

Technical University of Denmark



## Consortia based production of biochemicals

**Ingemann Jensen, Sheila; Sukumara, Sumesh; Özdemir, Emre; Schneider, Konstantin; Li, Songyan ; Calero Valdayo, Patricia Maria; Ronda, Carlotta; Nielsen, Alex Toftgaard**

*Published in:*

Programme & Abstracts. The Danish Microbiological Society Annual Congress 2016

*Publication date:*

2016

*Document Version*

Peer reviewed version

[Link back to DTU Orbit](#)

*Citation (APA):*

Ingemann Jensen, S., Sukumara, S., Özdemir, E., Schneider, K., Li, . S., Calero Valdayo, P., ... Nielsen, A. T. (2016). Consortia based production of biochemicals. In Programme & Abstracts. The Danish Microbiological Society Annual Congress 2016 (pp. 84-85). Danish Microbiological Society.

## 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.

## Consortia based production of biochemicals.

**Jensen SI\***, Sukumara S, Özdemir E, Schneider K, Calero P, Li S, Ronda C, Nielsen AT.  
DTU Biosustain, The Novo Nordisk Foundation Center for Biosustainability,

\*Presenting author: Sheila Ingemann Jensen. E-mail: [shin@biosustain.dtu.dk](mailto:shin@biosustain.dtu.dk)

One of the great challenges facing society is how to sustainably produce food, chemicals and other commodities required to maintain and develop our current life style. To compete with and ultimately replace existing petrochemical-based manufacturing processes, the development of innovative and effective solutions is needed. In this project we have explored the possibility of using designed consortiums for the covalorization of the main carbon sources in lignocellulosic biomass (xylose, glucose, arabinose, and acetic acid). In one study we have used pre-processing simulations, constraint-based modelling, and state-of-the art metabolic engineering tools to develop a consortium of cells capable of efficient valorization of synthetic hemicellulosic hydrolysate. Stable co-existence and effective covalorization was achieved through niche-differentiation, auxotrophy, and adaptive evolution. In another study, stable consortia based fermentation was achieved through niche partitioning, syntrophy (auxotrophy combined with removal of inhibitory side product), and CRISPRi mediated gene silencing. The achieved results demonstrate that consortium based approaches for valorizing complex biomass and waste related carbon sources can be an attractive alternative to the design of a so-called “superbug” and can thereby add significant value to biorefineries.