Research Unit
Environmental Engineering and Biotechnology

SusBioTech

IP Sustainable Biotechnology and Bioeconomy
Lecture

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Tailored Microbial Consortia For Syngas Fermentation

Syngas is one of the most flexible feedstocks for biotechnological processes: it can be produced from any carbon-containing material including renewable biomass resources and wastes. Anaerobic microorganisms are able to utilize syngas, but the natural products of this conversion are generally limited to acetate and ethanol. At our research group, we aim at broadening the variety of products that can be produced from syngas by developing tailored anaerobic microbial consortia.
We established a co-culture of *Clostridium autoethanogenum*, a well-known carboxydotrophic acetogen, together with *Clostridium kluyveri*, a bacterium employing the reverse β-oxidation pathway. *C. autoethanogenum* uses syngas to produce a mixture of acetate and ethanol. *C. kluyveri* subsequently uses these products to perform chain elongation. This results in a co-culture producing a mixture of C4 and C6 fatty-acids and alcohols using syngas as a sole substrate. Currently we work on extending this concept to the production of odd-numbered fatty-acids and alcohols. Besides looking at the potential of biotechnological application of these cultures, it is also our aim to unravel the physiology and interspecies interactions of these co-cultures using e.g. transcriptomics and proteomics approaches.

Diana Z. Sousa graduated in Biological Engineering (University of Minho). She worked as a wastewater project engineer at Gerar, Porto (2001-2003). Her PhD research (University of Minho, 2007) focused on anaerobic lipid degradation. In the period 2007-2013 she worked as Assistant Professor at UMinho, and in 2013 she moved to the Laboratory of Microbiology, Wageningen University & Research. Since 2017 she is Associate Professor and group leader of the Microbial Physiology group at MIB-WUR. Her research goal is to use microbes and microbial networks as biocatalysts to obtain added-value products from renewable sources and with a focus on the conversion of C1 compounds.

All interested colleagues are kindly invited.