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

Engineering Conferences International
32 Broadway, Suite 314
New York, NY 10004, USA
Phone: 1-212-514-6760
www.engconfintl.org – info@engconfintl.org
The Duke Hotel Newport Beach
4500 MacArthur Boulevard
Newport Beach, California 92660 USA
+1-949-476-2001
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.

ECI BOARD MEMBERS

Barry C. Buckland, President
Mike Betenbaugh
Nick Clesceri
Peter Gray
Michael King
Raymond McCabe
David Robinson
Eugene Schaefer
P. Somasundaran

Chair of ECI Conferences Committee: Nick Clesceri
ECI Technical Liaison for this conference: Beth Junker

ECI Executive Director: Barbara K. Hickernell
ECI Associate Director: Kevin M. Korpics

©Engineering Conferences International
**Steering Committee**

Michael Betenbaugh (Johns Hopkins University)
Doug Clark (University of California, Berkeley)
George Georgiou (University of Texas)
Theresa Good (National Science Foundation)
Wei-Shou Hu (University of Minnesota)
Beth Junker (BioProcess Advantage, LLC)
Steven Lee (Dr. Reddy’s Laboratories Ltd.)
Costas Maranas (The Pennsylvania State University)
Terry Papoutsakis (University of Delaware)
Anne Robinson (Tulane University)
David Robinson (Robinson Vaccines and Biologics LLC)
Gene Schaefer (J&J Centocor)
Gargi Seth (Intas Pharmaceuticals Ltd.)
Huimin Zhao (University of Illinois)
Weichang Zhou (WuXi AppTec Co., Ltd.)
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 *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

Amgen
Bayer Healthcare
Biomarin
Codiak Biosciences
Genentech
KBI Biopharma Inc.
National Science Foundation
UCB Pharma S.A.
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. Di Venere, 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

              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, Codiaq 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
### Genome Engineering

**Session Chairs:** Mike Betenbaugh, Johns Hopkins University, USA  
Sang Yup Lee, KAIST, Korea

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>17:00 – 17:05</td>
<td>Introduction</td>
</tr>
</tbody>
</table>
| 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
<table>
<thead>
<tr>
<th>Time</th>
<th>Session/Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:00</td>
<td><strong>Synthetic Biology and Network Design</strong></td>
</tr>
<tr>
<td>15:00</td>
<td><strong>Introduction</strong></td>
</tr>
<tr>
<td>15:05</td>
<td>Engineering cyanobacteria for use as photosynthetic chemical factories</td>
</tr>
<tr>
<td>15:05</td>
<td>(Invited)</td>
</tr>
<tr>
<td>15:05</td>
<td>Brian Pfleger, University of Wisconsin-Madison, USA</td>
</tr>
<tr>
<td>15:35</td>
<td>Design of bioswitches for synthetic biology</td>
</tr>
<tr>
<td>15:35</td>
<td>An-Ping Zeng, Hamburg University of Technology, Germany</td>
</tr>
<tr>
<td>15:55</td>
<td>Synthetic biology platforms for natural product biosynthesis and discovery</td>
</tr>
<tr>
<td>15:55</td>
<td>James Payne (Christina Smolke Lab), Stanford University, USA</td>
</tr>
<tr>
<td>16:15</td>
<td>Post-translational strategies for enhancing biosynthetic pathway expression</td>
</tr>
<tr>
<td>16:15</td>
<td>and activity</td>
</tr>
<tr>
<td>16:15</td>
<td>Ian Wheeldon, University of California Riverside, USA</td>
</tr>
<tr>
<td>16:35</td>
<td>Engineering xylose metabolism in Thraustochytrid T18</td>
</tr>
<tr>
<td>16:35</td>
<td>Alexandra Merkx-Jacques, Mara Renewables Corporation, Canada</td>
</tr>
<tr>
<td>16:55</td>
<td>Filling the knowledge gap in metabolism for analyzing biochemical reactions</td>
</tr>
<tr>
<td>16:55</td>
<td>and designing synthetic pathways</td>
</tr>
<tr>
<td>16:55</td>
<td>Vassily Hatzimanikatis, Swiss Federal Institute of Technology (EPFL),</td>
</tr>
<tr>
<td>16:55</td>
<td>Switzerland</td>
</tr>
<tr>
<td>17:15</td>
<td>A CRISPR/Cas9 based engineering tool to activate expression of multiple</td>
</tr>
<tr>
<td>17:15</td>
<td>genes individually or in any specific combination (Poster Spotlights: 5</td>
</tr>
<tr>
<td>17:15</td>
<td>minutes – 3 slides no questions)</td>
</tr>
<tr>
<td>17:15</td>
<td>Peter Eisenhut, Austrian Centre of Industrial Biotechnology, Austria</td>
</tr>
<tr>
<td>17:20</td>
<td>Free Time and Dinner on your own</td>
</tr>
</tbody>
</table>
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 CO₂ production and improved product yields
Shawn W. Jones, White Dog Labs, USA
<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:55 – 15:15</td>
<td>Genes to jeans: A green solution to blue denim</td>
<td>John E. Dueber</td>
<td>University of California, Berkeley, USA</td>
</tr>
<tr>
<td>15:15 – 15:35</td>
<td>Cyclic triterpenoid production with tailored Saccharomyces cerevisiae</td>
<td>Birgitta E. Ebert</td>
<td>RWTH Aachen University, Germany</td>
</tr>
<tr>
<td>15:35 – 15:55</td>
<td>Succinic acid production from pulp and paper industry waste - A transcriptomic approach</td>
<td>Chrysanthi Pateraki</td>
<td>Agricultural University of Athens, Greece</td>
</tr>
<tr>
<td>15:55 – 16:15</td>
<td>A synthetic regulon enhances the fitness of yeast on non-native nutrients</td>
<td>Nikhil Nair</td>
<td>Tufts University, USA</td>
</tr>
<tr>
<td>16:15 – 16:35</td>
<td>Rerouting acetyl-CoA and NADPH to improve lipid and oleochemical production in Yarrowia lipolytica</td>
<td>Peng Xu</td>
<td>University of Maryland Baltimore County, USA</td>
</tr>
<tr>
<td>16:35 – 17:15</td>
<td>Coffee Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17:15 – 18:45</td>
<td>Parallel Workshops</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Workshop 1 – Integrated Continuous Manufacturing</td>
<td>Torrey Pine Room</td>
<td>Marcella Yu (Boehringer Ingelheim, USA) and Paul Wu (Bayer, USA)</td>
</tr>
<tr>
<td></td>
<td>Workshop 2 – Complexities and Challenges of Antibody-Drug Conjugates Development</td>
<td>Bay Laurel Central Room</td>
<td>Robert Herbst and Alex Lazar (Immunogen, USA)</td>
</tr>
<tr>
<td></td>
<td>Workshop 3 – Cell Technologies for Cell Therapies</td>
<td>Bay Laurel South Room</td>
<td>Manuel Carrondo (IBET, Portugal) and Jeff Chalmers (Ohio State University)</td>
</tr>
<tr>
<td>19:00</td>
<td>Dinner, Poster Awards (sponsored by ECI and Biotechnology Journal) and Amgen Award Lecture</td>
<td>Nitya Jacob, Amgen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amgen Award Presentation</td>
<td>Nitya Jacob, Amgen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amgen Award Lecture</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engineered polyketide synthases: Molecular foundries for commodity chemicals, specialty chemicals, and biofuels</td>
<td>Jay Keasling, Lawrence Berkeley National Laboratory, USA</td>
<td></td>
</tr>
</tbody>
</table>
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. **Biosafety 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 Rohllifl, 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