Institut für Biotechnologie
Technische Universität Berlin
Bioverfahrenstechnik

Bio-PAT

IfGB
Institut für Gärungsgewerbe und Biotechnologie zu Berlin

6th BioProScale Symposium

Three-day online symposium about industrial scale bioprocess intensification from process development to large-scale understanding

Scale-up and scale-down for accelerated bioprocess development and optimisation

ONLINE EVENT

29 TO 31 MARCH 2021, ONLINE EVENT

REGISTRATION: WWW.BIOTECHNOLOGIE.IFGB.DE/BIOPROSCALE2021

www.bioproscale-conference.org

VENUE: VLB VIRTUAL CAMPUS (ONLINE EVENT)

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MONDAY, 29 MARCH 2021

WELCOME ADDRESS AND INTRODUCTION

10:00	**Welcome address and introduction** *Peter Neubauer,* *Department of Bioprocess Engineering, TU Berlin, Germany*
10:20	**Plenary talk: Zero concepts in bioprocessing – towards the ultimate performance** *Henk Norman, DSM, The Netherlands*
11:05	*Coffee break*

SESSION 1A

Chair	N.N.
11:35	**Keynote talk: Digital twins for improved bioprocess operation?** *Krist V. Gernaey, Technical University of Denmark, Denmark*
12:05	**Towards increased stability in large-scale bioreactors by bacterial co-cultures** *Pauli Losoi, Tampere University, Finland*
12:25	**Dynamic genome scale modeling of Streptomyces clavuligerus metabolism for studying ist metabolic performance under different shear stress conditions** *David Gómez-Rios, Universidad de Antioquia, Colombia*
12:45	*Lunch break, poster session and exhibition*

SESSION 1B

Chair	N.N.
11:35	**Keynote talk: Interfacing single cell technologies for stabilizing microbial cell population incontinuos cultivation** *Frank Delvigne, Université de Liège, Belgium*
12:05	**Continuous E. coli bioprocessing: Monitoring of subpopulations and how to deal with them** *Julian Kopp, TU Wien, Austria*
12:25	**What is beyond the average - a step toward quantifying the specific reactivity of single cells?** *Martin Schirmer, University Leipzig, Germany*
12:45	*Lunch break, poster session and exhibition*

SESSION 2A

Chair	N.N.
14:30	**Keynote talk: N.N.** *Michael Schlüter, TU Hamburg, Germany*
15:00	**CFD-based dynamic compartment modelling for the time-series prediction of gradients in industrial-scale aerobic fed-batch fermentation processes** *Gisela Nadal Rey, Technical University of Denmark, Denmark*
15:20	**Heat balance and CFD coupling strategy for the scale-up of an innovative bioleaching process** *Céline Loubiere, Bureau de Recherches Géologiques et Minières, Orléans, France*
15:40	**CFD shows mass transfer is not limiting industrial syngas conversion** *Lars Puiman, Delft University of Technology, The Netherlands*
16:00	*Coffee break*
16:30	*Poster session, exhibition and get-together*

SESSION 2B

Chair	N.N.
14:30	**Keynote talk: PAT for the assessment of population heterogeneity in scale up and down** *Stefan Junne, TU Berlin, Germany*
15:00	**In-line application of Photon Density Wave spectroscopy as a PAT sensor in high-cell-density bioprocesses: Monitoring of E. coli growth and PHA formation in R. eutropha** *Björn Gutschmann, TU Berlin, Germany* *Thomas Schiewe, Physikalische Chemie Universität Potsdam / innoFSPEC, Germany*
15:20	**Design and development of electrochemical sensors for bioprocess monitoring** *Aliyeh Hasanzadeh, Technical University of Denmark, Denmark*
15:40	**Control and optimization of polyhydroxyalkanoates production at pilot plant scale in real-time** *Silvia Ochoa, Universidad de Antioquia, Colombia*
16:00	*Coffee break*
16:30	*Poster session, exhibition and get-together*

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TUESDAY, 30 MARCH 2021

WELCOME ADDRESS AND INTRODUCTION

10:00	**Welcome address and introduction** *Peter Neubauer,* *Department of Bioprocess Engineering, TU Berlin, Germany*
10:05	**Plenary talk: Systematic bioprocess devlopment in advanced microtiter plate and shake flask culture systems with online monitoring and feeding options** *Jochen Büchs, RWTH Aachen, Germany*
10:50	*Coffee break*

SESSION 3A

Chair N.N.

11:20	**Keynote talk: Predicting large scale performance a priori using data-driven Euler-Lagrangian simulations** *Ralf Takors, University of Stuttgart, Germany*
11:50	**Investigation of scale dependent factors in industrial human milk oligosaccharide production** *Greta Gecse, DTU Bioengineering, Kgs. Lyngby, Denmark*
12:10	**Secretory protein producing Bacillus subtilis: Withstanding process inhomogeneities expected in a large-scale stirred tank bioreactor** *Anne Hütterott, Forschungszentrum Jülich, Germany*
12:30	*Lunch break, poster session and exhibition*

SESSION 3B

Chair N.N.

11:20	**Keynote talk: Feedstock potential and valorisation of organic side-streams for value-added products** *Saija Rasi, Natural Resources Institue Finland, Finland*
11:50	**Scale up from the cellar - the LX-Process as pretreatment for microbial conversion** *Friedrich Streffer, LXP Group GmbH, Teltow, Germany*
12:10	**Upscaling butanol production using mixed microbial cultures** *Tiago Pinto, Technical University of Denmark, Denmark*
12:30	*Lunch break, poster session and exhibition*

SESSION 4A

Chair N.N.

14:30	**Keynote talk: Vitreoscilla hemoglobin expression to improve aerobic processes** *Alvaro R. Lara, Universidad Autonoma Metropolitana-Cuajimalpa, Mexico*
15:00	**Scale-down of high cell density Fab production in E. coli** *Florian Mayer, University of Natural Resources and Life Sciences, Vienna, Austria*
15:20	**N-1 perfusion-based IgG productions in stirred single-use bioreactors** *Jan Müller, Zurich University of Applied Sciences, Switzerland*
15:40	**Evaluation of the clavulanic acid production integrating process simulation and systems biology** *Rigoberto Rios Estepa, Universidad de Antioquia, Colombia*
16:30	*Coffee break, Poster session, Exhibition and get-together*

SESSION 4B

Chair N.N.

14:30	**Keynote talk: High-throughput single-cell-resolution microfluidics to accelerate microbial bioproduction bioprocess development** *Arum Han, Texas A&M University, USA*
15:00	**Seperation of microalgae and polystyrene particles by dielectrophoresis** *Danai Malti, TU Berlin, Germany*
15:20	**Dynamic microfluidic single-cell cultivation: Growth of Corynebacterium glutamicum at fluctuating environmental conditions** *Sarah Täuber, Bielefeld University, Germany*
15:40	**Reproducing dynamic environment in microfluidic single-cell cultivation based on computational lifeline analysis** *Phuong Ho, Forschungszentrum Jülich, Germany*
16:30	*Coffee break, Poster session, Exhibition and get-together*

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WEDNESDAY, 31 MARCH 2021

WELCOME ADDRESS AND INTRODUCTION

10:00	**Welcome address and introduction** *Peter Neubauer,* *Department of Bioprocess Engineering, TU Berlin, Germany*
10:05	**Plenary Talk: Digitalization platform and supervisory control for continuous integrated manufacture of monoclonal antibodies** *Massimo Morbidelli, Politecnico di Milano, Italy*
10:50	*Coffee break*

SESSION 5A

Chair	N.N.
11:20	**Keynote talk: The CompuGene automated platform for the construction and characterization of genetic parts and microbial cell factories** *Jonathan Cheron, Université de Lorraine, France*
11:50	**Towards accelerated bioprocess development: Using cell-free protein synthesis to screen for promising biocatalysts** *Katrin Rosenthal, TU Dortmund, Germany*
12:10	**Fed-batch like microtiter cultivations as high-throughput screening tool for E. coli production process development** *Mathias Fink, Boehringer Ingelheim, Vienna, Austria*
12:35	*Lunch break, poster session and exhibition*

SESSION 5B

Chair	N.N.
11:20	**Keynote talk: Improvements for scalability of Lagrangian-Eulerian approaches for tracking lifelines of single cells in large bioreactors** *Matthias Reuss, University of Stuttgart, Germany*
11:50	**Black box modelling approaches to judge a yeast extracts influence on microbial growth and production** *Stefanie Kaul, Hamburg University of Applied Sciences, Germany*
12:10	**On the modelling of microbial population dynamics using partial differential equations** *Jerome Morchain, Toulouse Biotechnology Institute, France*
12.35	*Lunch break, poster session and exhibition*

SESSION 6A:

Chair	N.N.
14:30	**Keynote talk: Smart digital solutions for USP and DSP to master bioengineering challenges towards industry 4.0 in biopharma** *Michael Sokolov, DataHow / ETH Zürich, Switzerland*
15:00	**Robot and machine learning assisted protein engineering on the high-throughput screening platform LARA** *Mark Dörr, University Greifswald, Germany*
15:30	**Modelling approaches with a fully-automated microbial fermentation platform** *Vignesh Rajamanickam, Boehringer Ingelheim, Vienna, Austria*
15:50	**Towards an autonomous model based high throughput bioprocess development and clone discrimination** *Sebastian Hans, TU Berlin, Germany*
16:10	*Coffee break*
16:30	**Plenary talk: Integrated and Networked Systems and Processes – A Perspective for Digital Transformation in (Bio) Process Engineering** *Michael Maiwald, BAM, Germany*

SESSION 6B:

Chair	N.N.
14:30	**Keynote talk: Usage of mealworms to recover and purify polyhydroxyalkanoate granules from Cupriavidus necator cells** *Kumar Sudesh, Universiti Sains Malaysia, Malaysia*
15:00	**Process development of polyhydroxyalkanoate (PHA) bioplastics production from lipid based waste and raw materials** *Sebastian Riedel, TU Berlin, Germany*
15:20	**Extraction of chitin from American lobster (Homarus americanus) shells and fabrication of membranes for potential biomedical use** *Christopher Brigham, Wentworth Institute of Technology, USA*
15:40	**Low quality by-products for high quality products - Processing strategy and application development for the circular economy** *Thomas Grimm, Animox GmbH, Germany*
16:10	*Coffee break*

17:15	**Closing remarks** *Peter Neubauer,* *Department of Bioprocess Engineering, TU Berlin, Germany*

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