

Program

***Biochemical and Molecular
Engineering XVII
Emerging Frontiers***

**June 26 – 30, 2011
Seattle, Washington, USA**

Conference Chairs:

**François Baneyx
University of Washington**

**Costas D. Maranas
The Pennsylvania State University**

**Beth Junker
Merck & Company**



Engineering Conferences International

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Conference Location (All Sessions and Meals)

Bell Harbor International Conference Center
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Seattle, WA 98121
Phone: 206.441.6666

Conference Hotels

Seattle Waterfront Marriott
2100 Alaskan Way
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Renaissance Seattle Hotel
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Welcome from the Chairs

June 2011

Participants, Colleagues, and Friends,

It is with great pleasure that we welcome you to Seattle, WA for Biochemical and Molecular Engineering XVII. This premier international conference – the seventeenth in the series – brings together established researchers and young investigators from academia and the private sector to discuss the present and chart the future of biochemical engineering. With well over 200 participants and 120 posters, we took great care to ensure that the meeting covers a broad range of topics. As has been the tradition over the past few decades, our goals were to provide: (1) excellence in programming; (2) substantive and selective participation by industry and academia, including a significant number of graduate students; and (3) opportunities to interact in both formal and informal settings.

Many of you will have noticed that the name of the conference was changed to reflect the growing contribution of molecular thinking to the field. With *Emerging Frontiers* as this year's theme, we aim at taking an even broader stock of the trends, technologies, and thought processes that will shape the biochemical engineering of tomorrow. Thus, in addition to forward-looking core sessions (e.g., Technologies for Accelerating Cell Culture Development, Rethinking Process Scale-Up, and Engineering Effective Vaccines), BME XVII features a series of burgeoning topics such as the bio-nano interface, design of biomolecular structures and biological networks, and novel approaches for bioremediation. It is our hope that this blend of traditional and emerging areas will challenge the audience to think of new ways to address problems, cross-pollinate best practices and ideas, and promote in-depth discussions with colleagues from across the US and around the globe.

BME XVII will also continue the celebration of the past, present and future of Biochemical Engineering started by Biochemical Engineering XVI. We will be honoring Michael Shuler for his many contributions to the field by dedicating the *Biomolecular Networks* session to him. We will celebrate the selection of Jens Nielsen as the winner of the prestigious *Amgen Award*. Finally, we will recognize excellence in the next generation by presenting the second *Biochemical Engineering Journal Young Investigator Award* to Kristala Prather-Jones.

We would like to express our deep appreciation to the session chairs whose diligent efforts have enabled the outstanding breadth and quality of talks and posters. We also thank the dedicated ECI staff for facilitating the meeting's organization. Most importantly, we thank the sponsors listed on the following pages: without their generous support, BME XVII would not have been possible. We are also delighted to have as a special guest to the conference Fred Heineken (retired NSF Program Director) who has played a unique role in the community by fostering support for the research of many academics in the Biochemical Engineering community in the US.

Finally, we would like to thank all the speakers, poster authors, and attendees for providing the superb scientific content and interactions that make this meeting so invaluable and productive. We hope you will enjoy the conference and participate to the fullest extent. Thanks for joining us!

François Baneyx, University of Washington
Costas Maranas, The Pennsylvania State University
Beth Junker, Merck & Company

2011 Amgen Biochemical Engineering Award Winner
Professor Jens Nielsen
Chalmers University of Technology

Jens Nielsen has been making significant contributions to the field of Biochemical Engineering since he started working in the field 25 years ago. Jens has been involved in almost every aspect in research and development in Biochemical Engineering. He represents the best of biochemical engineering as his approaches have combined development of experimental tools, analytical technologies, quantitative frameworks, and systems engineering methodologies. .



Three aspects of his professional career distinguish Jens:

1. He has made significant contributions and he has advanced basic and applied research in four of the most complex and the most important microorganisms: *Saccharomyces cerevisiae*, *Aspergillus niger*, *Penicillium chrysogenum*, and lactic acid bacteria. Jens has been the leader in the biochemical engineering of these organisms. In his work using these organisms, he developed and employed innovative experimental, modeling, and computational methodologies, and he demonstrated how these methods can be used in metabolic engineering and bioprocess development for the production of biochemical, pharmaceuticals, and nutraceuticals.
2. He has made contributions in almost every aspect of bioprocess technology: from upstream to downstream process development, from genetics to physiology and bioreactor performance, from process monitoring to transcriptomics and metabolomics. Actually, he is one of the handful of people in the field of biochemical engineering who made significant contributions in so many different areas of the field.
3. He has pioneered the integration of systems engineering methods and approaches for the study of complex biological systems. What characterizes his approaches and contributions is the rigorous application of quantitative experimental methods from transcriptomics, to metabolomics and flux analysis. And his major impact comes from the development of novel mathematical and computational methods, to fruitfully and productively analyze the information from these methods.

Jens started his research career with the development of advanced analytical systems for on-line monitoring of microbial fermentations and the use of hereby obtained data for detailed mathematical modeling of growth and product formation of different cell factories. These activities naturally evolved into studying metabolic pathways in greater details, and his group therefore started to incorporate tools from molecular biology in order to analyze microbial cells in greater details and to be able to perform directed genetic modifications with the objective to improve the properties of industrially important microorganisms. With the development of genomics and functional genomics, he looked into exploiting how tools from this research field can be used in industrial biotechnology, and this established him as a leader in the emerging field of systems biology.

Today his group is one of the largest academic research groups in the field of systems biology of industrial microorganisms. His research activities focus on mapping of molecular interactions in microbial cells through the combination of molecular biology, detailed physiological studies and mathematical modeling. This work is driven by the objective to improve the properties of cell factories used for the biotechnological production of fuels, fine chemicals, food ingredients, nutraceuticals, and pharmaceuticals through metabolic engineering.

Winner of the 2011 Biochemical Engineering Journal Young Investigator Award: Kristala L. Jones Prather

The Editors of the *Biochemical Engineering Journal*, in cooperation with the ECI Biochemical Engineering Conferences Steering Committee, are very pleased to announce the selection of Kristala L. Jones Prather as the recipient of the second Biochemical Engineering Journal Young Investigator Award. This biennial award recognizes outstanding excellence in research and practice contributed to the field of biochemical engineering by a young community member.

Kristala L. Jones Prather is an Associate Professor in the Department of Chemical Engineering at the Massachusetts Institute of Technology (Cambridge, Massachusetts).

Professor Prather received an S.B. in Chemical Engineering from the Massachusetts Institute of Technology and PhD in Chemical Engineering from the University of California, Berkeley. She then spent several years as a Senior Research Biochemical Engineer and Research Fellow with Merck Research Labs (Merck & Co., Inc.). In 2004, she returned to her Alma Mater, MIT, accepting a faculty position within the Department of Chemical Engineering.



Professor Prather's contributions have been recognized in a number of ways, including the MIT School of Engineering Junior Bose Award for Excellence in Teaching (2010), the National Science Foundation CAREER Award (2010), the Technology Review "TR35" Young Innovator Award (2007), the Office of Naval Research Young Investigator Award (2005), and the Camille and Henry Dreyfus Foundation New Faculty Award (2004).

In addition to giving numerous invited lectures and serving on organizing committees for several international meetings, Professor Prather has also been called upon to present testimony on applications of synthetic biology before the Presidential Commission for the Study of Bioethical issues (July 2010, Washington, DC, with Professor George Church of Harvard and Dr. J. Craig Venter of the Venter Institute) and to speak at the National Academy of Science *Kavli Frontiers of Science Symposium* (2010).

Building on her experiences within academia and industry, Professor Prather's current research merges Metabolic Engineering with Synthetic Biology to establish "retro-biosynthesis," a new paradigm aimed at establishing principles and practices for biological pathway design in a manner analogous to the organic chemist's use of retrosynthesis principles.

About the *Biochemical Engineering Journal*

The *Biochemical Engineering Journal* aims to promote progress in the crucial chemical engineering aspects of the development of biological processes associated with everything from raw materials presentation to product recovery relevant to industries as diverse as medical/healthcare, food, and environmental protection. The Journal is well established in areas such as environmental bioengineering, immobilized enzymes and microorganisms, and bioreactor modeling and optimization. The Journal continues to develop its profile to encompass the areas of protein engineering and recombinant protein production, systems biology, metabolic engineering, and cell and tissue engineering. The Impact Factor for the Biochemical Engineering Journal is 2.193*. For more information or for a list of top cited articles, please visit www.elsevier.com/locate/bej.

*@Journal Citation Reports 2010, published by Thomson Reuters.

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Washington Biotechnology & Biomedical Association (WBBA)

Location Notes

Sunday

Registration/Check-in	Outside of Bay Auditorium
Dinner (“Stations”)	Maritime Event Center with museum exhibits
Technical Session	Bay Auditorium
Social Hour and Posters	International Promenade

Monday

Continental Breakfast	International Promenade
Technical Sessions	Bay Auditorium
Morning Coffee Break	International Promenade
Lunch	International Promenade
Afternoon Coffee Break and Posters	International Promenade
Dinner	On your own (local restaurant information at ECI desk)

Tuesday

Continental Breakfast	International Promenade
Technical Sessions	Bay Auditorium
Morning Coffee Break	International Promenade
Lunch	On your own (local restaurant information at ECI desk along with directions to Pike Place Market)
Afternoon Coffee Break and Posters	International Promenade
Dinner	International Promenade
Dessert, Social Hour and Posters	International Promenade

Wednesday

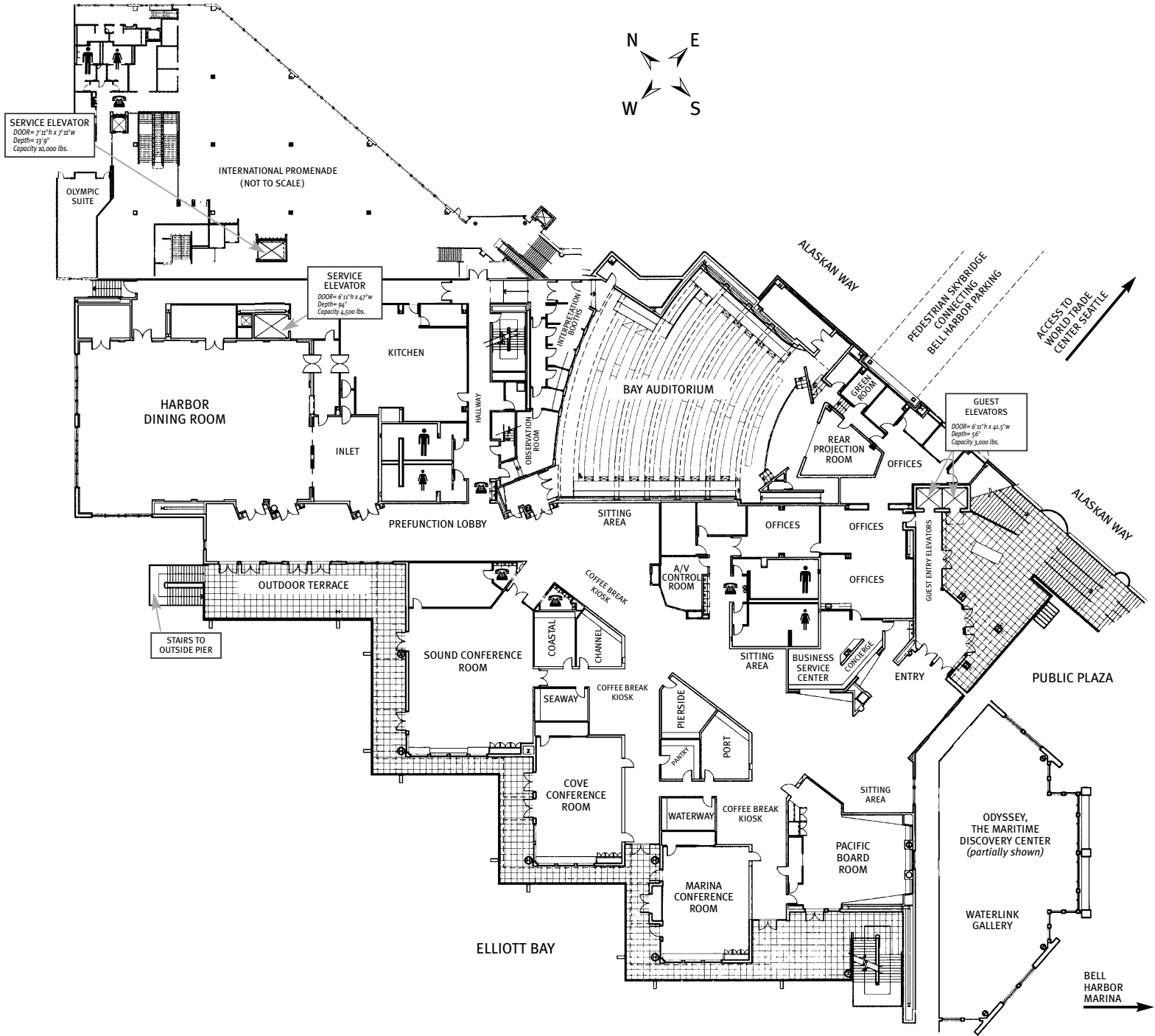
Continental Breakfast	International Promenade
Technical Sessions	Bay Auditorium
Morning Coffee Break	International Promenade
Lunch	Boxed – with option to eat on roof or by water
Afternoon Coffee Break	International Promenade
Reception	North Prefunction Lobby – Finalist Posters on view
Banquet	Harbor Dining Room

NOTES

- *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 5 minutes for questions and discussion.*
- *Please do not smoke at any conference functions.*
- *Turn your cellular telephones to vibrate or off during technical sessions.*
- *Be sure to make any corrections to your name/contact information on the Master Participant List or confirm (by your initials) that the listing is correct. A corrected copy will be sent to all participants after the conference.*

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Monday, June 27, 2011

- 07:00 – 08:00 Breakfast
- 08:00 **Biomolecular Engineering of Biofuels and Commodity Chemicals**
Session Chairs: Brian Pfleger, University of Wisconsin
Jack Newman, Amyris
- Introduction to Session and Speakers
- 08:10 – 08:35 **Computational Methods for Re-Designing Metabolic and Regulatory Networks**
Jennifer Reed, University of Wisconsin-Madison
- 08:35 – 09:00 **Engineering Microorganisms for Production of Advanced Biofuels**
Jay Keasling, University of California Berkeley
- 09:00 – 09:25 **Microbial Fatty Acid Metabolism as a Platform for Fuel and Chemical Production**
Stephen Del Cardayre, LS9
- 09:25 – 09:50 **Sustainable Production of Biolsoprene™ Monomer**
Maggie Cervin, Genencor, Division of Danisco US Inc.
- 09:50 – 10:00 Session Discussion and Questions
- 10:00 – 10:30 Coffee Break / Informal Poster Viewing
- 10:30 **Novel Strategies for Biologics Production**
Session Chairs: Mariajose Castellanos, Univ. of Maryland, Baltimore County
Gunter Jagschies, GE Healthcare Life Science Technologies
- Introduction to Session and Speakers
- 10:40 – 11:05 **A Platform Technology for Cost-Effective Production of Highly Functionalized Biobeads**
Bernd Rehm, PolyBatics Ltd. and Massey University
- 11:05 – 11:30 **Membrane Protein Expression and Characterization: Can We Build a Better Yeast Host through Understanding Protein-Protein Interactions?**
Anne Robinson, University of Delaware
- 11:30 – 11:50 **The Implementation Strategy for Complete Single Use Processing for Biologics Production: Paradigm Shift for Process Development and Manufacturing**
David Pollard, Merck
- 11:55 – 12:20 **High-Throughput Development Strategies to Ensure Knowledge Accumulation for Process Design and Control**
Debby O'Connor, Genentech
- 12:20 – 12:30 Session Discussion and Questions
- 12:30 – 13:30 Lunch

Monday, June 27, 2011 (continued)

- 13:30 **Bioremediation Approaches for the 21st Century**
Session Chairs: Wilfred Chen, University of Delaware
Craig Sandefur, Regenesys

Introduction to Session and Speakers
- 13:40 – 14:05 **Reductive Dehalogenation of TCE: Linking Bioremediation Performance with Molecular Markers**
Marc Deshusses, Duke University
- 14:05 – 14:30 **Free Enzyme Bioremediants for the Triazine Herbicides**
Colin Scott, CSIRO Ecosystem Sciences
- 14:30 – 14:55 **Engineering Enzymes, Bacteria and Plants for the Bioremediation of Explosives**
Neil Bruce, University of York
- 14:55 – 15:20 **Molecular Probing of the Microbial World: Knowledge for Fundamental Environmental Characterization to Managing for Beneficial Use**
Bill Mahaffey, Luca Technologies
- 15:20 – 15:30 Session Discussion and Questions
- 15:30 – 17:00 **Poster Session / Coffee Break**
Presenters of odd numbered posters are asked to stay by their posters
- 17:00 **The Bio-Nano Interface**
Session Chairs: Sang Yup Lee, Korea Advanced Institute of Science and Technology
Pierre Rouviere, Dupont

Introduction to Session and Speakers
- 17:10 – 17:35 **Bionanoscience for Innovative Global Healthcare Research and Technology (BIGHEART)**
Luke P. Lee, University of California Berkeley
- 17:35 – 18:00 **Interrogation of Biological Signaling via Biofabricated Devices**
William Bentley, University of Maryland
- 18:00 – 18:25 **Scaling up Bio-Nanotechnology for Materials Applications**
Pierre Rouviere, DuPont
- 18:25 – 18:50 **Separating Magnetically Labeled and Unlabeled Biological Cells within Microfluidic Channels using Magnetic Nanowires**
Jeffrey Chalmers, Ohio State University
- 18:50 – 19:00 Session Discussion and Questions
- 19:00 – 22:00 Dinner on your own

Tuesday, June 28, 2011

- 07:00 – 08:00 Breakfast
- 08:00 **Design of Biomolecular Structures**
Session Chairs: Scott Banta, Columbia University
Daniela Grabs, Arzeda
- Introduction to Session and Speakers
- 08:10 – 08:35 **Steps Towards Artificial Genomes: De Novo Designed Proteins that Function *in vivo* and Sustain Cell Growth**
Michael Hecht, Princeton University
- 08:35 – 09:00 **Towards Modular Binding of Peptides**
Andreas Plückthun, University of Zurich
- 09:00 – 09:25 **Engineered Peptide Binding Chaperones for Membrane Protein Crystallization**
Jennifer Maynard, University of Texas
- 09:25 – 09:50 **Engineering Enzymes for Improved Activity and Selectivity for the Synthesis of Pharmaceutical Intermediates**
Katarina Midelfort, Pfizer Worldwide Research and Development
- 09:50 – 10:00 Session Discussion and Questions
- 10:00 – 10:30 Coffee Break / Informal Poster Viewing
- 10:30 **Biomolecular Networks (In honor of Professor Mike Shuler)**
Session Chairs: George Georgiou, University of Texas
Anthony Burgard, Genomatica
- Introduction to Session and Speakers
- 10:40 – 11:05 **Signaling Network Regulation of Apoptotic Cell Death**
Doug Lauffenberger, Massachusetts Institute of Technology
- 11:05 – 11:30 **Integrative Genome-Scale Metabolic Analysis of Pathogens for Drug Targeting and Discovery**
Sang-Yup Lee, Korea Advanced Institute of Science and Technology
- 11:30 – 11:55 **Design, Evolution, and Reconstruction of High Flux Microbial Synthesis Networks of Fuels and Chemicals**
James Liao, University of California Los Angeles
- 11:55 – 12:20 **Can We Construct a Living Cell?**
Mike Shuler, Cornell University
- 12:20 – 12:30 Session Discussion and Questions
- 12:30 – 17:00 Lunch on your own
- Coordinated afternoon activities
Free time / Informal Poster Viewing

Tuesday, June 28, 2011 (continued)

- 17:00 **Biomolecular Solutions for Health**
Session Chairs: Jennifer Maynard, University of Texas
 Tom van Blarcom, Pfizer
- Introduction to Session and Speakers
- 17:10 – 17:35 **Engineering Single-Cell Bioanalytic Processes to Resolve Human Immune Responses**
 Chris Love, Massachusetts Institute of Technology
- 17:35 – 18:00 **Novel Technologies for the Detection and Cellular Degradation of Misfolded Proteins**
 Laura Segatori, Rice University
- 18:00 – 18:25 **Trispecific IgG/Fn3-based Antibodies that Strongly Downregulate and Inhibit EGFR**
 Dane Wittrup, Massachusetts Institute of Technology/Adimab
- 18:25 – 18:50 **Application of Human Genetics to Drug Development and Improved Clinical Outcomes**
 David Cox, Pfizer
- 18:50 – 19:00 Session Discussion and Questions
- Introduction of Industrial Keynote**
 Beth Junker, Merck and Co., Inc. and Conference Co-Chair
- 19:00 – 20:00 **Industrial Keynote** – Doug Cameron, Alberti Advisors LLC
Biochemical Engineering and the Re-emerging Bio-based Chemical Industry
- 20:00 – 21:00 Dinner
- 21:00 – 22:30 **Poster Session** with Dessert and Social Hour
Presenters of even numbered posters are asked to stay by their posters

Wednesday, June 29, 2011

- 07:00 – 08:00 Breakfast
- 08:00 **Cell Differentiation Engineering**
Session Chairs: Julie Audet, University of Toronto
Jane Lebkowski, Geron
- Introduction to Session and Speakers
- 08:10 – 08:35 **Engineered Heart Tissue Enables Efficient Interrogation of Differentiation and Integration Potential of Pluripotent Stem Cells in Cardiac Environment**
Milica Radisic, University of Toronto
- 08:35 – 09:00 **Microscale Manipulation of Cells and Their Environment for Controlling Stem Cell Fate**
Joel Voldman, Massachusetts Institute of Technology
- 09:00 – 09:25 **Engineering 3D Pluripotent Stem Cell Microenvironments for Directed Differentiation and Morphogenesis**
Todd McDevitt, Georgia Institute of Technology
- 09:25 – 09:50 **Enabling Scalable Manufacturing Processes for Human Embryonic Stem Cell Derived Cell Therapies**
Erik Whiteley, Geron Corp.
- 09:50 – 10:00 Session Discussion and Questions
- 10:00 – 10:30 Coffee Break / Informal Poster Viewing
- 10:30 **Engineering Effective Vaccines**
Session Chairs: Laura Palomares, Universidad Nacional Autónoma de México
Niranjan Sardesai, Inovio
- Introduction to Session and Speakers
- 10:40 – 11:05 **Plant-made Vaccines and Biopharmaceuticals: A Novel Low Cost Platform Technology**
Henry Daniell, University of Central Florida
- 11:05 – 11:30 **Engineering influenza vaccines to overcome antigenic change**
Philip R. Dormitzer, Novartis Vaccines and Diagnostics
- 11:30 – 11:55 **Biochemical and Molecular Engineering of Virus-Like Particle Vaccines**
Anton Middleberg, University of Queensland
- 11:55 – 12:20 **Engineering Consensus DNA Vaccines for Increased Breadth and Magnitude of Immune Responses**
Niranjan Sardesai, Inovio
- 12:20 – 12:30 Session Discussion and Questions
- 12:30 – 13:30 Box lunch / Informal Poster Viewing

Wednesday, June 29, 2011 (continued)

- 13:30 **Rethinking Process Scale-Up**
Session Chairs: Jim Swartz, Stanford University
 Jason Carstens, Fred Hutchinson Cancer Research Center
- Introduction to Session and Speakers
- 13:40 – 14:05 **Using Small Scale Studies to Optimize Process Operational Parameters for the Purposes of Scaling the Process to Manufacturing Scale in a Cost and Time-Efficient Manner**
Tim Lee, Sanofi-Pasteur
- 14:05 – 14:30 **A Cell Free Scalable Biochemical Protein Synthesis Platform**
Henry Heinsohn, Sutro Biopharma
- 14:30 – 14:55 **Developing a Renewable Oil Manufacturing Process from Microalgae**
Peter Licari, Solazyme
- 14:55 – 15:05 Session Discussion and Questions
- 15:05 – 15:35 Coffee Break (sponsored by DSM) / Informal Poster Viewing
- 15:35 **Technologies for Accelerating Cell Culture Development**
Session Chairs: Ryan Gill, University of Colorado
 Chetan Goudar, Bayer
- Introduction to Session and Speakers
- 15:35 – 16:00 **The International Community's Effort to Sequence the CHO Genome**
Kelvin H. Lee, University of Delaware
- 16:00 – 16:25 **CHO Systems Biotechnology Approaches for Rational Biopharmaceutical Process Development**
Jochen Schaub, Boehringer Ingelheim
- 16:25 – 16:50 **Using Zinc-Finger Nucleases (ZFNs) for Cell Engineering in Chinese Hamster Ovary (CHO) Cells**
Henry George, Sigma-Aldrich Corporation
- 16:50 – 17:15 **Enabling Technologies for Isolation of High Production Cell-Lines with Desired Product Quality Attributes**
Mirna Mujacic, Amgen
- 17:15 – 17:25 Session Discussion and Questions
- 17:25 **Introduction to Amgen Award Lecture**
James Thomas, Amgen
- 17:30 – 18:30 **Amgen Award Lecture**
Metabolic Engineering, Synthetic Biology, Systems Biology,...What is the Role of Biochemical Engineering?
Jens Nielsen, Chalmers University of Technology

Wednesday, June 29, 2011 (continued)

18:30 – 19:30 Break to prepare for Banquet

19:30 – 20:30 Reception

Finalist posters on view in Harbor Lobby

20:30 – 21:30 Banquet

21:30 – 21:50 **Amgen Award Winner roast**

21:50 – 22:00 **Conference Closing Remarks**

Costas Maranas, Conference Chair and David Robinson, ECI

Biochemical and Molecular Engineering XVII

Emerging Frontiers

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Poster List

1. **SIMPLER IS BETTER: HIGH-EFFICIENCY BIOFUELS PRODUCTION BY IN VITRO SYNTHETIC BIOLOGY APPROACHES**
Y-H Percival Zhang, Virginia Tech
2. **CELLULASE ENGINEERING FROM INDIVIDUAL PARTS TO THEIR COMPLEXES – CELLULOSOME TO RECOMBINANT CELLULOLYTIC BACILLUS SUBTILIS**
Y-H Percival Zhang, Virginia Tech
3. **DIRECTED EVOLUTION VIA TRACKABLE MULTIPLEX RECOMBINEERING**
Ryan T. Gill, University of Colorado at Boulder
4. **OVER-EXPRESSION OF KEY GENES FOR THE DEVELOPMENT OF ROBUST SACCHAROMYCES CEREVISIAE STRAINS FOR CELLULOSIC ETHANOL PRODUCTION**
Pedro Pena, University of Minnesota
5. **SENSORS FOR SINGLE CELL ISOLATION OF METABOLITE PRODUCING BACTERIA**
Stephan Binder, Biotechnology, IBG-1, Research Centre Jülich
6. **PRODUCTION OF SUCCINIC ACID USING ACETIC ACID AS CARBON SOURCE BY ESCHERICHIA COLI NZN111**
Zhimin Li, East China University of Science and Technology
7. **INCREASING LONG CHAIN FATTY ACID PRODUCTION BY ENGINEERING FATTY ACID SYNTHESIS (FAS) FROM ESCHERICHIA COLI**
Eunyoung Jeon, Sogang University
8. **IDENTIFICATION AND UTILIZATION OF 2,3-BUTANEDIOL RELATED GENES FOR PRODUCTION OF 2,3-BUTANEDIOL IN KLESIELLA PNEUMONIA AND KLESIELLA OXYTOCA**
Soojin Lee, Sogang University
9. **2,3-BDO PRODUCTION FROM KLEBSIELLA PNEUMONIAE, KLEBSIELLA OXYTOCA AND ENTEROBACTER ASBURIAE BY ALTERING PH CONDITIONS**
Mingshou Lu, Sogang University
10. **DEVELOPMENT OF RECOMBINANT ESCHERICHIA COLI STRAINS FOR IMPROVING OF FATTY ACID SYNTHESIS (FAS)**
Sunhee Lee, Sogang University
11. **GENETIC IDENTIFICATION AND CHARACTERIZATION OF NOVEL CELLULASES AND CELLULOLYTIC COMPLEXES FROM ANAEROBIC FUNGI**
Michelle A. O'Malley, Massachusetts Institute of Technology

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12. **METABOLIC ENGINEERING OF BACTERIA FOR SUSTAINABLE PRODUCTION OF FATTY ACID DERIVED PRODUCTS**
Brian Pflieger, University of Wisconsin Madison
13. **TRANSCRIPTIONAL MICROBIAL ALLOYS: ENABLING E. COLI TO RECOGNIZE LACTOBACILLUS PLANTARUM PROMOTERS FOR DEVELOPING COMPLEX MICROBIAL PHENOTYPES**
Stefan M. Gaida, University of Delaware
14. **FERMENTATION OF SUGAR MIXTURES FOUND IN LIGNOCELLULOSIC HYDROLYSATE**
Tian Xia, University of Georgia
15. **IMPROVED SODIUM ION TOLERANCE OF ESCHERICHIA COLI**
Xianghao Wu, University of Georgia
16. **SYSTEMS METABOLIC ENGINEERING OF ESCHERICHIA COLI FOR THE EFFICIENT PRODUCTION OF PUTRESCINE: A FOUR CARBON LINEAR CHAIN DIAMINE**
Xiao-Xia Xia, Korea Advanced Institute of Science and Technology (KAIST)
17. **PRODUCTION OF LARGE SPIDER DRAGLINE SILK PROTEINS IN METABOLICALLY ENGINEERED ESCHERICHIA COLI TO SPIN INTO A NATIVE QUALITY SILK FIBER**
Xiao-Xia Xia, Korea Advanced Institute of Science and Technology (KAIST)
18. **SENSORS FOR SINGLE CELL ISOLATION OF METABOLITE PRODUCING BACTERIA**
Stephan Binder, Forschungszentrum Jülich GmbH, IBG-1: Biotechnology
19. **APPLICATIONS OF ENZYMATIC POLYMERIZATION IN PAPER AND WOOD INDUSTRY**
Diego Moldes, University of Vigo
20. **TUNING GLYCOLYSIS FOR HETEROLOGOUS PRODUCTION**
Kevin Solomon, SynBERC, Massachusetts Institute of Technology
21. **METABOLIC CONTROL AND BIOFUEL OUTCOMES IN CHLAMYDOMONAS REINHARDTII**
Mariajose Castellanos, University of Maryland
22. **IMPROVEMENT OF YEAST BUTANOL TOLERANCE**
Payam Ghiasi, Chalmers University of Technology

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23. **EVALUATION OF THE ROLE OF NITROGEN UTILIZATION EFFICIENCY IN DETERMINING APPARENT ETHANOL TOLERANCE IN SACCHAROMYCES CEREVISIAE**
Michelle Lozada-Contreras, University of California, Davis
24. **MICROBIAL PRODUCTION OF STYRENE FROM RENEWABLE RESOURCES**
David Nielsen, Arizona State University
25. **UTR DESIGNER: A PREDICTIVE DESIGN METHOD TO CONTROL THE GENE EXPRESSION IN ESCHERICHIA COLI**
Sang Woo Seo, Pohang University of Science and Technology (POSTECH)
26. **METABOLIC ENGINEERING OF PATHWAYS IN CYANOBACTERIA SYNECHOCYSTIS PCC 6803**
Yi Ern Cheah, Colorado State University
27. **FROM SYSTEMS TO SYNTHETIC BIOLOGY: RECONSTRUCTION OF BACTERIAL MEP PATHWAY IN SACCHAROMYCES CEREVISIAE**
Siavash Partow, Chalmers University of Technology
28. **DEVELOPMENT OF A BIOPLASTIC SECRETION SYSTEM**
Charles Miller, Utah State University
29. **REITERATIVE RECOMBINATION FOR COMBINATORIAL OPTIMIZATION OF YEAST METABOLIC FLUX FOR TERPENOID PRODUCTION**
Nili Ostrov, Columbia University
30. **YEAST PERFUME FACTORY: METABOLIC ENGINEERING OF SACCHAROMYCES CEREVISIAE FOR PLANT ISOPRENOID BIOSYNTHESIS**
Gionata Scalcinati, Chalmers University of Technology
31. **REPLACING GLYCOLYSIS OF SACCHAROMYCES CEREVISIAE WITH A SYNTHETIC PATHWAY FOR CATABOLISM OF GLUCOSE**
Marta Papini, Chalmers University of Technology
32. **STATISTICS-BASED LINEAR MODEL FOR PREDICTION OF CHEMICAL BIOSYNTHESIS YIELDS**
Yinjie Tang, Washington University in St. Louis
33. **OPTIMIZATION OF GENERAL METABOLIC ENGINEERING TECHNIQUES IN THE PHOTOSYNTHETIC CYANOBACTERIUM SYNECHOCYSTIS SP. PCC 6803**
Stevan Albers, Colorado State University
34. **A SYNTHETIC GENETICALLY-ENCODED CELL STATE CONTROLLER**
Felix Moser, University of California, San Francisco

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