Program

Integrated Continuous Biomanufacturing III

September 17 - 21, 2017

Hotel Cascais Miragem
Cascais, Portugal

Conference Co-Chairs

Suzanne Farid, University College London, United Kingdom
Chetan Goudar, Amgen, USA
Paula Alves, IBET, Portugal
Veena Warikoo, Axcella Health, Inc., USA

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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.

Steering Committee

Paula Alves (IBET)

Barry Buckland (BiologicsB LLC)

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Chetan Goudar (Amgen)

Christopher Hwang (Genzyme-Sanofi)

Konstantin Konstantinov (Genzyme-Sanofi)

Karol Lacki (Novo Nordisk)

Nigel Titchener-Hooker (University College London)

Veena Warikoo (Axcella Health)

Previous conference in this series

Integrated Continuous Biomanufacturing
October 20 - 24, 2013
Castelldefels, Spain

Conference Chairs:
Konstantin Konstantinov, Genzyme-Sanofi, USA
Chetan Goudar, Amgen, USA
Nigel Titchener-Hooker, University College London, UK

Integrated Continuous Biomanufacturing II
November 1 - 5, 2015
Berkeley, California, USA

Conference Chairs:
Chetan Goudar, Amgen, USA
Suzanne Farid, University College London, UK
Christopher Hwang, Genzyme-Sanofi, USA
Karol Lacki, Novo Nordisk, Denmark

INTEGRATED CONTINUOUS BIOMANUFACTURING AWARD WINNER

KONSTANTIN B. KONSTANTINOV

Engineering Conferences International (ECI) is very pleased to announce the creation of an award for the very successful conference series on Integrated Continuous Biomanufacturing (ICB). The first award will be given to **Konstantin Konstantinov** in recognition of his vision and effort to create this conference series and for his multiple contributions to the field. This award will be presented to Konstantin at ICB III.

Konstantin will give a keynote lecture and chair a committee to select future winners of this award.

Konstantin continues to makes differentiating contributions to process development and commercialization activities for multiple new products through his over 50 Peer Reviewed publications and his many conference contributions. This activity was recently recognized by the Cell Culture Engineering (CCE) community and Konstantin was selected from many contenders as the 2016 recipient of the Conference award which was presented to him in May at CCE XV in La Quinta, California.

We anticipate that the Integrated Continuous Biomanufacturing Conference will grow in importance over future years.

Conference Sponsors

Amgen

Boehringer Ingelheim

GE Healthcare

Merck

Pfizer

Sartorius Stedim Biotech

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Bill & Melinda Gates Foundation

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Regeneron Pharmaceuticals, Inc.

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Sanofi

Shire

UCB Pharma

Amicus Therapeutics

Bayer

Momenta

Semba Biosciences, Inc.

Wuxi Biologics

NOTES

- *Technical Sessions will be in Rooms I and II. Poster sessions will be in Room III.*
- *All meals will be on the 3rd Floor, with the exception of the conference banquet on Wednesday.*
- *The ECI office will be in Room XI.*
- *The gala dinner will be in Rooms I and II.*
- *Workshop locations will be announced on site.*
- *Audio, still photo and video recording by any device (e.g., cameras, cell phones, laptops, PDAs, watches) is strictly prohibited during the technical sessions, unless prior permission has been granted by the author and ECI.*
- *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.*

Workshop Topics

Workshop 1: Increasing Speed to Clinic with Continuous Biomanufacture
Chairs: **Todd Przybycien**, Carnegie Mellon University, USA
Jon Coffman, Boehringer Ingelheim Pharma, USA

Workshop 2: Evaluating Future Facility Design Concepts
Chairs: **Suzanne Farid**, University College London, United Kingdom
Michael Borys, Bristol-Myers Squibb, USA

Workshop 3: Gearing Up for Process Performance Qualification Readiness for ICB
Chairs: **Mark Brower,** MSD, USA
Jeff Salm, Pfizer, USA

Workshop 4: Industry-Academia-Vendor-Government Collaboration in the ICB Space
Chairs: **Alessandro Butte,** ETH Zurich, Switzerland
Alex Xenopoulos, EMD Millipore, USA

Sunday, September 17, 2017

14:00 – 16:15	Conference Check-in
16:15 – 16:30	Welcome – Conference Chairs and ECI Liaison
16:30 – 17:15	**Keynote Lecture 1** **Are we prepared to meet the demands of a challenging, but promising future?** James Thomas, Just Biotherapeutics, Inc. USA
17.15 – 17.45	*Break*
17:45 – 19:15	**Workshops** (2 in parallel) **Workshop 2: Evaluating Future Facility Design Concepts** (XII+XIII) Chairs: **Suzanne Farid**, University College London, United Kingdom **Michael Borys**, Bristol-Myers Squibb, USA **Workshop 3: Gearing Up for Process Performance Qualification Readiness for ICB** (XV) Chairs: **Mark Brower,** MSD, USA **Jeff Salm,** Pfizer, USA
19:30 – 21:30	*Dinner*
21.30 – 23.00	*Social Hour*

Monday, September 18, 2017

07:30 – 09:00	*Breakfast*
	Session 1: Continuous Culture to Capture **(Sponsored by Pfizer)** Chairs: **Martina Micheletti**, University College London (UCL), United Kingdom **Jason Walther,** Sanofi, USA. **Thomas Ryll**, Immunogen, USA
09:00 – 09:25	**Continuous bioprocessing for biologics manufacturing** Weichang Zhou, WuXi Biologics, China
09:25 – 09:50	**Development of highly intensified cell culture perfusion media and process with tremendous productivity potential, while having a low cell bleed requirement for maintaining an overall high yield** Henry Lin, Boehringer Ingelheim, USA
09:50 – 10:15	**Scalable technologies for process intensification in the continuous biomanufacturing factories of the future** Gerben Zijlstra, Sartorius, Germany
10:15 – 10:40	**Process development in screening scale bioreactors and perspectives for very high cell density perfusion** Veronique Chotteau, KTH, Sweden
10:40 – 11:05	**Evaluating options objectively – Resisting the "purist" approach to arrive at the most productive, robust, and practically implementable perfusion utilizing processes** Gregory Hiller, Pfizer, Inc., USA
11:05 – 11:45	*Coffee / Networking Break*
11:45 – 12:30	**Keynote Lecture 2** **Systemic rejuvenation: From blood to molecular therapies** Ludwig Aigner, Paracelsus Medical University Salzburg, Austria
12:30 – 13:45	*Lunch*
	Session 2: Continuous Purification and Drug Product Sequences **(Sponsored by Amgen)** Chairs: **Manuel Carrondo**, iBET, Portugal **Art Hewig, Amgen**, USA
13:45 – 14:10	**Development of continuous production and purification processes for the integrated manufacture of monoclonal antibodies** Massimo Morbidelli, ETH Zürich, Switzerland
14:10 – 14:35	**From development to implementation with a fully integrated downstream bioprocess** Jeff Salm, Pfizer, USA
14:35 – 15:00	**Process intensification: Enabling technologies and methodologies** Jean-Marc Bielser / Jonathan Souquet, Merck KGaA, Switzerland
15:00 – 15:25	**A disruptive alternative to semi-continuous multi-column chromatography (MCC) processes** Michael Rose, UCB, United Kingdom
15:25 – 15:50	**Multi-column chromatographic purification of influenza virus-like particles** Ricardo Silva, iBET, Portugal

Monday, September 18, 2017 (continued)

15:50 – 16:45	*Coffee / Networking Break*
16:45 – 18:00	**Poster Snapshot Session** Chairs: **Alois Jungbauer**, BOKU, Austria **Veronique Chotteau**, KTH, Sweden **Natalia Gomez**, Amgen, USA **Jarno Robin**, Sanofi, France
16:45 – 16:50	**Fouling mitigation in membrane based perfusion systems by oscillating tangential flow** Maria Weinberger, Technical University of Munich, Germany
16:50 – 16:55	**Bioprocess intensification and optimisation using macroscopic predictive models of cell culture processes** Bassem Ben Yahia, UCB Pharma S.A., Belgium
16:55 – 17:00	**Use of a biphasic perfusion process based on mild hypothermia for recombinant glucocerebrosidase (GBA) production** Filipa Gonçalves, Instituto Superior Técnico, Portugal
17:00 – 17:05	**Ultra scale-down mimics for perfusion culture: Experimental study for rapid biopharmaceutical process development** Molly Tregidgo, University College London, United Kingdom
17:05 – 17:10	**Evaluation of pseudo-perfusion feeding strategies for mAb production using a CHO cell line adapted to concentrated feed media** Leda Castilho, Federal University of Rio de Janeiro, Brazil
17:10 – 17:15	**Conversion of an industrial batch separation process to an autonomous integrated downstream process – A case study** Anton Lofgren, Lund University, Sweden
17:15 – 17:20	**Continuous protein precipitation – A robust antibody purification method without the need for steady state conditions during continuous integrated production.** Daniel Burgstaller, University of Natural Resources and Life Sciences, Vienna, Austria
17:20 – 17:25	**Continuous extraction strategies for monoclonal antibodies: From macro- to micro-scale** Ana Margarida Azevedo, Instituto Superior Técnico, Portugal
17:25 – 17:30	**Design of a novel continuous flow reactor for low pH viral inactivation** Stephanie A. Parker, Keck Graduate Institute, USA
17:30 – 17:35	**Supervisory control of integrated continuous downstream processes** Bernt Nilsson, Lund University, Sweden
17:35 – 17:40	**Digitalization platform and supervisory control of a continuous integrated bioprocess based on Raman spectroscopy** Fabian Feidl, ETH Zürich, Switzerland
17:40 – 17:45	**Up and down scale considerations for the continuous production of glycooptimized biopharmaceuticals** Vicky Goralczyk, Glycotope GmbH, Germany
17:45 – 17:50	**Scalable lentiviral vector production using stable producer cell lines in perfusion mode** Aziza Manceur, National Research Council Canada, Canada

Monday, September 18, 2017 (continued)

17:50 – 17:55	**Continuous gas processing without bubbles using thin liquid film bioreactors containing biocomposite biocatalysts** Michael C. Flickinger, North Carolina State University, USA
17:55 – 18:00	**Enabling next-generation cell line development using continuous perfusion and nanofluidic technologies** Chetan Goudar, Amgen, USA
18:00 – 19:00	*Free Time*
19:00 – 20:30	*Dinner*
20:30 – 22:30	**Poster Session** with dessert and Social Hour

Tuesday, September 19, 2017

07:30 – 09:00	*Breakfast*
	Session 3: End-to-end Continuous Biomanufacture **(Sponsored by Boehringer Ingleheim)** Chairs: **Massimo Morbidelli**, ETH Zurich, Switzerland **Rohan Patil**, Sanofi, USA
09:00 – 09:25	**Towards the implementation of a continuous bioprocess in single use technology** Jorgen Magnus / Thomas Daszkowski, Bayer, Germany
09:25 – 09:50	**Implementation of an end-to-end continuous bioprocessing platform using novel technologies** Peter Levison, Pall Life Sciences, United Kingdom
09:50 – 10:15	**Fully integrated continuous antibody processing demonstrates improved productivity** Kenneth Lee, MedImmune LLC, USA
10:15 – 10:40	**Balancing continuous, integrated, and batch processing** Jonathan Coffman, Boehringer Ingelheim, USA
10:40 – 11:05	**Continuous freeze-drying and its relevance to the pharma/biotech industry** Roberto Pisano, Politecnico di Torino, Italy
11:05 – 11:45	*Coffee / Networking Break*
11:45 – 12:30	**Keynote Lecture 3** **Continuous manufacturing - EMA perspective and experience** Nino Mihokovic, European Medicines Agency, United Kingdom
12:30 – 13:30	*Lunch*
13:30 – 15:00	**Poster Session** with dessert and Social Hour Chairs: **Alois Jungbauer**, BOKU, Austria **Veronique Chotteau**, KTH, Sweden **Natalia Gomez**, Amgen, USA **Jarno Robin**, Sanofi, France
15.00 – 22:00	*Excursion and Dinner on your own before returning to hotel*

Wednesday, September 20, 2017

07:30 – 09:00	*Breakfast*
	Session 4: Predictive Continuous QbD Case Studies **(Sponsored by Sartorius Stedim Biotech)** Chairs: **Naz Karim**, Texas A&M University, USA **Dorothee Ambrosius**, Boehringher Ingelheim Pharma, Germany
09:00 – 09:25	**Continuous bioprocessing and process analytical technologies: A path towards quality by design** Nuno Pinto, Merck & Co., Inc., USA
09:25 – 09:50	**Commercialization of a 2nd generation intensified perfusion process during life cycle management** Jiuyi Lu, Sanofi, USA
09:50 – 10:15	**Regulatory aspects of continuous downstream processing** Marc Bisschops, Pall Corporation, Netherlands
10:15 – 10:40	**Integrating analysis with process control for continuous bioprocessing: Extending the lifecycle concept to process analytical technologies** Jose Menezes, Instituto Superior Tecnico & 4Tune Engineering Ltd, Portugal
10:40 – 11:05	**A comprehensive study in PAT-applications for a QbD-compliant development of continuous biopharmaceutical production** Reiner Luttmann, Hamburg University of Applied Sciences, Germany
11:05 – 11:45	*Coffee / Networking Break*
11:45 – 13.15	**Workshops** (2 in parallel)
	Workshop 1: Increasing Speed to Clinic with Continuous Biomanufacture (XII+XIII) Chairs: **Todd Przybycien**, Carnegie Mellon University, USA **Jon Coffman**, Boehringer Ingelheim Pharma, USA
	Workshop 4: Industry-Academia-Vendor-Government Collaboration in the ICB Space (XV) Chairs: **Alessandro Butte,** ETH Zurich, Switzerland **Alex Xenopoulos,** EMD Millipore, USA
13:15 – 14:30	*Lunch*
	Session 5: Business Case for Facilities of the Future **(Sponsored by Merck)** Chairs: **Alex Kiparissides / Nigel Titchener-Hooker**, University College London (UCL), United Kingdom **Thomas Sauer**, Sanofi, Germany
14:30 – 14:55	**Delivering a toolbox of flexible platforms for clinical and commercial bioprocessing production: 'Defining the business drivers for development and implementation'** Mark Brower, Merck & Co Inc, USA
14:55 – 15:20	**Are integrated processes a solution looking for a problem to solve, or a tool to solve the problem?** Joseph Shultz, Novartis Pharma AG, Switzerland
15:20 – 15:45	**Process economics in biologics manufacturing** John Machulski, Sanofi, USA

Wednesday, September 20, 2017 (continued)

15:45 – 16:10	**Next generation manufacturing for biologics: Integration of a hybrid model for continuous manufacturing concepts into a clinical facility** Michael Borys, Bristol-Myers Squibb, USA
16:10 –16:30	*Coffee / Networking Break*
	Session 6: Continuous Biomanufacture Beyond CHO or Proteins **(Sponsored by GE Healthcare)** Chairs: **Chris Love**, Massachusetts Institute of Technology, USA **Uwe Gottschalk**, Lonza, Switzerland
16:30 – 16:55	**Beyond CHO – Non-mammalian hosts could be the future expression systems of choice for recombinant biotherapeutics** Chapman Wright, Biogen, USA
16:55 – 17:20	**Integrated manufacturing with microbial hosts for fast process development and production** J. Christopher Love, Massachusetts Institute of Technology, USA
17:20 – 17:45	**Continuous biomanufacturing concepts for cell therapy processes** Erika M. McAfee, Lonza Walkersville, Inc., USA
17:45 – 18:10	**Bioprocess intensification for the continuous expansion of 3D human induced pluripotent stem cell aggregates in bioreactors** Bernardo Abecasis, IBET, Portugal
18:10 –18:25	*Stretch Break*
18:25 – 19:00	**Keynote Lecture 4 (ICB Award Lecture)** **Development and large scale manufacturing of exosome-based therapeutics** Konstantin Konstantinov, Codiak Biosciences, USA
19:00 – 19:45	*Free Time*
19:45 – 20:30	*Reception*
20:30 – 22:30	*Conference Banquet and Awards*
22.30 – 23.30	*Social Hour*

Thursday, September 21, 2017

07:00 – 09:30 Breakfast and departures

Poster Presentations

Continuous Culture to Capture

1. **Optimizing media for perfusion combining predictive scale-down models and multivariate approaches**
   Jochen Sieck, Merck KGaA, Germany

2. **Development of a scale down toolbox for perfusion process development**
   Jean-Marc Bielser, Merck KGaA, Switzerland

3. **Development and application of screening scale bioreactor systems for very high cell density perfusion of mammalian cells**
   Caijuan Zhan, KTH - Cell Technology Group (CETEG), Sweden

4. **Fouling mitigation in membrane based perfusion systems by oscillating tangential flow**
   Maria Weinberger, Technical University of Munich, Germany

5. **Bioprocess intensification and optimisation using macroscopic predictive models of cell culture processes**
   Bassem Ben Yahia, UCB Pharma S.A., Belgium

6. **Ultra scale-down mimics for perfusion culture: Experimental study for rapid biopharmaceutical process development**
   Molly Tregidgo, University College London, United Kingdom

7. **Evaluation of pseudo-perfusion feeding strategies for mAb production using a CHO cell line adapted to concentrated feed media**
   Leda Castilho, Federal University of Rio de Janeiro, Brazil

8. **Use of a biphasic perfusion process based on mild hypothermia for recombinant glucocerebrosidase (GBA) production**
   Filipa Gonçalves, Instituto Superior Técnico, Portugal

9. **Enhancing crispr-mediated CHO cell antibody productivity through concentrated fed-batch or continuous perfusion**
   Ching-Jen Yang, Development Center for Biotechnology, Taiwan

10. **Evaluation of cell culture with a simulated continuous manufacturing (sCM) process in 50mL tubespins for clone selection**
    Natalia Gomez, Amgen, USA

11. **Screening cell growth in simulated continuous manufacturing spin tubes determines optimal media conditions for cell lines**
    Jonathan Lull, Amgen, USA

12. **Development of a novel automated perfusion mini bioreactor 'ambr® 250 perfusion'**
    Barney Zoro, Sartorius Royston, United Kingdom

13. **More than 15 years of continuous processing using chemostat cultures. A Shire niche?**
    Daniel Fleischanderl, Shire, Austria

14. **Small-scale development and optimization of stirred tank mammalian cell perfusion cultures**
    Moritz Wolf, ETH Zurich, Switzerland

15. **Intensification of a multi-product perfusion platform through medium and process development**
    Shawn Barrett, Sanofi, USA

16. **Computational Fluid Dynamics (CFD) modelling and experimental confirmation of hollow fiber tangential flow filtration (HFTFF) and alternating tangential flow filtration (ATF) In a perfusion bioreactor**
    Flaka Radoniqi, Keck Graduate Institute and Boehringer Ingelheim, USA

17. **Up and down scale considerations for the continuous production of glycooptimized biopharmaceuticals**
    Vicky Goralczyk, Glycotope GmbH, Germany

18. **Ultra scale-down concepts to address early stage process development challenges in integrated continuous bioprocessing**
    Andrea Rayat, University College London, United Kingdom

<u>Continuous Purification and Drug Product Sequences</u>

19. **Continuous protein precipitation – A robust antibody purification method without the need for steady state conditions during continuous integrated production**
    Daniel Burgstaller, University of Natural Resources and Life Sciences, Vienna, Austria

20. **Continuous in-line virus inactivation for next generation bioprocessing**
    Melissa Holstein, MilliporeSigma, USA

21. **Consideration of filter design space for validation of virus filtration in continuous processing applications**
    Nigel Jackson, Pall Life Sciences, United Kingdom

22. **Impact of product and recycle times in MCSGP polishing on charge variant separation**
    Sebastian Vogg, ETH Zurich, Switzerland

23. **Novel single-column simulated moving-bed chromatography platform for quasi-continuous biopurification**
    José P. B. Mota, LAQV-REQUIMTE, FCT-UNL, Portugal

24. **Design of a novel continuous flow reactor for low pH viral inactivation**
    Stephanie A. Parker, Keck Graduate Institute, USA

25. **Progress towards continuous aqueous two-phase extraction via TAPPIR**
    Andreas Bommarius, Georgia Institute of Technology, USA

26. **Continuous extraction strategies for monoclonal antibodies: From macro- to micro-scale**
    Ana Margarida Azevedo, Instituto Superior Técnico, Portugal

27. **Enabling end-to-end continuous biomanufacturing by exploring integration approaches of continuous TFF**
    Eva Udovic, University of Ljubljana, Slovenia

28. **Viral clearance considerations for continuous viral inactivation**
    Raquel Orozco, Boehringer Ingelheim, USA

29. **Conversion of an industrial batch separation process to an autonomous integrated downstream process – A case study**
    Anton Lofgren, Lund University, Sweden

30. **Much-efficient and cost-effective manufacturing of antibody biotherapeutics employing integrated negative chromatography technology**
    Razwan Hanif, UCB, United Kingdom

31. **A fully continuous downstream process concept without column chromatography**
    Todd Przybycien, Carnegie Mellon University, USA

32. **Dynamic process control of twin-column periodic countercurrent chromatography processes**
    Thomas Muller-Spath, ETH Zurich, Switzerland

End-to-end Continuous Biomanufacture

33. **Application of single pass TFF to enable intensified and continuous biological manufacturing**
    Herbert Lutz, MilliporeSigma, USA

34. **Development of an N-1 perfusion process and optimized scale-down models for implementation in a platform CHO cell culture manufacturing process**
    Frank V. Ritacco, Bristol-Myers Squibb, USA

35. **Process considerations for Protein A affinity capture, virus inactivation, and linked polishing steps in multi-column continuous purification of monoclonal antibodies**
    Robert Mierendorf, Semba Biosciences, Inc., USA

36. **Continuous purification of monoclonal antibody using periodic counter-current chromatography**
    Wei-Kuang Chi, Development Center for Biotechnology, Taiwan

37. **Clarification and capture of a CHO-derived monoclonal antibody through flocculation and AEX processes**
    Rimenys J. Carvalho/Leda Castilho, Federal University of Rio de Janeiro (UFRJ), COPPE, Brazil

Predictive Continuous QbD Case Studies

38. **Supervisory control of integrated continuous downstream processes**
    Bernt Nilsson, Lund University, Sweden

39. **Process analytical technologies for a continuous capture and connected downstream process**
    Nina Brestrich/Joseph Shultz, Novartis Pharma AG, Switzerland

40. **Digitalization platform and supervisory control of a continuous integrated bioprocess based on raman spectroscopy**
    Fabian Feidl, ETH Zürich, Switzerland

41. **Process analytical technology (PAT) in continuous bioprocessing**
    Edita Botonjic-Sehic, Pall Life Sciences, USA

42. **Qualification of single use in-line sensors for use in continuous bioprocessing**
James Furey, PendoTECH, USA

43. **Time-series datamining for continuous bioprocess analysis**
Yang Yang, University College London, United Kingdom

44. **Enhancing multivariate calibration model reproducibility for the online monitoring of upstream processes in continuous biomanufacturing**
Nicholas A. Trunfio, University of Massachusetts - Lowell, U.S. Food and Drug Administration, USA

45. **FDA/OBP laboratory research to support continuous bioprocessing**
Scott Lute, U.S. FDA, CDER/OBP, USA

Business Case for Facilities of the Future

46. **Cost modeling of an integrated, continuous downstream mAb platform**
Mark Schofield, Pall Life Sciences, USA

47. **Facility design concepts for adoptive T-cell immunotherapy**
Tania Pereira Chilima, UCL, United Kingdom

Continuous Biomanufacture Beyond CHO or Proteins

48. **Continuous desalting of refolding solution by ion exchange chromatography**
Nicole Walch, Austrian Centre of Industrial Biotechnology, Austria

49. **Continuous gas processing without bubbles using thin liquid film bioreactors containing biocomposite biocatalysts**
Michael C. Flickinger, North Carolina State University, USA

50. **Novel concepts for efficient and predictable membrane separation in continuous cell retention and downstream processing**
Ulrich Kulozik, Technical University of Munich, Germany

51. **Stirred tanks in cascades and plug-flow tubular bioreactors for continuous production of viral vaccines**
Felipe Tapia, Max Planck Institute for Dynamics of Complex Technical Systems, Germany

52. **Scalable lentiviral vector production using stable producer cell lines in perfusion mode**
Aziza Manceur, National Research Council Canada, Canada

53. **Continuous chromatography beyond affinity capture of monoclonal antibodies**
Linda Mathiasson, GE Healthcare, Sweden

54. **Enabling next-generation cell line development using continuous perfusion and nanofluidic technologies**
Chetan Goudar, Amgen, USA

ICB III (2017) SCHEDULE AT A GLANCE

Sun. Sep 17	Mon. Sep 18	Tues. Sep 19	Wed. Sep 20	Thur. Sep 21
	07:30-09:00 Breakfast	**07:30 - 09:00** Breakfast	**07:30 - 09:00** Breakfast	**06:30 - 09:30** Breakfast & Departures
	09:00 - 11:05 Session 1: Continuous Culture to Capture	**09:00 - 11:05** Session 3: End-to-end Continuous Biomanufacture	**09:00 - 11:05** Session 4: Predictive Continuous QbD Case Studies	
	11:05 - 11:45 Coffee/Networking Break	**11:05 - 11:45** Coffee/Networking Break	**11:05 - 11:45** Coffee/Networking Break	
	11:45 - 12:30 Keynote 2	**11:45 - 12:30** Keynote 3	**11:45 - 13:15** Workshops (2 in parallel)	
	12:20 - 13:45 Lunch	**12:30 - 13:30** Lunch	**13:15 - 14:30** Lunch	
14:00 - 16:15 Conference Check-in	**13:45 - 15:50** Session 2: Continuous Purification and Drug Product Sequences	**13:30 - 15:00** Poster Session with dessert	**14:30 - 16:10** Session 5: Business Case for Facilities of the Future	
16:15 - 16:30 Welcome - Conference Chairs & ECI Liaison	**15:50 - 16:45** Coffee/Networking Break	**15:00 - 22:00** Excursion and Dinner on your own before returning to hotel	**16:10 - 16:30** Coffee/Networking Break	
16:30 - 17:15 Keynote 1	**16:45 - 18:00** Poster Snapshot Session		**16:30 - 18:10** Session 6: Continuous Biomanufacture Beyond CHO or Proteins	
17:15 - 17:45 Break				
17:45 - 19:15 Workshops (2 in parallel)	**18:00 - 19:00** Free Time		**18:10 - 18:25** Stretch Break	
			18:25 - 19:00 Keynote 4 (ICB Award Lecture)	
19:30 - 21:30 Dinner	**19:00 - 20:30** Dinner		**19:00 - 19:45** Free Time	
			19:45 - 20:30 Reception	
21:30 - 23:00 Social Hour	**20:30 - 22:30** Poster Session with dessert and Social Hour		**20:30 - 22:30** Conference Banquet & Awards	
			22:30 - 23:30 Social Hour	