



## Small Sensors Go Big: Towards High-Resolution Monitoring of Industrial Fermentations

Junicke, Helena; Semenova, Daria; Silina, Yuliya; Koch, Markus; Flores-Alsina, Xavier; Gernaey, Krist V.

*Publication date:*  
2019

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

[Link back to DTU Orbit](#)

*Citation (APA):*

Junicke, H., Semenova, D., Silina, Y., Koch, M., Flores-Alsina, X., & Gernaey, K. V. (2019). Small Sensors Go Big: Towards High-Resolution Monitoring of Industrial Fermentations. Abstract from BioDetection and BioSensors Summit 2019 , San Diego, United States.

---

### 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.

Conference title:  
Biodetection & Biosensors Summit 2019

Conference scope:  
International

Conference date:  
1-2 April 2019

Conference place:  
Coronado Island, San Diego, CA, USA

Conference URL:  
<https://selectbiosciences.com/conferences/agendaAbstracts.aspx?conf=biosensorsummit2019&AbstractID=18997>

Title of talk:  
Small Sensors Go Big: Towards High-Resolution Monitoring of Industrial Fermentations

Authors:

Dr. Helena Junicke, Technical University of Denmark  
Dr. Daria Semenova, Technical University of Denmark  
Dr. Yuliya Silina, Leibniz Institute for New Materials, Saarbrücken, Germany  
Dr. Markus Koch, Leibniz Institute for New Materials, Saarbrücken, Germany  
Dr. Xavier Flores-Alsina, Technical University of Denmark  
Prof. Dr. Krist V. Gernaey, Technical University of Denmark

Abstract:

Miniaturized sensors are shaping new opportunities for bio-based manufacturing. Whether food, pharma or chemical production, fermentation processes form an integral part of many key industries and face high demand in this growing bioeconomy. However, monitoring and control of bioprocesses remain challenging tasks due to the limitations of current measurement devices. Concentration gradients, for example, are typical phenomena in large-scale industrial fermentations and can lead to substantial performance losses. Such conditions go unnoticed by local sampling campaigns using standard analytical probes. Microfabricated sensors allow an improved spatial surveillance of production units with sensors located in several critical locations, and even with freely floating sensors in the fermentation broth. These sensors provide continuous on-line data regarding key metabolites and empower plant operators to obtain an all-round view of the fermentation conditions. This is only a small step away from data-driven control decisions and efficient error forecasting. GreenLogic is a research initiative exploring the application potential of biosensors for butanol production, a next-generation biofuel with properties similar to gasoline. In this frame, the authors will report on a novel enzyme-based sensor for butanol quantification and discuss sensor requirements for industrial diagnostic systems. Sensor applications for high-throughput process design will also be addressed.