process

Microbial electrosynthesis (MES) is a promising technology for the reduction of carbon dioxide into value-added multicarbon molecules. In order to broaden the product profile of MES processes, we developed a two-stage process for microbial conversion of carbon dioxide and electricity into long chain alkyl esters. In the first stage, the carbon dioxide is reduced to organic compounds, mainly acetate, in a MES process by *Sporomusa ovata*. In the second stage, the liquid end-products of the MES process are converted to the final product by a second microorganism, *Acinetobacter baylyi* in an aerobic bioprocess. In this proof-of-principle study, we demonstrate for the first time the bacterial production of long alkyl esters (wax esters) from carbon dioxide and electricity as the sole sources of carbon and energy. The process holds potential for the efficient production of carbon-neutral chemicals or biofuels.

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