CONFERENCE PROGRAMME

Sunday, 23rd April 2017

16:30 – 18:30  Registration
18:30 – 18:45  Opening ceremony
18:45 – 19:45  Opening lecture
   Engineering platforms of micro- and extended nano-fluidics
   Takehiko Kitamori
   The University of Tokyo, Japan
   Chair
   Polona Žnidaršič Plazl, University of Ljubljana, Slovenia
   Bruno Zelić, University of Zagreb, Croatia

20:00  Welcome party

Monday, 24th April 2017

8:00 – 9:00  Registration
9:00 – 9:55  Plenary talk
   Flow chemistry @ the chemistry & biology interface
   Marko Mihovilovic
   Technical University Vienna, Austria
   Chair
   László Poppe, Budapest University of Technology and Economics, Hungary

Session
ENZYMATIC MICROREACTORS
Chair
Roland Wohlgemuth, Sigma-Aldrich, Switzerland
Stefano Servi, Politecnico di Milano, Italy

10:00 – 10:30  Keynote lecture
   Thermophilic proteins and their applications in microreactors for Industrial
   Biocatalysis
   Jennifer Littlechild
   University of Exeter, United Kingdom

10:30 – 10:50  Reaction design for the compartmented combination of heterogeneous and enzyme
   catalysis
   Josef M. Sperl, Jörg M. Carsten, Jan-Karl Guterl, Petra Lommes, Volker Sieber
   Technical University of Munich, Germany; TUM Catalysis Research Center, Germany

10:50 – 11:20  Coffee break
11:20 – 11:40  Continuous-flow dynamic kinetic resolution of amines and amino acids in microreactor setups
Márk Oláh, Attila J. Földi, Gábor Hornyánszky, László Poppe
Budapest University of Technology and Economics, Hungary; SynBiocat LLC, Hungary; Babeș-Bolyai University of Cluj-Napoca, Romania

11:40 – 12:00  Overcoming the challenges of cascading enzymatic microreactors
Pia Gruber, Marco P.C. Marques, Roland Wohlgemuth, Torsten Mayr, Frank Baganz, Nicolas Szita
University College London, United Kingdom; Graz University of Technology, Austria; Sigma–Aldrich, Switzerland

12:00 – 12:20  Characterization of single-microbeads as isolated microreactors for heterogeneous biocatalysis
Ana I. Benítez-Mateos, Susana Velasco-Lozano, Juan M. Bolivar, Fernando López-Gallego
CIC biomaGUNE, Spain; Graz University of Technology, Austria; Ikerbasque - Basque Foundation for Science, Spain

12:20 – 12:40  Wall-coated biocatalytic microreactors for bioprocess intensification: opportunities and challenges
Juan M. Bolivar, Donya Valikhani, Marco A. Tribulato, Sabine Schelch, Bernd Nidetzky
Graz University of Technology, Austria

12:40 – 13:00  Theoretical and experimental study of surface enzyme kinetics in the microreactor system with immobilized ω-transaminase
Natasa Milozic, Martin Lubej, Mitja Lakner, Polona Znidaric Plazl, Igor Plazl
University of Ljubljana, Slovenia

13:00 – 14:30  Lunch

Session  CELLS WITHIN MICRODEVICES
Chair  Rainer Krull, Technical University Braunschweig, Germany

14:30 – 15:00  Keynote lecture
Parallel shaken bioreactor systems with advanced on-line measuring techniques partially replace lab-scale stirred tank bioreactors
Jochen Büchs
RWTH Aachen University, Germany

15:00 – 15:20  Microbial single-cell analysis inside picoliter batch-cultivation chambers
Eugen Kaganovitch, Xenia Steurer, Christopher Probst, Wolfgang Wiechert, Dietrich Kohlheyer
Research Center Jülich, Germany; RWTH Aachen University, Germany

15:20 – 15:40  Influence of scaffold microtexturing on cell cultures
Elisabetta Dattola, Tania Limongi, Patrizio Candeloro, Maria Laura Coluccio, Ernesto Lamanna, Enzo Di Fabrizio, Gerardo Perozziello
University of Magna Graecia, Italy; King Abdullah University of Science and Technology, Saudi Arabia

15:40 – 16:00  Novel electrospun magnetized 3D nanofibers in microbioreactors: application to cell-based therapy
Maria H. Ribeiro, Monica Guerra, Samuel Martins; Fábio Garrudo
Universidade de Lisboa, Portugal
16:00 – 16:30  Coffee break

16:30 – 16:50  *Multiphase microreactors with intensification of oxygen mass transfer rate and mixing performance for bioprocess development*
*Susanna Lladó Maldonado,* Jana Krull, Detlev Rasch, Alice Kasjanow, Dominique Bouwes, Ulrich Krühne, Rainer Krull
Technical University Braunschweig, Germany; Micronit GmbH, Germany; Technical University of Denmark, Denmark

16:50 – 17:10  *Guiding efficient bioprocess development: one-step microbial synthesis of ε-caprolactone from cyclohexane*
*Rohan Karande,* Andreas Schmid, Katja Buehler
Helmholtz-Centre for Environmental Research, Germany

17:10 – 17:30  *Miniaturized microbial fuel cell utilizing carbohydrate substrates*
*Pavel Hasal,* Zuzana Nováková, Michal Opletal, Walter Schrott, Michal Příbyl
University of Chemistry and Technology, Prague, Czech Republic

### Poster spotlights

**Chair**  
*Adama Marie Sesay,* University of Oulu, Finland  
*Ulrich Krühne,* Technical University of Denmark, Denmark

**17:30 – 17:35**  
*Shaping of lipid membranes in a microfluidic diffusion chamber*  
Mojca Mally, Saša Vrhovec, Bojan Božič, Saša Svetina, *Jure Derganc*  
University of Ljubljana, Slovenia; Jožef Stefan Institute, Slovenia

**17:35 – 17:40**  
*The development of easy-to-make continuous flow micro-reactors for biological and chemical purposes*  
*Domenico Andrea Cristaldi,* Pablo García-Manrique, Eugen Stulz, Xunli Zhang  
University of Southampton, United Kingdom; University of Oviedo, Spain

**17:40 – 17:45**  
*Multivalency effects on the immobilization of sucrose phosphorylase in flow microchannels for the development of a high-performance biocatalytic microreactor*  
*Donya Valikhani,* Juan M. Bolivar, Martin Pfeiffer, Bernd Nidetzky  
Graz University of Technology, Austria

**17:45 – 17:50**  
*Experimental and theoretical evaluation of residence time distribution in miniaturized packed bed reactors with Novozym® 435*  
*Filip Strniša,* Marijan Bajić, Peter Panjan, Tomaž Urbič, Polona Žnidaršič Plazl, Adama Marie Sesay, Igor Plazl  
University of Ljubljana, Slovenia; University of Oulu, Finland

**17:50 – 17:55**  
*Biodiesel purification in a microseparator: deep eutectic solvents vs water*  
Anita Šalić, *Ana Jurinjak Tušek,* Bruno Zelić  
University of Zagreb, Croatia

**17:55 – 18:00**  
*Implementation of aqueous micellar two-phase systems within a microfluidic device for protein purification*  
Filipa A. Vicente, *Živa Brečko,* Mojca Seručnik, João A. P. Coutinho, Sónia P. M. Ventura, Polona Žnidaršič Plazl  
Universidade de Aveiro, Portugal; University of Ljubljana, Slovenia

18:00 – 20:00  *Poster session*
Tuesday, 25th April 2017

9:00 – 9:55

**Plenary talk**

_Microfluidic droplets as tools for high-throughput biology: enzyme evolution, recruitment and discovery based on catalytic promiscuity_

*Florian Hollfelder*

University of Cambridge, United Kingdom

Chair

*Takehiko Kitamori*, The University of Tokyo, Japan

**Session**

**ANALYTICAL MICRODEVICES**

Chair

*Torsten Mayr*, Graz University of Technology, Austria

*Gerardo Perozziello*, University of Magna Graecia, Italy

10:00 – 10:30

**Keynote lecture**

_A new platform “immuno-wall device” as a rapid diagnostics tool_

*Manabu Tokeshi*

Hokkaido University, Japan

10:30 – 10:50

_Development of a microfluidic platform mimicking cascading liver metabolic reactions_

*Gulsim Kulsharova*, Peter Panjan, Tiina Tolonen, Adama M. Sesay, Frank Baganz, Nicolas Szita

University College London, United Kingdom; University of Oulu, Finland

10:50 – 11:20

_Coffee break_

11:20 – 11:40

_Real-time determination of oxygen concentration and pH in droplet microfluidic culturing systems using optical sensor nanoparticles_

*Shiwen Sun*, Michal Horka, Miguel Tovar, Lisa Mahler, Artur Ruszczak, Josef Ehgartner, Martin Roth, Piotr Garstecki, Torsten Mayr

Graz University of Technology, Austria; Polish Academy of Sciences, Poland; Leibniz Institute for Natural Product Research and Infection Biology – Hans Knöll Institute, Germany

11:40 – 12:00

_Multifunctional membranes based on co-electrospinning: new material for the development of microbioreactors and biosensors_

*Teresa Ramon-Marquez*, Antonio L. Medina-Castillo, Alberto Fernandez-Gutierrez, Jorge F. Fernandez-Sanchez

University of Granada, Spain; NanoMyP®, Spain

12:00 – 12:20

_Integrated biosensors as tools for online microbioreactor analytics_

*Peter Panjan*, Polona Žnidaršič Plazl, Jorge Fernandez-Sanchez, Vesa Virtanen, Adama Marie Sesay

University of Oulu, Finland; University of Ljubljana, Slovenia; University of Granada, Spain

12:20 – 12:40

_Sensor integration in microbioreactor systems for high-throughput bioprocesses_

*Ana C. Fernandes*, Daria Semenova, Josef Ehrgartner, Torsten Mayr, Adama M. Sesay, Krist V. Gernaey, Ulrich Krühne

Technical University of Denmark, Denmark; Graz University of Technology, Austria; University of Oulu, Finland

12:40 – 13:00

_Miniaturized high throughput ecotoxicity test for microorganisms growth_

*Cindy Hany*, Flavie Sarrazin, Philippe Marchal, Jacques-Aurélien Sergent

Laboratoire du Futur, Solvay-CNRS, France; Solvay Toxicological and Environmental Risk Assessment, Belgium
13:00 – 14:00  Lunch

14:00 – 15:00  COST Action “Systems Biocatalysis” meeting

14:00 – 15:30  Poster session

15:30 – 19:30  Excursion

20:00  Gala dinner

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**Wednesday, 26th April 2017**

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| 9:00 – 9:55   | **Plenary talk**  
|               | Slug-flow microfluidic bioreactors for production of special chemicals  
|               | Michal Přibyl  
|               | University of Chemistry and Technology, Prague, Czech Republic  
|               | Chair  
|               | Volker Hessel, Eindhoven University of Technology, The Netherlands  |

**Session**  
**BIOPROCESS INTENSIFICATION AND INTEGRATION**

**Chair**  
Goran N. Jovanović, Oregon State University, USA  
Igor Plazl, University of Ljubljana, Slovenia

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| 10:00 – 10:30 | **Keynote lecture**  
|               | Manufacturing development strategies for bio-lamina-plate technology and other process intensification technologies  
|               | Brian K. Paul, Kijoon Lee, Matthew Coblyn and Goran Jovanovic  
|               | Oregon State University, USA |

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| 10:30 – 10:50 | Sustainability of process options for enzymatic packed bed flow reactors at relevant scale and future role of ‘spacians’  
|               | Volker Hessel, Smitha Sundaram, Sandra Budžaki, Goran Miljić, Marina Tišma  
|               | Eindhoven University of Technology, The Netherlands; Josip Juraj Strossmayer University of Osijek, Croatia  |

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| 11:20 – 11:40 | Continuous lipase B-catalysed isoamyl acetate synthesis in a two-liquid phase system using Corning® AFR™: optimization and scale-up  
|               | Daniela Lavric, Uroš Novak, Polona Žnidaršič Plazl  
|               | Corning S.A.S, France; University of Ljubljana, Slovenia |

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| 11:40 – 12:00 | Development of a microbioreactor system for biopharmaceutical applications and analysis of scale down effects  
|               | Lasse Frey, Detlev Rasch, Susanna Lladó Maldonado, Sven Meinen, Andreas Dietzel, Rainer Krull  
|               | Technical University of Braunschweig, Germany |

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| 12:00 – 12:20 | Mechanistic models in the development of microfluidic screening technologies  
|               | Daria Semenova, Ana C. Fernandes, Barbara Vadot, Juan M. Bolivar, Torsten Mayr, Ulrich Krühne, Alexandr Zubov, Krist V. Gernaey  
|               | Technical University of Denmark, Denmark; INP - Ecole Nationale des Ingénieurs en Arts Chimiques et Technologiques, France; Graz University of Technology, Austria |
12:20 – 12:40  Multiphase separation in microscale-based systems using capillary pressure gradients  
Goran Jovanovic, Matthew Coblyn, Conor Zoebelein, Mark Dolan  
Oregon State University, USA

12:40 – 13:00  Study on aqueous/organic two-phase flow in nanochannel for femto-liter solvent extraction  
Yutaka Kazoe, Hiroki Sano, Takuya Ugajin, Kazuma Mawatari, Takehiko Kitamori  
The University of Tokyo, Japan

13:00 – 13:15  Closing ceremony