

## Moorella Strains for the Production of Biochemicals from Syngas

Redl, Stephanie Maria Anna; Jensen, Torbjørn Ølshøj; Nielsen, Alex Toftgaard

*Publication date:*  
2015

*Document Version*  
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

*Citation (APA):*

Redl, S., Jensen, T. Ø., & Nielsen, A. T. (2015). Moorella Strains for the Production of Biochemicals from Syngas. Abstract from The 7th Copenhagen Bioscience Conference, Hillerød, Denmark.

## DTU Library

Technical Information Center of Denmark

---

### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.



COPENHAGEN  
BIOSCIENCE  
CONFERENCES

## Cell Factories & Biosustainability 2015

# *Moorella* Strains for the Production of Biochemicals from Syngas

Stephanie Redl, Torbjørn Ølshøj Jensen, Alex Toftgaard Nielsen

The Novo Nordisk Foundation Center for Biosustainability

In the process of sugar fermentation, a significant portion of lignocellulosic biomass is left unused. An alternative is the gasification into syngas, a carbon-rich gas mixture. Syngas serves as energy and carbon source for acetogenic bacteria, which can then produce biochemicals. In the syngas fermentation process even the recalcitrant lignin portion can be fully converted into higher value compounds.

Still the cost-effectiveness of this process requires better understanding of the metabolism and modification of the acetogenic strains. In my PhD project I am laying the basis for production of higher value biochemicals (acetone) from syngas using *Moorella* strains as cell factories. *Moorella* has outstanding abilities that make it especially suitable for the syngas fermentation process (thermophily, carbon source utilization). Firstly, the project focuses on understanding the primary metabolism in acetogenic bacteria. The main research aspect is to determine acceptance of, and the exact growth rates on different carbon sources (C1, C6, gaseous substrates) in different *Moorella* strains. Genome analysis on pathway level is performed to link the genotype to the phenotype. Differential expression analysis between heterotrophic and autotrophic growth (RNA-seq) serves to elucidate the regulatory mechanisms underlying carbon source utilization.

In the second part of my project I am developing tools for genetic manipulation of *Moorella* strains. For example, a *pyrF* deletion strains, which allows heterologous gene expression was constructed. These tools developed in my project will be applied to engineer bacterial cell factories for production of higher value biochemicals like acetone.