

RECOMBINANT PROTEIN PRODUCTION

17-19 October 2023 Girona, Spain



The 11th Conference on Recombinant Protein Production – RPP11 was held in Girona, Spain on 17-19 October 2023. The event, organized by the Microbial Biotechnology Division of the European Federation of Biotechnology, was attended by 180 scientists from industry and academia.

The topics covered included:

- Host physiology under recombinant protein production conditions
- Cell engineering for recombinant protein production
- RPP and the SDGs
- RPP4.0.

The event included also a special pre-conference session co-organised by Greener RPP, SECRETERS, and BioProEng.

The next edition of the Conference on Recombinant Protein Production will be held in 2025.

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RPP11 RECOMBINANT PROTEIN PRODUCTION

17-19 October 2023 Girona, Spain



Organised by

efb | Microbial
Biotechnology

Scientific Programme

Tuesday, 17 October 2023

9:00

Registration opens

Special pre-conference session (Greener RPP, SECRETERS, BioProEng) - open to all RPP11 participants

Sala de graus

- 10:30 -10:40 Welcome address and introduction of the Greener RPP, SECRETERS and BioProEng PhD programs
- 10:40 – 10:55 Unfolded protein response biosensors for recombinant protein expression
Helena Godon, acib, Austria
- 10:55 – 11:10 Impact of oxygen availability on organelle-specific redox potentials and stress in recombinant protein producing *Pichia pastoris*
Aliki Kostopoulou, Austrian Center of Industrial Biotechnology (ACIB), Austria
- 11:10 – 11:25 CASPON technology – a platform process for non-platform proteins using *Escherichia coli*
Christoph Köppl, ACIB GmbH, Austria
- 11:25 – 11:40 Extracellular recombinant peptide production in *Escherichia coli*
Martin Gibisch, University of Natural Resources and Life Sciences, Vienna, Austria
- 11:40 – 11:55 Comprehensive absolute protein quantification as a key factor to optimize recombinant protein production in bacteria
Francesca Grilli, University of Greifswald, Germany
- 11:55 – 12:10 Expression of fully human monoclonal antibodies against *Staphylococcus aureus*
Aishi Shreya Satapathy, University Medical Center Groningen, the Netherlands

12:30 – 14:00

Lunch buffet

Welcome and opening session

Aula magna

- 14:00 – 14:15 Organiser's opening and welcome address
Pau Ferrer, Universitat Autònoma de Barcelona, Spain
Jan Maarten van Dijk, University of Groningen, the Netherlands
- 14:15 – 14:55 *Opening keynote lecture:*
Building and SCRaMbLeing synthetic yeast genome
Patrick Cai, University of Manchester, United Kingdom

Session 1: Host physiology under recombinant protein production conditions

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Chair: **Brigitte Gasser**

- 15:00 – 15:30 Systems and synthetic biology allow for tuning of secretory pathways of mammalian cells for improved protein yield and quality
Johan Rockberg, Royal Institute of Technology, Sweden
- 15:30 – 15:50 Behind productive phenotypes: the energy story of Chinese hamster ovary cells
Jerneja Stor, Austrian Centre of Industrial Biotechnology (ACIB), Austria

Tuesday, 17 October 2023

- 15:50 – 16:10 Uncovering near-zero growth associated long non-coding RNAs in *Komagatella phaffii*
Benjamin Coltman, IMMB BOKU, Vienna, Austria
- 16:10 – 16:30 Scalable microbioreactor system enabling efficient *Pichia pastoris* clone screening for production of biopharmaceuticals
Eva Maria Akke Palmqvist, Sanofi-Aventis Deutschland GmbH, Germany
- 16:30 – 17:00 *Coffee break*
- 17:00 – 17:20 Chromatin-modifying complex SWI/SNF is involved in the regulation of methanol utilization (MUT) pathway genes in *Komagataella phaffii*
Kirill Smirnov, Graz University of Technology, Austria
- 17:20 – 17:40 MicroNAP-web: a novel framework to characterize genomic and transcriptomic changes in engineered microbial strains based on next generation sequencing data
Veronika Schusterbauer, bisy GmbH, Austria
- 17:40 – 18:00 Improving industrial protein secretion in *Bacillus subtilis* using RNA-seq and Ribo-seq
Biwen Wang, University of Amsterdam, the Netherlands
- 18:00 - 18:20 Exploring the physiology of genome-engineered 'mini*Bacillus*' strains
Jan Maarten Van Dijk, University Medical Center Groningen, the Netherlands
- 18:30 – 22:00 Poster setup, exhibition, and welcome buffet

Wednesday, 18 October 2023

Session 2: Cell engineering for recombinant protein production

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Chair: **Ulrike Mäder**

- 9:00 -9:30 Plant cell culture-based production of recombinant proteins
Anneli Ritala, VTT Technical Research Centre of Finland Ltd, Finland
- 9:30 – 9:50 Production of crystal-stored proteins using *Bacillus thuringiensis* molecular tools
Michel Gohar, INRAe MICALIS, France
- 9:50 – 10:10 How to make antibodies and other disulfide-bonded proteins in midi*Bacillus*
Tobias Schilling, University Medical Center Groningen, the Netherlands
- 10:10 – 10:30 Going beyond the limit: impact of increasing global translation activity on the productivity of recombinant secreted proteins in *Pichia pastoris*
Jennifer Staudacher, Austrian Centre for industrial biotechnology, Austria
- 10:30 – 11:00 *Coffee break*
- 11:00 – 11:30 Engineering innovative microbial expression strains to produce next-generation biologics
Markus Mund, Sanofi, Germany
- 11:30 – 11:50 Synthetic protein secretion pathways to deliver recombinant therapeutical proteins
Urartu Seker, Bilkent University, Turkey
- 11:50 – 12:30 Round Table
The future of Recombinant Protein Production: questions today for tomorrow's needs
- 12:30 – 13:30 *Lunch*
- 13:00 – 15:00 Poster session (odd numbers)
- 13:45 – 14:45 Microbial Biotechnology Division Board meeting

Wednesday, 18 October 2023

Session 2: Cell engineering for recombinant protein production

Aula magna

Chair: Karin Koch

- 15:00 – 15:20 Identification, characterization and development of novel CRISPR-nucleases for cell engineering
Klaus Liebeton, BRAIN Biotech AG, Germany
- 15:20 – 15:40 Antibiotic-free protein production in *E. coli* using Pop-Out-Plasmid technology
Arvi Joers, Gearbox Biosciences, Estonia
- 15:40 – 16:00 Fast-track from gene to protein in *Pichia pastoris*
Florian Weiss, Graz University of Technology, Austria
- 16:00 – 16:20 EcCustom: an *E. coli* customization platform for improving recombinant protein production yields in a target dependent manner
Alexandros Karyolaimos, Stockholm University, Sweden
- 16:20 – 16:50 *Coffee break*
- 16:50 – 17:10 Development of a series of *Escherichia coli* strains for high-level recombinant membrane protein production
Eleni Vasilopoulou, BSRC Alexander Fleming, Greece
- 17:10 – 17:30 High yield ligation of up to four protein domains using orthogonal inteins with non-native splice junctions
Alejandro Romero-Casañas, Universitat de Girona, Spain
- 17:30 – 17:50 Successful production of vaccine candidate molecules including SARS-Cov-2 antigens in the filamentous fungus *Thermothelomyces heterothallica* C1
Ulrike Abendroth, VTT Technical Research Centre of Finland Ltd., Finland
- 17:50 – 18:10 Biomanufacturing: high throughput microfermentation, how can it help you!
Sebastian Blum, Beckman Coulter, Germany

Thursday, 19 October 2023

Session 3: RPP and the SDGs

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Chairs: Diethard Mattanovich and Paola Branduardi

- 9:00 - 9:30 BIMERVAX® COVID-19 vaccine – a recombinant protein-based vaccine platform to fight against pandemics
Antonio Barreiro, HIPRA, Spain
- 9:30 – 9:50 New platforms for the fast production of charged vault-like nanoparticles based on eukaryotic and prokaryotic systems
Roger Fernandez Palomeras, Institut de Biotecnologia i Biomedicina / Universitat Autònoma de Barcelona, Spain
- 9:50 – 10:10 Rational design of recombinant antimicrobial proteins based on Host Defense Peptides active against bacterial and viral pathogens
Elena Garcia-Fruitós, IRTA, Spain
- 10:10 – 10:30 CPI Biologics: an accelerator for innovative microbial processes
Gabriela Henriques, CPI (Centre for Process Innovation UK), United Kingdom
- 10:30 – 11:00 *Coffee break*

Thursday, 19 October 2023

- 11:00 – 11:30 From methanol to protein – yeast platforms for sustainable food production
Matthias Windhagauer, FermX, Austria
- 11:30 – 11:50 Engineering *E. coli* for microbial casein production
Anna Maria Erian, Fermify, Austria
- 11:50 – 12:30 *Keynote lecture*
Rationally designing efficient enzymes: towards the development of computational protocols for enzyme design
Sílvia Osuna, Universitat de Girona, Spain
- 12:30 – 13:30 *Lunch*
- 13:00 – 15:00 Poster session (even numbers)

Session 4: RPP4.0

Aula magna

Chair: **Joachim Klein**

- 15:00 – 15:30 Models and data as drivers for Industry 4.0 implementation in biomanufacturing
Krist V. Gernaey, Technical University of Denmark, Denmark
- 15:30 – 15:50 Towards a fully automated model based characterization for production strain selection and bioprocess development
Peter Neubauer, TU Berlin, Germany
- 15:50 – 16:10 mbDOE optimization of fed-batch processes for PET degrading enzymes in *E. coli*
Lisa Fohler, University of Natural Resources and Life Sciences, Austria
- 16:10 – 16:40 *Coffee break*
- 16:40 – 17:00 Econti - accelerated, low ecological footprint, manufacturing platform for continuous production of biotechnological products
Natalia Danielewicz, enGenes Biotech, Austria
- 17:00 – 17:20 Methanol-free protein production processes with *Pichia pastoris* for achieving high productivity
Aid Atlić, VALIDOGEN GmbH, Austria
- 17:20 – 17:50 Recombinant protein production: implementing industry 4.0 tools for optimal monitoring and control of microbial growth parameters
Juan Moreno-Cid, Bionet, Spain

Closing session

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- 17:50 – 18:00 Organisers' closing and concluding remarks
Pau Ferrer, Universitat Autònoma de Barcelona, Spain
Jan Maarten van Dijk, University of Groningen, the Netherlands
- 19:00 *Bus to the restaurant and reception*
- 20:00 *Conference dinner*