2nd BioProScale Symposium

# Inhomogeneities in large-scale bioprocesses

## System biology and process dynamics

14 to 16 March 2012
Berlin – Germany

Three-day symposium about development and application of bioprocesses in industrial scale

## ■ Focus: Biosystems

Cellular stress responses

Metabolic adaptation

Population dynamics

Analytical tools and modelling

Early booking discount until 31st January

## ■ Focus: Bioreactor environment

Large-scale bioprocess characterisation

Bioprocess scale down: Systems, sensors, industrial relevance

Scale up: Consistent bioprocess development considering large-scale reality in industrial systems

Language: English

www.ifgb.de/bioproscale

Department for Bioprocess Technology

IfGB

Institute for Biotechnology and Fermentation in Berlin

In cooperation with

BIO PROSCALE network

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2nd BioProScale Symposium – Announcement

# Inhomogeneities in large-scale bioreactors

## System biology and process dynamics

### Organisers

Technische Universität Berlin –
Department of Bioprocess Technology &
Institute for Biotechnology and Fermentation in Berlin (IfGB)

### Conference days

14 to 16 March 2012 (Wed - Fri)

### Location

TU Berlin, Institute for Chemistry, Lecture hall C130
Strasse des 17. Juni 115, D-10623 Berlin (Charlottenburg), Germany

### Language

Congress language is Englisch. No translation will be provided.

### Target groups

Producers of biogas and enzymes, antibiotic production, bioprocess development, pharmaceutical bioprocesses, brewery processes – experts from research & development and industrial practice

### Aim

Consistent bioprocess development needs to be performed at the perspective of the final process scale. As a result a better understanding of the final industrial scale is an important issue, which includes technical challenges (sensors, modelling tools) and the cellular dynamic regulatory networks and population dynamics.

The 2nd BioProScale Symposium aims to discuss progresses and challenges in the different scientific disciplines. It summarises the current state of knowledge in relation to our understanding of processes in large scale bioreactors for different bio products. The symposium covers related applications starting from food production, white biotechnology and bio based energy/biorefinery processes up to the field of biopharmaceutical production.

### Confirmed presentations

**Prof. Matthias Reuss** (Univ. Stuttgart):
Lifelines of single cells and populations in large scale bioreactors – Complex dynamic interplay between extracellular environment and cell machinery

**Prof. Christopher J. Hewitt** (Biological Engineering, Loughborough University):
Physiological heterogeneity and population dynamics in microbial cultures

**Prof. Octavio T. Ramirez** (Instituto de Biotecnlogica, UNAM, Mexico):
Consistent bioprocess development and scaling

**Dr. Joachim Venus** (ATB Potsdam, Germany):
Scale up of Lactic acid production

**Thomas Schweder** (Ernst-Moritz-Arndt-Universität Greifswald, Germany):
Bioprocess monitoring by marker gene analysis

**Michael Klocke** (Leibniz-Institut für Agrartechnik Potsdam-Bornim e.V. (ATB), Potsdam, Germany):
Population composition and dynamics in biogas reactors

### Poster session

The symposium will be accompanied by poster session. Please submit your abstract online at www.ifgb.de/bioproscale

**The Call for Papers / Posters is still open!**

### Scientific Advisory Board

Dr. Henk Noorman (DSM)

Prof. Octavio T. Ramirez
(Instituto de Biotecnlogica, UNAM, Mexico)

Prof. Matthias Reuss (Univ. Stuttgart)

Prof. Dr. Nico Oosterhuis (Cellution Biotech)

Andreas Lübbert (Institute of Biochemistry and Biotechnology, Martin-Luther-University Halle-Wittenberg)

Dr. Marco Jenzsch
(Roche Diagnostics, Penzberg, Germany)

### Exhibition

The symposium will be accompanied by an exihibition. More information on www.ifgb.de/bioproscale

### Contact

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**Information & registration**
www.ifgb.de/bioproscale

**www.ifgb.de/bioproscale**

# 2nd BioProScale Symposium "Inhomogeneities in large-scale bioprocesses: System biology and process dynamics"

## Wednesday, 14 March 2012

13:00 **Welcome address**
Peter Neubauer (Department of Bioprocess Engineering, TU Berlin, Germany)

13:15 **Opening Lecture**
Chair: Peter Neubauer (TU Berlin)

**Lifelines of single cells and populations in large scale bioreactors – Complex dynamic interplay between extracellular environment and cell machinery** (L01)
Matthias Reuss (University of Stuttgart, Germany)

### Biosystems

Chair: Henk Noorman (DSM), Stefan Junne (TU Berlin)

14:00 **Physiological heterogeneity and population dynamics in microbial cultures** (L02)
Chris Hewitt (Loughborough University, United Kingdom)

14:40 Coffee break with poster session and exhibition

15:10 **Key note lecture: Population composition and dynamics in biogas reactors** (L03)
Edith Nettmann, Antje Rademacher, Kathrin Heeg, Michael Klocke (Leibniz-Institut für Agrartechnik Potsdam-Bornim e.V. (ATB), Germany)

15:40 **Reduced overflow of acetate in Escherichia coli by gene engineering and media design** (L04)
Kaarel Adamberg, Kaspar Valgepea, Ranno Nahku, Petri-Jaan Lahtvee, Liisa Arike, Sten Erm, Raivo Vilu (Tallinn University of Technology and CCFFT, Estonia)

16:05 **Tuning protein production at level of translation** (L05)
Zoya Ignatova (University of Potsdam, Germany)

16:30 **Oscillatory feeding triggers protein release in Escherichia coli** (L06)
Mohammedhadi Jazini, Christoph Herwig (Vienna University of Technology, Austria)

16:55 Coffee break with poster session and exhibition

17:10 **Synthesis of non-proteinogenic amino acid species in recombinant Escherichia coli fermentation – Looking for strain dependent differences** (L07)
Michael Biermann, Uwe Horn (Hans-Knöll Institut, Jena, Germany), Guido Seidel (Wacker Biotechnologie, Jena, Germany)

17:35 **Effects of oxygen transfer limitation and inhomogeneous supply in Corynebacterium glutamicum** (L08)
Friedrich Käss, Marco Oldiges (Forschungszentrum Jülich, Germany)

18:00 **Effect of intensity and frequency of glucose pulse perturbations on transient E. coli behavior: A step toward the large scale bioreactor** (L09)
Sirichai Sunya, Jean-Louis Uribelarrea, Carole Molina-Jouve, Nathalie Gorret (Université de Toulouse, INRA, CNRS, France), Frank Delvigne (University of Liege, Belgium)

18:25 **The dynamics of the branched chain amino acid synthesis in Escherichia coli in a two-compartment reactor** (L10)
Stefan Junne, Eva Brand, Dennis Runge, Martin Baudis, Peter Neubauer (TU Berlin, Germany)

18:50 **Distinguished lecture: Engineering of the genetic code as a biosafety strategy in the industrially relevant bio-production?** (L11)
Nediljko Budisa (TU Berlin, Germany)

19:30 **Poster session, Exhibition and Welcome Reception**

21:30 End

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## Thursday, 15 March 2012

### Biosystems

Chair: Matthias Reuss (University of Stuttgart), Peter Neubauer (TU Berlin)

9:00 **Key note lecture: Bioprocess monitoring by marker gene analysis** (L12)
Thomas Schweder (Ernst-Moritz-Arndt Universität Greifswald, Germany)

9:40 **Elaboration of a mini scale-down platform on the basis of the response of GFP microbial biosensors responsive to a substrate limitation: Detection of substrate heterogeneities at the single cell level and assessment of microbial viability** (L13)
Alison Brognaux, Philippe Thonart, Frank Delvigne (Université de Liège, Belgium), Peter Neubauer (TU Berlin), Jean-Claude Twizere

10:05 **Microthrix parvicella and Cloacamonas acidaminovorans: Indicator organisms for foam formation in large-scale biogas plants?** (L14)
Tobias Lienen (Helmholtz-Zentrum Potsdam Deutsches GeoForschungsZentrum GFZ, Germany)

10:30 **Evaluation of evolved xylose fermenting strains for bioethanol production - Comparison of single cells and mixed populations** (L15)
Elia Tomas-Pejo, Lisbeth Olsson (Chalmers University of Technology, Sweden)

10:55 Coffee break and poster session and exhibition

11:25 **Systematic process development from microscale to pilot production at the example of a production of heterologeous ribonuclease inhibitor in E. coli** (L16)
Juozas Siurkus (Thermo Fisher Scientific (formerly Fermentas), Lithuania), Peter Neubauer (TU Berlin, Germany)

11:50 **Engineering E. coli to increase plasmid DNA production in high cell-density cultivations in batch mode** (L17)
Alvaro R. Lara (Universidad Autónoma Metropolitana-Cuajimalpa, México)

12:30 Lunch break, poster session and exhibition

### Bioreactor environment

Chair: Octavio Ramirez (Instituto de Biotecnologica, UNAM), Thomas Schweder (Ernst-Moritz-Arndt Universität Greifswald)

14:00 **Key note lecture: Scale up of lactic acid production** (L18)
Joachim Venus (Leibniz-Institut für Agrartechnik Potsdam-Bornim e.V. (ATB), Germany)

14:40 **Generic methods for scale up of bioprocesses based on quality-by-design (QbD) principles** (L19)
Christoph Herwig (Vienna University of Technology, Austria)

15:15 **Shaken bioreactors with culture volumes of 0.1 ml to 200 liter: Effects of scale, vessel geometry and shaking parameters on kLa values, mixing times and hydrodynamics** (L20)
Wouter Duetz (Enzyscreen B.V., The Netherlands), Tibor Anderlei, Markus Kühner (Kühner AG, Switzerland)

15:50 **Physiological impacts of mixing at the docosahexaenoic acid production process with the heterotrophic marine microalgae Crypthecodinium cohnii** (L21)
Friederike Hillig, Stefan Jahns, Stefan Junne, Peter Neubauer (TU Berlin, Germany)

16:15 Coffee break and poster session and exhibition

16:30 **Design of a scalable single-use bioreactor** (L22)
Nico M.G. Oosterhuis, Anton Tromper (Cellution Biotech B.V., The Netherlands), Stefan Junne, Peter Neubauer (TU Berlin, Germany)

16:55 **Towards a complete single-use upstream process for an Escherichia coli high cell density fermentations** (L23)

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Thomas Dreher, C. Zahnow, U. Husemann, G.Greller (Sartorius-Stedim, Germany)

17:20 **Decreasing the uncertainty when increasing the scale** (L24)
Wouter van Winden, Rogier Meulenberg, Sybe Hartmans (DSM Biotechnology Center, The Netherands)

17:50 **Insitu Biocell Vitality Analyzer – the on-line bridge to flow cytometry** (L25)
Friedel H. Schwartz (Sequip S + E GmbH, Germany)

18:10 **EnBase - a solution for fed-batch conditions during process development** (L26)
Antje Neubauer (BioSilta Europe GmbH, Germany)

19:30 Conference dinner

## Friday, 16 March 2012

### Bioreactor environment

Chair: Nico Oosterhuis (Cellution Biotech), Kathrin Ralla (TU Berlin)

9:00 **Key note lecture: Consistent bioprocess development and scaling** (L27)
Octavio T. Ramirez (Universidad Nacional Autónoma de México, México)

9:40 **Scale-down of penicillin production in Penicillium chrysogenum** (L28)
Walter van Gulik (Delft University of Technology, The Netherlands)

10:10 **Development of a scale-down model of hydrodynamic stress to study the performance of an industrial CHO cell line under simulated production scale bioreactor conditions** (L29)
Jochen Sieck (Novartis Pharma AG, Switzerland)

10:35 **Scale-down model of the inactivated Polio Vaccine production process: Unit operation cell and virus culture** (L30)
Yvonne E. Thomassen, Leo A. van der Pol, Wilfried A.M. Bakker (RIVM, The Netherlands)

11:00 Coffee break with poster session and exhibition

11:30 **Are classical correlations suitable for high performance lab scale bioreactors?** (L31)
Sebastian Schaepe, Andreas Lübbert (Martin-Luther-Universität Halle-Wittenberg, Germany), Artur Kuprijanov, Rimvydas Simutis (Kaunas Technical University, Lithuania)

11:55 **Evaluation of process integration opportunities using process simulation and scheduling tools** (L32)
Jose Oscar Jimenez (Intelligen B.V., The Netherlands)

12:20 Lunch break with poster session and exhibition

13:30 **Bacteriophage contamination in bacterial fermentation as an important cause of fermentation failures** (L33)
Marcin Los, Piotr Golec, Joanna M. Los, Grzegorz Wegrzyn (University of Gdansk, Poland)

13:55 **High throughput cultivation of recombinant Escherichia coli in microtiter plates** (L34)
Csilla Török (Austrian Centre of Industrial Biotechnology, Vienna), Monika Cserjan, Gerald Striedner (Austrian Centre of Industrial Biotechnology / University of Natural Resources and Applied Life Sciences, Vienna)

14:20 **Picoliter bioreactors for growth heterogeneity studies of industrial bacteria on single cell level** (L35)
Alexander Grünberger (FZ Jülich, IBG-1: Biotechnologie, Germany)

14:45 **Concluding remarks**
Peter Neubauer (TU Berlin, Germany)

15:00 End of symposium

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# Contact

## Concept & Programme

Technische Universität Berlin
Institute for Biotechnology
Chair for Bioprocess Engineering

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## Exhibition & Sponsoring

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Congress Management

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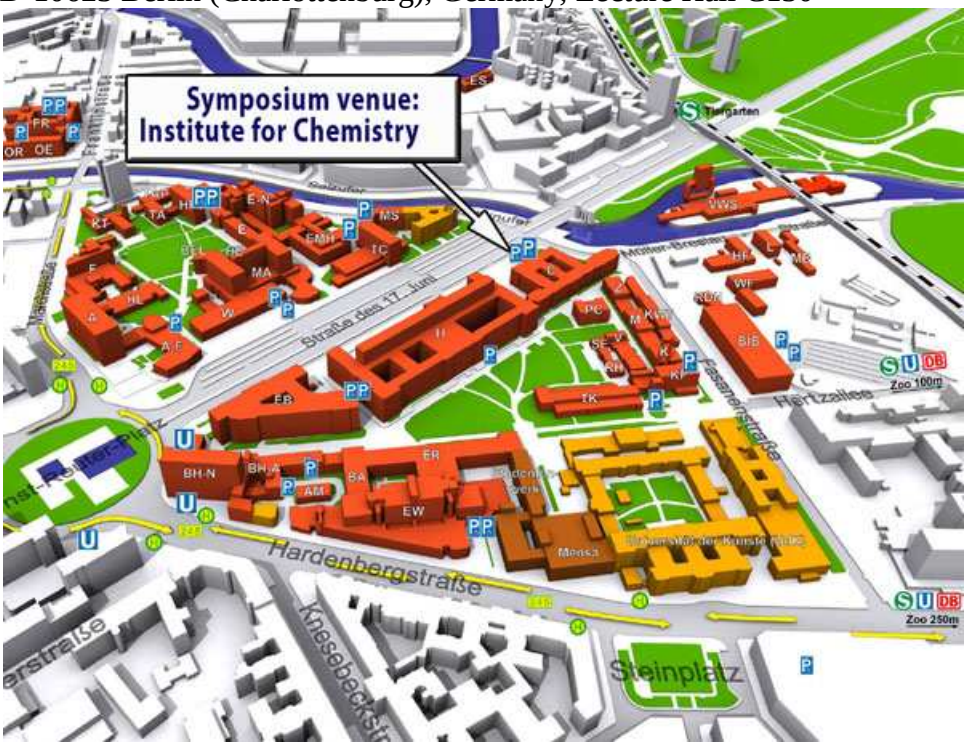
# Venue

**Technische Universität Berlin,** Institute for Chemistry, Strasse des 17. Juni 115, D-10623 Berlin (Charlottenburg), Germany, Lecture Hall C130




Online registration:
http://www.ifgb.de/ifgbcms/biotechnologie/front_content.php?idcat=14&idart=49&registration=1&lang=4

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