Program

Biochemical and Molecular Engineering XX

The Next Generation of Biochemical Engineering: From Nanoscale to Industrial Scale

July 16 - 20, 2017

The Duke Marriott Newport Beach
Newport Beach, CA, USA

Conference Co-Chairs

Wilfred Chen
University of Delaware, USA

Nicole Borth
Universität für Bodenkultur, Vienna, Austria

Stefanos Grammatikos
UCB Pharma, Belgium

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Engineering Conferences International (ECI) is a not-for-profit global engineering conferences program, originally established in 1962, that provides opportunities for the exploration of problems and issues of concern to engineers and scientists from many disciplines.

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Previous conferences in this series:

Biochemical Engineering
August 20-25, 1978
New England College, Henniker, New Hampshire
Conference Chairs:
W. R. Vieth, Rutgers University
A. Constantinides, Rutgers University

Biochemical Engineering II
July 13-18, 1980
New England College, Henniker, New Hampshire
Conference Chair:
A. Constantinides, Rutgers University

Biochemical Engineering III
Sept. 19-24, 1982
Santa Barbara, California
Conference Chair:
K. Venkatsubramanian, H.J. Heinz Co. and Rutgers University

Biochemical Engineering IV
Sept. 30 - Oct. 5,1984
Galway, Ireland
Conference Chairs:
H. Lim , Purdue University
Patrick Fottrell, University of Galway

Biochemical Engineering V
July 27-Aug 1,1986
New England College, Henniker, New Hampshire
Conference Chair:
W.A. Weigand, Illinois Institute Of Technology

Biochemical Engineering VI
October 2-7,1989
Santa Barbara, California
Conference Chair:
Walter E. Goldstein, ESCA Genetic Corp.

Biochemical Engineering VII
March 3-8, 1991
Santa Barbara, California
Conference Chairs:
H. Pedersen, Rutgers University
D. DiBiasio, Worcester Polytechnic

Biochemical Engineering VIII
July 11-16, 1993
Princeton, New Jersey
Conference Chairs:
Subhash Karkare, Amgen
Robert M. Kelly, North Carolina State University

Previous conferences in this series:

Biochemical Engineering IX
May 21-26,1995
Davos, Switzerland
Conference Chairs:
J. Bailey, ETH
D. Zabriskie, SmithKline Beecham

Biochemical Engineering X
May 18-23,1997
Kananaskis, Alberta, Canada
Conference Chairs:
W-S. Hu, University of Minnesota
J. Swartz, Genentech

Biochemical Engineering XI
July 25-30,1999
Salt Lake City, Utah
Conference Chairs:
George Georgiou, University of Texas
Steven Lee, Merck & Co., Inc.

Biochemical Engineering XII
June 10-15, 2001
Rohnert Park, California
Conference Chairs:
Doug Clark, University of California-Berkeley
Jay Keasling, University of California-Berkeley
David Robinson, Merck

Biochemical Engineering XIII
July 19-23, 2003
Boulder, Colorado
Conference Chairs:
Eleftherios Terry Papoutsakis, Northwestern University
Dr Weichang Zhou, Protein Design Labs

Biochemical Engineering XIV
July 10-14, 2005
Harrison Hot Springs, B.C., Canada
Conference Chairs:
William Bentley, University of Maryland
Hendrik J. Meerman, Genencor International, Inc.
Mike Betenbaugh, Johns Hopkins University
Vijay Yabannavar, Chiron

Biochemical Engineering XV
July 15-19, 2007
Quebec City, Quebec, Canada
Conference Chairs:
M. Betenbaugh, Johns Hopkins University
V. Yabannavar, Trubion Pharmaceuticals
A. Robinson, University of Delaware
E. Schaefer, BMS

Previous conferences in this series:

Biochemical Engineering XVI
July 5-9, 2009
Burlington, Vermont, USA
Conference Chairs:
A. Robinson, University of Delaware
E. Schaefer, BMS

Biochemical Engineering XVII
June 26-30, 2011
Seattle, Washington, USA
Conference Chairs:
F. Baneyz, University of Washington
C. Maranas, Penn State University
B. Junker, Merck Research

Biochemical Engineering XVIII
June 16-20, 2013
Beijing, China
Conference Chairs:
David Robinson, Merck
Tianwei Tan, Beijing University of Chemical Technology
Huimin Zhao, University of Illinois at Urbana-Champaign

Biochemical Engineering XIX
July 12-16, 2015
Puerto Vallarta, Mexico
Conference Chairs:
Theresa Good, National Science Foundation
Gargi Seth, Intas Pharmaceuticals Ltd.

JAY KEASLING TO RECEIVE THE AMGEN BIOCHEMICAL AND MOLECULAR ENGINEERING AWARD

The Amgen Award (supported by Amgen, Inc., Thousand Oaks, CA, a leading biotechnology company with pioneering human therapeutic products) is given in memory of **James E. Bailey** to recognize research excellence and leadership in ***Biochemical and Molecular Engineering***. An award of $5000 cash and a commemorative plaque from Amgen will be presented at the ECI Conference on Biochemical and Molecular Engineering in Newport Beach, California.

The 2017 awardee is **Jay Keasling**.

Jay Keasling is the Hubbard Howe Jr. Distinguished Professor of Biochemical Engineering at the University of California, Berkeley, in the Departments of Bioengineering and Chemical and Biomolecular Engineering, a senior faculty scientist and Associate Laboratory Director for Biosciences at Lawrence Berkeley National Laboratory, and Chief Executive Officer of the Joint BioEnergy Institute (JBEI).

Dr. Keasling's research focuses on the metabolic engineering of microorganisms for degradation of environmental contaminants or for environmentally friendly synthesis of drugs, chemicals, and fuels. Keasling received a B.S. in Chemistry and Biology from the University of Nebraska and M.S. and Ph.D. in Chemical Engineering from the University of Michigan, and did post-doctoral research in biochemistry at Stanford University.

He is a member of the National Academy of Engineering and the National Academy of Inventors. Keasling has won numerous awards, including:

- the 2015 *Eric and Sheila Samson Prime Minister's Prize in Innovation in Alternative Fuels for Transportation*;
- the *Innovator Award – Biosciences* from the Economist Magazine in 2014;
- the *Eni Renewable Energy Prize* from Eni S.p.A. in 2014;

- the *George Washington Carver Award for Innovation in Industrial Biotechnology* from the Biotechnology Industry Organization in 2013;
- the *Promega Biotechnology Research Award* from the American Society for Microbiology in 2013;
- the *Heinz Award for Technology, the Economy and Employment* from the Heinz Family Foundation in 2012;
- *International Metabolic Engineering Award* from the Metabolic Engineering Society in 2012;
- *Presidential Green Chemistry Challenge Award* from the United States Environmental Protection Agency in 2010;
- the Inaugural *Biotech Humanitarian Award* from the Biotechnology Industry Organization (BIO) in 2009;
- *Scientist of the Year* from Discover Magazine in 2006; and
- the *Technology Pioneer Award* from the World Economic Forum in 2005.

Keasling is the founder of Amyris, LS9, Lygos, Constructive Biology, and Demetrix.

2017 Biochemical Engineering Journal Young Investigator Award Winner:

Radhakrishnan Mahadevan

Launched in 2009, this now annual award recognizes outstanding excellence in research and practice contributed to the field of biochemical engineering by a young community member. The award winner receives a cash prize of US $2,500 and presents a Keynote Lecture at the Biochemical and Molecular Engineering conference (odd years) or the European Symposium on Biochemical Engineering Sciences (even years).

Radhakrishnan Mahadevan is a Professor in the Department of Chemical Engineering and Applied Chemistry and the Institute of Biomaterials and Biomedical Engineering at the University of Toronto.

He obtained his B.Tech from the Indian Institute of Technology, Madras, in Chemical Engineering in 1997, and then obtained his PhD. Degree from the University of Delaware in Chemical Engineering in 2002. He was a research scientist at Genomatica Inc., San Diego from 2002-2006 and has also held appointments as a visiting scholar and a guest lecturer at the Department of Bioengineering at the University of California, San Diego, and in the Department of Microbiology, University of Massachusetts, Amherst.

His research interests are in the area of modeling, analysis and optimization of metabolism for applications in bioremediations, biochemicals production and medicine.

He has received the *David W. Smith Jr. Best Paper Award* in 2006, the *Jay Bailey Young Investigator Award in Metabolic Engineering* in 2010, the *Society of Industrial Microbiology and Biotechnology's Young Investigator Award* in 2012, the *University of Toronto FASE Research Leaders Award* in 2013, the *Alexander von Humboldt Fellowship* in 2014, and the *Syncrude Innovation Award* in 2014.

His award lecture, scheduled for July 18, 2017 at 11:00 am, is entitled **Design principles for control of metabolism: Role of enzymatic regulation, redundancy and orthogonality**.

Conference Sponsors

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Visit Newport Beach

Notes and room locations

- *Technical sessions will be in the Bay Laurel Central and South rooms.*
- *Poster Sessions will be in the Sequoia Ballroom and Bay Laurel North rooms.*
- *Workshop locations are listed in the program.*
- *Breakfasts and lunches will be in the Bamboo Garden.*
- *Dinner on Sunday will be in the Bamboo Garden.*
- *Dinners on Monday and Wednesday will be in the Orchid Terrace.*
- *The ECI office will be in the Catalina Boardroom.*
- *Audiotaping, videotaping and photography of presentations are prohibited.*
- *Speakers – Please have your presentation loaded onto the conference computer prior to the session start (preferably the day before).*
- *Speakers – Please leave at least 3-5 minutes for questions and discussion.*
- *Please do not smoke at any conference functions.*
- *Turn your mobile telephones to vibrate or off during technical sessions.*
- *Please write your name on your program so that it can be returned to you if lost or misplaced.*
- *After the conference, ECI will send an updated participant list to all participants. Please check your listing now and if it needs updating, you may correct it at any time by logging into your ECI account.*

Sunday, July 16, 2017

13:00 – 15:30 **Conference check-in** (Bay Laurel Foyer)

15:30 – 15:50 **Welcome from Conference Chairs and ECI Liaison**
Wilfred Chen, University of Delaware, USA
Nicole Borth, Universität für Bodenkultur, Vienna, Austria
Stefanos Grammatikos, UCB Pharma, Belgium
Beth Junker, ECI Conferences Committee Liaison

15:50 – 19:00 **Protein Design, Expression, Processing and Formulation**
Session Chairs: **Anne Robinson**, Tulane University, USA
Chris Oostenbrink, University of Natural Resources and Life Sciences, Vienna, Austria
William Bentley, University of Maryland, USA

15:50 – 15:55 Introduction

15:55 – 16:25 **Engineered ligand and receptor based fusion proteins as next generation cancer therapeutics (Invited)**
Jennifer Cochran, Stanford University, USA

16:25 – 16:45 **Nature inspired antibody design and optimization**
Peter Tessier, Rensselaer Polytechnic Institute, USA

16:45 – 17:05 **Application of phage display and plasmid display to broaden the specificity of human Fbs1 for capture of N-glycosylated peptides**
James C Samuelson, New England Biolabs, USA

17:05 – 17:15 **Computational redesign of acyl-ACP thioesterase with improved selectivity towards medium chain fatty acids at high production levels**
Costas Maranas, The Pennsylvania State University, USA

17:15 – 17:45 **Coffee break**

17:45 – 18:05 **Computational prediction of expression and solubility of recombinant biopharmaceuticals**
Alan Dickson, University of Manchester, United Kingdom

18:05 – 18:20 **Engineering high titer heterologous protein secretion in bacteria**
Danielle Tullman-Ercek, Northwestern University, USA

18:20 – 18:35 **Intended insoluble expression of recombinant protein with a pull-down tag in E. coli for simplifying product purification and increasing yield**
Daniel Hoffmann, University of Applied Sciences Mittelhessen, Germany

18:35 – 19:00 **Establishing cell-free synthetic biology for the production of therapeutic glycoproteins and chemicals**
Mike Jewett, Northwestern University, USA

19:00 – 20:00 **Keynote Presentation**
DNA damage, neurodegeneration and mitochondrial dysfunction
Vilhelm A. Bohr, National Institutes of Health (NIH), USA

20:00 – 21:30 **Dinner**

Monday, July 17, 2017

06:00 – 08:00	**Breakfast**
08:00 – 10:05	**Vaccine Design: From Prevention to Therapeutic Approaches** Session Chairs: **Paula Alves**, IBET & ITQB NOVA, Portugal **Ravi Kane**, Georgia Institute of Technology, USA
08:00 – 08:05	Introduction
08:05 – 08:45	**Respiratory Syncytial Virus** (**RSV)-Vaccines: Engineering immunogenicity (Invited)** Marty Moore, Emory University, USA
08:45 – 09:05	**Bioprocess engineering of insect cells for accelerating vaccines development** Paula Alves, iBET & ITQB-NOVA, Portugal
09:05 – 09:25	**AAV gene therapy for alcoholism: Inhibition of mitochondrial aldehyde dehydrogenase enzyme expression in hepatoma cells** Anamaria Sanchez, University of Chile, Chile
09:25 – 09:45	**Novel approaches to prevent and treat pertussis** Jennifer Maynard, University of Texas at Austin, USA
09:45 – 09:50	**Engineering the adenylate cyclase toxin for use as a Bordetella pertussis vaccine antigen (Poster Spotlights: 5 minutes – 3 slides no questions)** Andrea M. DiVenere, University of Texas at Austin, USA
09:50 – 09:55	**Toward the identification of cellular mechanisms behind the lethal phenotypes in malaria parasites blood stages with PlasmoGEM and metabolic modeling (Poster Spotlights: 5 minutes – 3 slides no questions)** Anush Chiappino-Pepe, Swiss Federal Institute of Technology (EPFL), Switzerland
09:55 – 10:00	**Next generation antibody and TCR therapeutics for infectious disease (Poster Spotlights: 5 minutes – 3 slides no questions)** Ellen K. Wagner, The University of Texas at Austin, USA
10:00 – 10:05	**Overcoming challenges in the production of Hepatitis C virus like particles (Poster Spotlights: 5 minutes – 3 slides no questions)** Manuel Carrondo, IBET & ITQB NOVA, Portugal
10:05 – 10:35	**Coffee break**
10:35 – 12:55	**Visions for Biochemical and Molecular Engineering** Session Chairs: **George Georgiou**, University of Texas, USA **E. Terry Papoutsakis**, University of Delaware, USA
10:35 – 10:40	Introduction
10:40 – 11:15	**From physics to synthetic biology & entrepreneurship** Noah Helman, Industrial Microbes, Emeryville, USA
11:15 – 11:40	**Viral vectorology for gene therapy** Paula Alves, IBET & ITQB NOVA, Portugal

Monday, July 17, 2017 (continued)

11:40 – 12:05	**Opportunities and challenges in therapeutics discovery and development** George Georgiou, University of Texas, USA
12:05 – 12:30	**Opportunities for collective advancement in the biopharmaceutical manufacturing community** Kelvin H Lee, University of Delaware, USA
12:30 – 12:55	**The European biochemical engineer: Extinct? Endangered? Mutated?** Stefanos Grammatikos, UCB Pharma, Belgium
12:55 – 14:00	**Lunch**
14:00 – 16:55	**Advances in Bioprocessing** *Sponsored by UCB Pharma S.A.* Session Chairs: **Thomas Ryll**, Immunogen, USA **Martin Gawlitzek**, Genentech, Inc., USA
14:00 – 14:05	Introduction
14:05 – 14:35	**Exosome-based Biotherapeutics: Opportunities, development and path to commercialization (Invited)** Konstantin Konstantinov, Codiak BioSciences, USA
14:35 – 14:55	**A continuous loop of bioreactors to provide for life support in space** Francesc Godia, Universitat Autonoma de Barcelona, Spain
14:55 – 15:15	**Acoustic cell concentration, washing & perfusion for cellular therapy manufacturing** James Piret, University of British Columbia, Canada
15:15 – 15:35	**A disruptive alternative to semi-continuous multi-column chromatography processes** Michael Rose, UCB, United Kingdom
15:35 – 16:05	**Coffee break**
16:05 – 16:25	**Sensitive cells: Enabling tools for static and dynamic control of microbial pathways** Mattheos Koffas, Rensselaer Polytechnic Institute, USA
16:25 – 16:45	**Advancing downstream purification of cell and gene therapy medicinal products** Manuel Carrondo, iBET, Portugal
16:45 – 16:50	**Glucocorticoids modulate CHO cell glycosylation in chemically-defined media (Poster Spotlights: 5 minutes – 3 slides no questions)** Brian Kwan, Merck & Co., Inc., USA
16:50 – 16:55	**Process intensification for production of a peste des petites ruminants virus (PPRV) vaccine (Poster Spotlights: 5 minutes – 3 slides no questions)** Paula Alves, IBET & ITQB NOVA, Portugal

Monday, July 17, 2017 (continued)

17:00 – 19:10	**Genome Engineering** Session Chairs: **Mike Betenbaugh**, Johns Hopkins University, USA **Sang Yup Lee**, KAIST, Korea
17:00 – 17:05	Introduction
17:05 – 17:35	**Development of CRISPR-derived technologies for genome regulation and applications** Stanley Qi, Stanford University, USA
17:35 – 18:00	**Rational sRNA design for strain engineering** Lydia Contreras, University of Texas-Austin, USA
18:00 – 18:25	**Elimination of the "essential" Warburg effect in mammalian cells through a multiplex genome engineering strategy** Nathan Lewis, University of California, San Diego, USA
18:25 – 18:30	**Host cell protein control via CHO genome engineering (Poster Spotlights: 5 minutes – 3 slides no questions)** Jong Youn Baik, University of Delaware, USA
18:30 – 18:35	**Generation of a Chinese Hamster Ovary cell genome-wide deletion library (Poster Spotlights: 5 minutes – 3 slides no questions)** Valerie Schmieder, Austrian Center of Industrial Biotechnology, Austria
18:35 – 18:40	**WITHDRAWN**
18:45 – 19:10	**Genome engineering technologies for programming and recoding organisms (Invited)** Farren Isaacs, Yale University, USA
19:15 – 20:30	**Dinner**
20:30 – 22:30	**Poster Session 1** Session Chairs: **Astrid Duerauer,** Universität für Bodenkultur, Vienna, Austria **Xiaoxia "Nina" Lin**, University of Michigan, USA **Javier Femenia,** Biomarin Pharmaceutical, USA

Tuesday, July 18, 2017

06:00 – 08:00	**Breakfast**
08:00 – 10:35	**Challenges of Miniaturization and Automation in Bioprocess Development**\ Session Chairs: **Alan Dickson**, University of Manchester, UK **Laetitia Malphettes**, UCB Pharma, Belgium
08:00 – 08:05	Introduction
08:05 – 08:35	**From concept to implementation: How automation enables efficiency gains in cell culture process development (Invited)** Sven Markert, Roche Diagnostics GmbH, Germany
08:35 – 08:55	**Alternative strategy enables automation of up- and downstream processes for recombinant production of an antimicrobial peptide in E. coli** Mathias Joachim, University of Applied Sciences Mittelhessen, Germany
08:55 – 09:15	**High-throughput and miniaturized resin reuse studies** Razwan Hanif, UCB, United Kingdom
09:15 – 09:35	**High throughput upstream ranging study using AMBR® 250 mini bioreactors with DOE and multivariate data analysis (MVDA)** Balrina Gupta, Merck & Co., USA
09:35 – 09:50	**Facing the challenges – A miniaturized platform for integrated process development of products from microbial hosts** Astrid Dürauer, University of Natural Resources and Life Sciences Vienna, Austria
09:50 – 10:05	**Use of AMBR250 as a small scale model for manufacturing-scale single-use bioreactors** Diana Ritz, GlaxoSmithKline, USA
10:05 – 10:20	**Managing transfer and scale-up of a process with atypical impact of dissolved oxygen concentration on productivity and product quality** Gayle E. Derfus, Gilead Sciences, USA
10:20 – 10:35	**An ultra-scale-down method to predict diafiltration performance during formulation of concentrated mAb solutions** Lara Fernandez-Cerezo, University College London, United Kingdom
10:35 – 11:05	**Coffee break**
11:05 – 12:05	**The Biochemical Engineering Journal Young Investigator Award & Lecture** **Award Presentation –** Wilfred Chen, University of Delaware **Award Lecture** **Design principles for control of metabolism: Role of enzymatic regulation, redundancy and orthogonality** Krishna Mahadevan, University of Toronto, Canada
12:05 – 15:00	**Lunch** and **Poster Session 2** Session Chairs: **Astrid Duerauer,** Universität für Bodenkultur, Vienna, Austria **Xiaoxia "Nina" Lin**, University of Michigan, USA **Javier Femenia,** Biomarin Pharmaceutical, USA

Tuesday, July 18, 2017 (continued)

15:00 – 17:20	**Synthetic Biology and Network Design** Session Chairs: **Kristala Prather**, Massachusetts Institute of Technology, USA **Matias Zurbriggen**, University of Düsseldorf, Germany
15:00 – 15:05	Introduction
15:05 – 15:35	**Engineering cyanobacteria for use as photosynthetic chemical factories (Invited)** Brian Pfleger, University of Wisconsin-Madison, USA
15:35 – 15:55	**Design of bioswitches for synthetic biology** An-Ping Zeng, Hamburg University of Technology, Germany
15:55 – 16:15	**Synthetic biology platforms for natural product biosynthesis and discovery** James Payne (Christina Smolke Lab), Stanford University, USA
16:15 – 16:35	**Post-translational strategies for enhancing biosynthetic pathway expression and activity** Ian Wheeldon, University of California Riverside, USA
16:35 – 16:55	**Engineering xylose metabolism in Thraustochytrid T18** Alexandra Merkx-Jacques, Mara Renewables Corporation, Canada
16:55 – 17:15	**Filling the knowledge gap in metabolism for analyzing biochemical reactions and designing synthetic pathways** Vassily Hatzimanikatis, Swiss Federal Institute of Technology (EPFL), Switzerland
17:15 – 17:20	**A CRISPR/Cas9 based engineering tool to activate expression of multiple genes individually or in any specific combination (Poster Spotlights: 5 minutes – 3 slides no questions)** Peter Eisenhut, Austrian Centre of Industrial Biotechnology, Austria
17:20	**Free Time and Dinner on your own**

Wednesday, July 19, 2017

06:00 – 08:00	**Breakfast**
08:00 – 10:00	**Bionanotechnology** Session Chairs: **Szu-Wen Wang**, University of California, Irvine, USA **Sierin Lim**, Nanyang Technological University, Singapore
08:00 – 08:05	Introduction
08:05 – 08:45	**Introducing new functions into (and onto) virus-like particles (Invited)** M.G. Finn, Georgia Institute of Technology, USA
08:45 – 09:10	**Human-cell microparticles for cell-therapy and cargo delivery to stem cells** Terry Papoutsakis, University of Delaware, USA
09:10 – 09:35	**Design of nanoscale therapeutics and nanostructured materials** Ravi Kane, Georgia Institute of Technology, USA
09:35 – 10:00	**Supramolecular bioenzyme ensemble: Widening of antioxidant protective potential** Alexander V. Maksimenko, Russian Cardiology Research and Production Complex, Moscow, Russia
10:00 – 10:30	**Coffee break**
10:30 – 10:55	**Electrogenetic actuation of gene expression in bacteria: Towards programmable biological function based on molecular signaling** William Bentley, University of Maryland, USA
10:55 – 11:20	**Protein nanocage: A versatile molecular carrier** Sierin Lim, Nanyang Technological University, Singapore
11:20 – 12:20	**Keynote Presentation** **Engineering human physiology: Discovery and preclinical/clinical development of therapeutic proteins in an academic setting** George Georgiou, University of Texas at Austin, USA
12:30 – 14:00	**Lunch**
14:00 – 16:35	**Biorenewables and Biofuels** Session Chairs: **Ramon Gonzalez**, Rice University, USA **Vassily Hatzimanikatis**, École Polytechnique Fédérale De Lausanne (EPFL), Switzerland
14:00 – 14:05	Introduction
14:05 – 14:35	**Metabolic engineering of yeast for the synthesis of fatty acid and polyketide-based chemicals** Nancy Da Silva, University of California, Irvine, USA
14:35 – 14:55	**Production of biochemicals and biofuels with no CO_2 production and improved product yields** Shawn W. Jones, White Dog Labs, USA

Wednesday, July 19, 2017 (continued)

14:55 – 15:15	**Genes to jeans: A green solution to blue denim** John E. Dueber, University of California, Berkeley, USA
15:15 – 15:35	**Cyclic triterpenoid production with tailored *Saccharomyces cerevisiae*** Birgitta E. Ebert, RWTH Aachen University, Germany
15:35 – 15:55	**Succinic acid production from pulp and paper industry waste - A transcriptomic approach** Chrysanthi Pateraki, Agricultural University of Athens, Greece
15:55 – 16:15	**A synthetic regulon enhances the fitness of yeast on non-native nutrients** Nikhil Nair, Tufts University, USA
16:15 – 16:35	**Rerouting acetyl-CoA and NADPH to improve lipid and oleochemical production in *Yarrowia lipolytica*** Peng Xu, University of Maryland Baltimore County, USA
16:35 – 17:15	**Coffee Break**
17:15 – 18:45	**Parallel Workshops** **Workshop 1 – Integrated Continuous Manufacturing** (Torrey Pine Room) Chairs: Marcella Yu (Boehringer Ingelheim, USA) and Paul Wu (Bayer, USA) **Workshop 2 – Complexities and Challenges of Antibody-Drug Conjugates Development** (Bay Laurel Central Room) Chairs: Robert Herbst and Alex Lazar (Immunogen, USA) **Workshop 3 – Cell Technologies for Cell Therapies** (Bay Laurel South Room) Chairs: Manuel Carrondo (IBET, Portugal) and Jeff Chalmers (Ohio State University)
19:00	**Dinner, Poster Awards (sponsored by ECI and *Biotechnology Journal*) and Amgen Award Lecture** **Amgen Award Presentation –** Nitya Jacob, Amgen **Amgen Award Lecture** **Engineered polyketide synthases: Molecular foundries for commodity chemicals, specialty chemicals, and biofuels** Jay Keasling, Lawrence Berkeley National Laboratory, USA

Thursday, July 20, 2017

06:00 – 07:30 **Breakfast**

07:30 – 09:40 **Practical Applications of Modelling: From Protein Structures to Processes**
Session Chairs: **Nathan E. Lewis**, University of California, San Diego, USA
Elmar Heinzle, Saarland University, Germany

07:30 – 07:35 Introduction

07:35 – 08:05 **ABC for GRASPing enzyme kinetics in metabolic models (Invited)**
Lars Keld Nielsen, Australian Institute for Bioengineering and Nanotechnology (AIBN), The University of Queensland, Australia

08:05 – 08:25 **Predictive macroscopic models of cell growth, metabolism and monoclonal antibody production of fed-batch processes at various scales**
Bassem Ben Yahia, Saarland University and UCB Pharma S.A., Belgium

08:25 – 08:45 **Novel stable isotope methods to identify flux bottlenecks in photosynthetic hosts**
Jamey Young, Vanderbilt University, USA

08:45 – 09:05 **Genome-scale mapping models and algorithms for stationary and instationary MFA-based metabolic flux elucidation**
Saratram Gopalakrishnan, The Pennsylvania State University, USA

09:05 – 09:25 **Automated, simulation-assisted and feedback-guided biomolecular engineering**
Uwe Jandt, Hamburg University of Technology, Germany

09:25 – 09:30 **Risk mitigation and resource savings for biological drug product with computational fluid dynamics simulation (Poster Spotlights: 5 minutes – 3 slides no questions)**
Weixian Shi, Bristol-Myers Squibb, USA

09:30 – 09:35 **WITHDRAWN**

09:35 – 09:40 **Investigating crowded metabolism: A molecular particle approach (Poster Spotlights: 5 minutes – 3 slides no questions)**
Daniel Robert Weilandt, Swiss Federal Institute of Technology (EPFL), Switzerland

09:40 – 10:00 **Coffee Break**

10:00 – 12:00 **Tissue and Stem Cell Engineering**
Sponsored by Biomarin
Session Chairs: **William Miller**, Northwestern University, USA
Lars Keld Nielsen, Australian Institute for Bioengineering and Nanotechnology (AIBN), The University of Queensland, Australia

10:00 – 10:05 Introduction

10:05 – 10:35 **Synthetic pre-metastatic niches for detection and analysis of early metastatic cells (Invited)**
Lonnie D. Shea, University of Michigan, USA

Thursday, July 20, 2017 (continued)

10:35 – 10:55	**The use of intrinsic magnetization to define and separate glioblastoma cancer stem cells** Jeff Chalmers, The Ohio State University, USA
10:55 – 11:00	**Isolation and characterization of cancer stem cells in esophagus squamous cell carcinoma (Poster Spotlights: 5 minutes – 3 slides no questions)** Pei-Jung Lu, National Cheng Kung University, Taiwan
11:00 – 11:20	**Scalable manufacture of pluripotent stem cell derived therapeutics** Nick Timmins, CCRM, Canada
11:20 – 11:40	**The differentiation of pluripotent stem cells to hepatic cells – Parallels between maturation status and metabolic state** Wei-Shou Hu, University of Minnesota, USA
11:40 – 12:00	**Using computational fluid dynamics (CFD) to design and characterize a microfluidic bioreactor for rapid release of culture-derived platelets** William Miller, Northwestern University, USA
12:00 – 12:05	**Wrap-up – Conference Closure**
12:05	**Departure**

Poster Presentations

1. **Process intensification for production of a Peste des Petites Ruminants Virus (PPRV) vaccine**
   Manuel Carrondo, IBET & ITQB NOVA, Portugal

2. **Glucocorticoids modulate CHO cell glycosylation in chemically-defined media**
   Brian Kwan, Merck & Co., Inc., USA

3. **Fractionation of human red blood cells based on intrinsic magnetization**
   Jeff Chalmers, The Ohio State University, USA

4. **Characterization of anaerobic biotransformation of β-hexachlorocyclohexane**
   Mohammad Numan Asad, Helmholtz Institute for Environmental Research, Germany

5. **Nanofiber based lentiviral vector production**
   Jelena Ruscic, University College London, United Kingdom

6. **Periodic counter-current chromatography for continuous purification of monoclonal antibody**
   Ho-Lung Jiang, Academia Sinica, Development Center for Biotechnology, Taiwan

7. **Application of 13C flux analysis to determine impacts of media alterations on industrial CHO cell metabolism**
   Allison G. McAtee Pereira, Vanderbilt University, USA

8. **Utilizing logic-gated DNA strand displacement to induce cancer prodrug activation**
   Rebecca P. Chen, University of Delaware, USA

9. **Interference of steroidogenesis by gold nanorod core/silver shell nanostructures: Implications for reproductive toxicity of silver nanomaterials**
   Xiumei Jiang, Center for Food Safety and Applied Nutrition, US Food and Drug Administration, USA

10. **Biosafey evaluation and anti-oxidative effects of ceria nanoparticles in vitro**
    Hui Zhang, Center for Food Safety and Applied Nutrition, US Food and Drug Administration, USA

11. **PP7 virus-like particle as a functional peptide carrying platform**
    Liangjun Zhao, Georgia Institute of Technology, USA

12. **Engineering of Klebsiella oxytoca capable of simultaneous utilization of multiple sugars for the production of 2, 3- Butanediol**
    Yong Jae Kim, KAIST, South Korea

13. **Complete biosynthesis of adipic acid in Saccharomyces cerevisiae**
    Kaushik Raj Venkatesan, University of Toronto, Canada

14. **Structural and biochemical studies of novel Aldo-keto Reductases (AKRs) for the biocatalytic conversion of 3-hydroxybutanal to 1,3-butanediol**
    Taeho Kim, University of Toronto, Canada

15. **Discovery and evaluation of novel pathways for production of methyl ethyl ketone**
    Milenko Tokic, Swiss Federal Institute of Technology (EPFL), Switzerland

16. **Optimization of the production of methyl ethyl ketone in recombinant Pseudomonas putida using large-scale kinetic models**
Milenko Tokic, Swiss Federal Institute of Technology (EPFL), Switzerland

17. **Toward fully characterized knowledge gaps in metabolic networks: Discovery of missing biochemistry in Escherichia coli**
Anush Chiappino-Pepe, Swiss Federal Institute of Technology (EPFL), Switzerland

18. **Synthetic methylotrophy: Engineering methanol metabolism in a nonnative host**
R. Kyle Bennett, University of Delaware, USA

19. **Sustainable production of industrially relevant biomonomers: A photosynthetic consortia approach**
David N. Carruthers, University of Michigan, USA

20. **The microbial antibodies secretion expression platform with scale down fermentors**
Jen-Wei Chang, Academia Sinica, Development Center for Biotechnology, Taiwan

21. **The simplex algorithm in an automated high-throughput approach for the rapid screening of operating conditions during process understanding and development**
Razwan Hanif, UCB, United Kingdom

22. **Novel clone selection technique reveals heterogeneity among HEK293T cells engineered to produce therapeutic extracellular vesicles**
Jeffrey Chalmers, The Ohio State University, USA

23. **Investigating antibody reduction phenomenon observed in large scale cell culture harvests using a simple scale down model**
Shaunak D. Uplekar, KBI Biopharma, USA

24. **Generation of a Chinese Hamster Ovary cell genome-wide deletion library**
Valerie Schmieder, Austrian Center of Industrial Biotechnology, Austria

25. **Host cell protein control via CHO genome engineering**
Jong Youn Baik, University of Delaware, USA

26. **WITHDRAWN**

27. **Role of CD36 and free fatty acid uptake in epithelial-mesenchymal transition of hepatocellular carcinoma cells**
Christina Chan, Michigan State University, USA

28. **Optimizing a bacterial sRNA scaffold for targeting multiple mRNAs, filtering off-target mRNA interactions, and balancing metabolic pathway flux**
Richard A. Lease, The Ohio State University, USA

29. **Deciphering ambiguous control over fluxes through characterization and reduction of uncertainty**
Ljubisa Miskovic, Swiss Federal Institute of Technology (EPFL), Switzerland

30. **Risk mitigation and resource savings for biological drug product with computational fluid dynamics simulation**
Weixian Shi, Bristol-Myers Squibb, USA

31. **Molecular modeling on HIF2α-ARNT dimer destabilization caused by HIF2α V192D and/or R171A mutations**
Chia-Ning Yang, National University of Kaohsiung, Taiwan

32. **WITHDRAWN**

33. **Generation and analysis of large-scale dynamic nonlinear models of metabolism**
Georgios Fengos, Swiss Federal Institute of Technology (EPFL), Switzerland

34. **Investigating crowded metabolism: A molecular particle approach**
Daniel Robert Weilandt, Swiss Federal Institute of Technology (EPFL), Switzerland

35. **Functional adaptation of mercuric reductases from the deep brine environment of Atlantis II in the Red Sea to high temperature**
Mohamad Maged, American University in Cairo, Egypt

36. **Characterization of a renoprotective AATF peptide in models of diabetic nephropathy**
Qing Guo, University of Oklahoma Health Sciences Center, USA

37. **Antibody engineering on the surface of CHO cells**
Annalee W. Nguyen, The University of Texas at Austin, USA

38. **WITHDRAWN**

39. **Strategies to engineer G protein-coupled receptor ligand binding properties**
Justin I. Yoo, University of California, Santa Barbara, USA

40. **Effects of the A2AR C-terminus on receptor stability**
Kirsten N. Swonger, Tulane University, USA

41. **Intracellular secretion analysis of therapeutic antibodies in engineered high-producible CHO cells**
Kohei Kaneyoshi, Osaka University, Japan

42. **A CRISPR/Cas9 based engineering tool to activate expression of multiple genes individually or in any specific combination**
Peter Eisenhut, Austrian Centre of Industrial Biotechnology, Austria

43. **Engineering the microbiota to treat metabolic disorders**
Nikhil U. Nair, Tufts University, USA

44. **Programmable control of CRISPR-Cas9 systems by engineering sgRNA as toehold-switchable riboregulators**
Ka-Hei Siu, University of Delaware, USA

45. **Exploring chemodiversity in metabolism towards the selective integration of chemistry into biology**
Jasmin Hafner, Swiss Federal Institute of Technology (EPFL), Switzerland

46. **Toward the identification of new cancer therapy targets using metabolic modeling in a human genome scale**
Maria Masid, Swiss Federal Institute of Technology (EPFL), Switzerland

47. **Modeling and analysis of ArsR genetic circuits**
Yves Berset, Swiss Federal Institute of Technology (EPFL), Switzerland

48. **Sort-seq approach to engineering an E. coli formaldehyde-inducible promoter**
Julia Rohlhill, University of Delaware, USA

49. **Functional production of transporters from biomass-degrading anaerobic fungi for metabolic engineering**
Susanna Seppala, University of California, Santa Barbara, USA

50. **Design considerations to ensure accuracy when using the resazurin reduction assay to noninvasively quantify cell expansion within perfused extracellular matrix scaffolds**
William M. Miller, Northwestern University, USA

51. **Isolation and characterization of cancer stem cells in esophagus squamous cell carcinoma**
Pei-Jung Lu, National Cheng Kung University, Taiwan

52. **Engineering T cell receptors for improved therapeutic T regulatory cell (Treg) function**
Elissa K. Leonard, The University of Texas at Austin, USA

53. **Overcoming challenges in the production of Hepatitis C virus like particles**
Manuel Carrondo, IBET & ITQB NOVA, Portugal

54. **Next-generation antibody and TCR therapeutics for infectious disease**
Ellen K. Wagner, The University of Texas at Austin, USA

55. **Toward the identification of cellular mechanisms behind the lethal phenotypes in malaria parasites blood stages with PlasmoGEM and metabolic modeling**
Anush Chiappino-Pepe, Swiss Federal Institute of Technology (EPFL), Switzerland

56. **Engineering the adenylate cyclase toxin for use as a bordetella pertussis vaccine antigen**
Andrea M. DiVenere, The University of Texas at Austin, USA