Towards sustainable biofuels

Christopher Humphreys and François Seys: SBRC – Nottingham

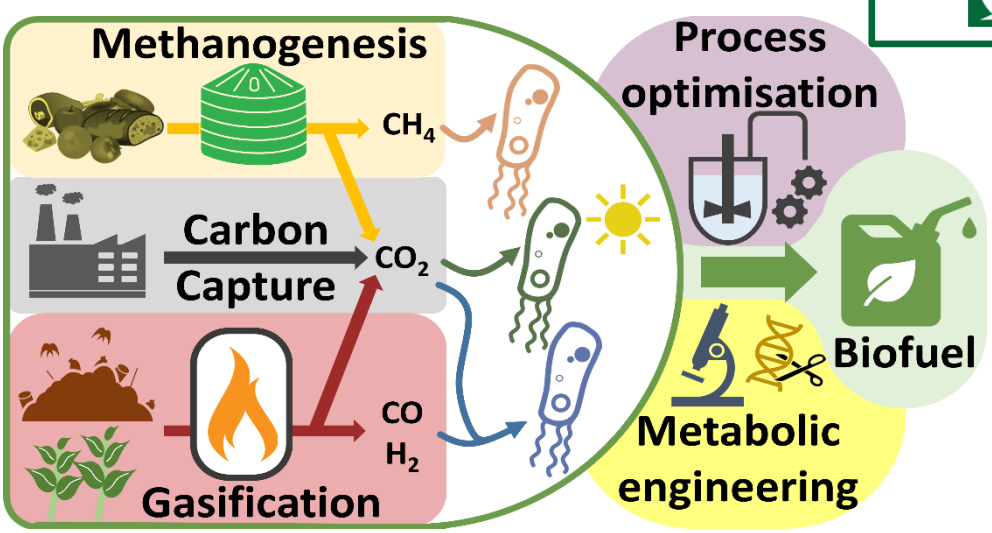
Fuels derived from biomass, or biofuels, have the potential to decarbonize sectors which cannot be electrified easily. Coupled with carbon capture technology, some of them could theoretically even become carbon negative. This still contested possibility is at the core of the strategies of both the EU and the UK to reach Net-zero CO_2 emissions. Biofuels are perhaps an even more important component of energy security: few countries possess oil fields, but all can grow the trees, crops, algae, yeasts and other microbes which are needed for biofuel production.

However, most biofuels commercially available today come with important trade-offs: they occupy valuable land and demand important resources, to the point that their carbon and broader ecological footprint is often questionable. Developing truly sustainable biofuels is thus an important challenge; both for the environment and for our energy security.

SBRC-NOTTINGHAM is a UKRI BBSRC/EPSRC funded, Synthetic Biology Research Centre led by Professor Nigel P. Minton at the University of Nottingham, UK. SBRC–Nottingham aims to provide new technologies in the form of engineered bacteria and processes that together can be used at scale by industry to transform our energy intensive economy into a sustainable and more carbon neutral bioeconomy. The Centre is collaborating with industry such as LanzaTech and Deep Branch to optimise and commercialise the production of low carbon fuels, everyday chemicals and animal feed using gas fermentation.

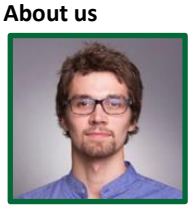
For more information visit:
https://sbrc-nottingham.ac.uk/

SynBio SBRC Nottingham
a BBSRC/EPSRC Synthetic Biology Research Centre



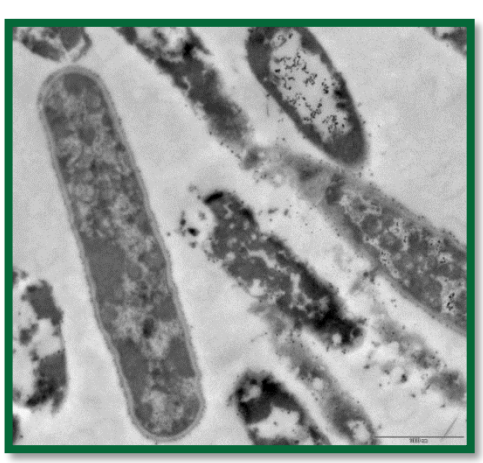
Synthetic Biology uses cutting-edge molecular techniques to engineer microorganisms (*e.g. Clostridia*) which can recycle waste carbon from industrial off-gas and landfill waste into biofuels or other useful chemicals. They can be grown in tanks which can be built almost anywhere and do not compete for land with agriculture. Methanotrophs help us capture the methane (CH_4) which would have otherwise been released from food waste in landfill, whereas autotrophic microorganisms fix carbon dioxide (CO_2) using either sunlight or hydrogen (H_2) as an energy source. These fascinating microbial factories enable the sustainable production of chemicals and fuels while consuming greenhouse gases. They are thus capable allies in our fight against climate change.

About us



François Seys *is a research associate at SBRC-Nottingham. His passion for sustainability and synthetic biology led him across Sweden, the USA, and finally in the UK to study next-generation biofuels and biomaterials. He is excited about the potential of gas fermenting organisms to accelerate the sustainability transition and to reduce our dangerous addiction to fossil resources.*

Christopher Humphreys *is a Senior Research Fellow at SBRC-Nottingham, who has studied in the field of Synthetic Biology and Gas fermentation for the last eight years. His focus is the engineering of microorganisms such that they can be applied to not only produce useful fuels and chemicals, but simultaneously reduce our carbon impact on the planet through the capture of GHG emissions.*



Clostridium autoethanogenum

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