Program

Integrated Continuous Biomanufacturing V

“Back to Barcelona: Progress & Potential of ICB”

October 9-13, 2022
Dolce Sitges Barcelona Resort
Sitges, Spain

Conference Chairs
Ana Azevedo, Técnico Lisboa, Portugal
Jason Walther, Sanofi, USA
Rohini Deshpande, Amgen, USA
Dolce Sitges Barcelona

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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 III
September 17-21, 2017
Cascais, Portugal

Conference Chairs:
Suzanne Farid, University College London, UK
Chetan Goudar, Amgen, USA
Paula Alves, IBET, Portugal
Veena Warikoo, Axcella Health, Inc., USA

Integrated Continuous Biomanufacturing IV
October 6 – 10, 2019
Brewster (Cape Cod), Massachusetts

Conference Chairs:
Veena Warikoo, Roche, USA
Alois Jungbauer, BOKU, Austria
Jon Coffman, AstraZeneca, USA
Jason Walther, Sanofi, USA
Veena Warikoo

Highlights of Contributions to Integrated Continuous Biomanufacturing (ICB)

Veena Warikoo is an innovator and organizational leader with more than 25 years of experience across a range of disciplines in biotechnology. Throughout her career, Veena has demonstrated her depth of capability in developing high-performing teams through strategic vision setting, consistently leading teams in the delivery of industry-pioneering, state-of-the-art process technologies and facility designs within multiple multinational biopharma companies. Veena’s pragmatic and inspiring implementation-focused leadership was the primary driving force behind the earliest and most foundational successes in the field of ICB. Beyond the original achievements at Genzyme / Sanofi, Veena has broadened her impact through various leadership roles, most recently at Roche/Genentech, and across the ICB academic, supplier, and conference community. Last, but certainly not least, Veena recognized the critical interplay between people development and technology development and, in doing so, has inspired a generation of scientists across the field to carry forward her relentless focus on delivering ICB and other new technologies.

During her career, Veena has both broad and deep contributions to scientific literature via her excellent publication record. Her work has addressed a range of scientific subject matters including periodic counter-current chromatography, including critical partnership development with Cytiva (formerly GE); methods for resin sterilization and closed processing; fully continuous integrated continuous biomanufacturing; business cases justifying ICB; and general principles of manufacturability. In addition to the literature contributions, Veena is co-inventor on foundational, granted ICB patents as well as over ten ICB patent applications.

Industrially, Veena has held roles of increasing scope and responsibility. In these roles, Veena has led teams responsible for developing and delivering medicines to patients across all aspects of clinical development and commercialization, including work directly supporting the realization of several New Molecular Entities (NMEs) at multiple companies. Veena and her
teams have delivered ICB technology through to commercialization at Sanofi into a facility recognized as the Facility of the Future at the 2020 ISPE Awards. Veena’s continuously increasing scope has culminated, thus far, with global leadership responsibilities for Engineering and Technology at Roche/Genentech, focusing on modernization of Roche Pharma’s manufacturing network, leading generation of playbook for single use technology modular design and standards, and innovation leadership in the areas simplification of technology implementation governance.

Veena’s best gift to the ICB field has been her recognition that success for ICB requires a different approach to people development, hiring, and team capability building. Veena recognized that successful development of ICB technology was not primarily a process development exercise. Instead, Veena’s vision of ICB includes teams capable of integrating engineering, process control, and automation skills. In this way, Veena builds teams of “ICB Scientists” capable of understanding aspects of bioprocess, and unafraid of the challenges specific to integrating unit ops not typically within the purview of process development scientists. Above all, Veena has always put her team first, doing the hard work in the background to remove barriers, scrape together CAPEX, and almost always shying away from the spotlight of keynote presentations and associated accolades.

For the reasons described above, and for her future contributions to the ICB field undoubtedly still to come, Veena is a worthy recipient of the ICB Award, recognition granted by the ICB Award Committee on behalf of the broader ICB community.

Previous Award Winners: Massimo Morbidelli, 2019
Konstantin Konstantinov, 2017
Welcome from the Chairs

It is our great pleasure to welcome you all Back to Barcelona (Dolce Sitges), Spain for Integrated Continuous Biomanufacturing V. This conference is organized under the auspices of the Engineering Conferences International (ECI). 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 has held more than 2000 conferences covering a multitude of leading-edge topics that are uniquely cross-disciplinary and have served the engineering/scientific community for the past 57 years.

ECI’s Integrated and Continuous Biomanufacturing Conference (ICB) series is the world's premiere conference in the area of continuous biomanufacturing. In the recent past, impressive technological advances have been made to enable implementation of continuous bioprocessing across the biopharmaceutical industry. Accordingly, the focus of this conference is to build on this momentum and showcase the case studies for breakthrough ICB technologies, ICB for emerging modalities, ICB industrialization, strategies to address industry challenges and opportunities, integrated control strategies for ICB, and application of smart manufacturing tools for ICB. The program was developed to engage thoughtful discussion and will feature oral, poster and workshop sessions, with presenters and session chairs from academia and industry with a wide range of experience and from many countries around the world.

We would like to thank the industrial sponsors for their generous support. We also would like to thank all the board members, session chairs, and dedicated ECI staff for putting together a great program. Finally, we would like to thank all the speakers, poster authors, and attendees for providing the superb scientific content and look forward to the interactions that make this meeting so invaluable and productive. We hope you will enjoy the conference and participate to the fullest extent.

Conference Chairs:
Jason Walther, Sanofi, Ana Azevedo, Técnico Lisboa and Rohini Deshpande, Amgen, Inc.
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Schedule

Integrated Continuous Biomanufacturing V
“Back to Barcelona: Progress & Potential of ICB”

October 9-13, 2022

Sitges, Spain

Engineering Conference International
Locations and Notes

- Technical sessions will be in Sitges I and II.
- Poster sessions will be in Mediterrani.
- Breakfasts will be in the Verema Restaurant. Lunches on Monday and Wednesday and dinners on Sunday and Monday will also be in the Verema Restaurant.
- The gala dinner on Wednesday will be in Mediterrani.
- Please wear your mask except when giving a presentation or actively eating or drinking. Please maintain physical distancing as much as possible.
- 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 the author and ECI have granted prior permission.
- 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.
- Questions will be submitted via the Guidebook app that we will be using for the conference. The app will be used in place of the roving microphones we normally have.
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<th>Time</th>
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<tr>
<td>14:00 – 16:30</td>
<td>Conference Check-in</td>
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<tr>
<td>16:30 – 16:45</td>
<td>Welcome</td>
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| 16:45 – 17:30 | **Keynote 1**  
The Role of Digitalization in the Continuous Integrated Manufacturing of Therapeutic Proteins  
Massimo Morbidelli, Politecnico di Milano, Italy |
| 17:30 – 18:15 | **Panel Session on Digitalization**                                   
Facilitated by Richard Braatz, Massachusetts Institute of Technology, USA  
Panelists: Jennifer Pollard, Merck Sharpe & Dohme, USA  
Massimo Morbidelli, Politecnico di Milano, Italy  
Cenk Undey, Roche, USA  
Kevin Brower, Sanofi, USA  
Anurag Rathore, Indian Institute of Technology Delhi, India |
| 18:15 – 19:00 | Free Time                                                            |
| 19:00 – 20:00 | Reception (Pool Area)                                                |
| 20:00 – 21:30 | Dinner                                                               |
| 21:30 – 23:00 | Networking                                                           |
Monday, October 10, 2022

07:00 – 08:30  Breakfast

Session 1: Breakthrough ICB technologies on the horizon
(Sponsored by YMC Process Technologies, Inc.)
Chairs: Astrid Dürauer, BOKU, Austria
       Michael Coolbaugh, Sanofi, USA

08:30 – 08:55  A truly continuous counter-current downstream
Jon Coffman, AstraZeneca, USA

08:55 – 09:20  Democratizing global supply of recombinant proteins
Kerry Love, Sunflower Therapeutics, USA

09:20 – 09:45  A fully continuous and modular monoclonal antibody purification process with capture via precipitation
Todd Przybycien, Rensselaer Polytechnic Institute, USA

09:45 – 10:10  Exploring different medium exchange regimes in ultra scale-down models
Marie Dorn, University College London, United Kingdom

Juergen Mairhofer, enGenes Biotech GmbH, Austria

10:35 – 11:15  Coffee / Networking Break (Sponsored by Sanofi)

Poster Snapshot Session
Chairs: Todd Przybycien, Rensselaer Polytechnic Institute, USA
       Mattia Sponchioni, Politecnico Di Milano, Italy
       Marcella Yu, Sutro Bio, USA

11:15 – 11:21  Overcoming key challenges during the upstream development of a continuous manufacturing process at 500L scale
Leon Pybus, FUJIFILM Diosynth Biotechnologies, United Kingdom

11:21 – 11:27  Understanding factors that cause product retention and fouling of hollow fiber filters in intensified perfusion processes
Sri Madabhushi, Merck Sharpe & Dohme, USA

11:27 – 11:33  Automated control of osmolality in a perfusion bioreactor system via in situ conductivity sensors
Amanda Ramsdell, Sanofi, USA

11:33 – 11:39  Transcriptomics and modelling to understand the benefits of low perfusion rate
Meeri Mäkinen, Cell Technology Group, Industrial Biotechnology KTH, Sweden

11:39 – 11:45  Dynamic process control of continuous twin-column chromatography
Giulio Lievore, ChromaCon AG, Switzerland

11:45 – 11:51  Residence time distribution of continuous protein a chromatography
Narges Lali, acib- Austrian Centre of Industrial Biotechnology, Austria

11:51 – 11:57  WITHDRAWN
Monday, October 10, 2022 (continued)

11:57 – 12:03 WITHDRAWN

12:03 – 12:09 Advanced control strategies for the continuous production of monoclonal antibodies
Markus Kampmann, Sartorius, Corporate Research, Germany

12:09 – 12:15 Pilot scale technical establishment and commercial scale business case on integrated continuous biomanufacturing
Takuo Kawase, Chugai Pharmaceutical Co., Ltd., Japan

12:15 – 12:21 Successful transition from fed-batch to continuous manufacturing within a mAb process development cycle
Karthik P. Jayapal, Merck Sharpe & Dohme, USA

12:21 – 12:27 Establishing a highly automated and digitalized end-to-end bioprocess
Martin Purtscher, Baxalta Innovations GmbH, Austria

12:27 – 12:33 Design & construction of a truly continuous and fully automated process skid for the production and purification of a monoclonal antibody
Magdalena Pappenreiter, Bilfinger Life Science GmbH, Austria

12:33 – 12:39 Enhanced process control of an integrated and scalable bioprocess for production and isolation of MSC-derived extracellular vesicles for cardiac repair
Marta Costa, iBET, Portugal

12:39 – 12:45 Plug-and-play software for mechanistic modelling of end-to-end continuous manufacturing of monoclonal antibodies
Moo Sun Hong, Massachusetts Institute of Technology, USA

12:45 – 14:00 Lunch

Session 2: Continuous manufacturing of emerging therapeutic modalities
(Sponsored by Roche)
Chairs: Joseph Shultz, Evelo Biosciences, USA
Cristina Peixoto, iBET, Portugal

14:00 – 14:25 The multidimensional evolution of ICB: New concepts, technology, and therapeutic modalities
Konstantin Konstantinov, Codiak BioSciences, USA

14:25 – 14:50 Mechanistic modeling to predict titers and infected cells in the two-stage continuous production of a viral vaccine
Krystian Ganko, Massachusetts Institute of Technology, USA

14:50 – 15:15 Towards an integrated continuous manufacturing process of adeno-associated virus (AAVs)
João Mendes, iBET, Portugal

15:15 – 15:40 Continuous manufacturing of lentiviral vectors
Dale Stibbs, University College London, United Kingdom

15:40 – 16:05 Progress towards making a global supply of microbial extracellular vesicles, 100-times cheaper than a typical biologic
Collin McKenna, Evelo Biosciences, Inc., USA
Monday, October 10, 2022 (continued)

16:05 – 16:30  Looking beyond the horizon: Exosomes at the vanguard of integrated continuous processing of bionanoparticles
Aaron Noyes, Codiak BioSciences, USA

16:30 – 17:15  Coffee / Networking Break (Sponsored by Regeneron)

17:15 – 18:00  Keynote 2
A race to contain a global pandemic: The development of the Pfizer/BioNTech mRNA vaccine
Ranga Godavarti, Pfizer, USA

18:00 – 20:00  Poster Session 1
(Authors of odd-numbered posters are asked to stay with their presentations)
Chairs: Todd Przybycien, Rensselaer Polytechnic Institute, USA
Mattia Sponchioni, Politecnico Di Milano, Italy
Marcella Yu, Sutro Bio, USA

20:00 – 21:30  Dinner

21:30 – 23:00  Social Hour
Tuesday, October 11, 2022

07:00 – 08:30  Breakfast

**Session 3: The case for ICB industrialization**  
*Sponsored by Sanofi*  
Chairs: Jennifer Pollard, Merck Sharpe & Dohme, USA  
Andrea Rayat, University College London, United Kingdom

08:30 – 08:55  
GMP implementation of continuous manufacturing: A case study  
Neil Soice, Amgen, Inc., USA

08:55 – 09:20  
Business case for continuous mAb production with novel design strategies and enhanced control  
Catarina Neves, University College London, United Kingdom

09:20 – 09:45  
Key enablers of continuous manufacturing success through a flexible J.POD® platform  
Eva Gefroh, Just Evotec Biologics, USA

09:45 – 10:10  
Demonstration of a commercial scale end-to-end continuous purification process  
Chad Varner, Sanofi, USA

10:10 – 10:35  
From lab coats to hard hats: Implementation of GMP continuous manufacturing on the road to commercial readiness  
Mark Brower, Merck Sharpe & Dohme, USA

10:35 – 11:15  Coffee / Networking Break  
*Biopharm Services Ltd*

11:15 – 12:45  
**Workshop 1: Standardization and modularization: A rising tide lifts all ICB processes**  
*Sponsored by Pfizer*  
Chairs: Paul Randolph, Janssen, USA  
Michael Phillips, Merck Life Sciences, USA

**Workshop 2: Promoting academic, industrial, government, and non-profit collaborations for next-generation biomanufacturing**  
Chairs: Kerry Love, Sunflower Therapeutics, USA  
John Erickson, NIIMBL, USA  
Veronique Chotteau, KTH, Sweden

**Workshop 3: Continuous biomanufacturing: Opportunities and challenges for a sustainable future**  
Chairs: Sara Badr, The University of Tokyo, Japan  
Priyanka Gupta, Sartorius Stedim, USA

12:45 – 14:45  
**Poster Session 2 and Lunch**  
*Authors of even-numbered posters are asked to stay with their presentations*  
Chairs: Todd Przybycien, Rensselaer Polytechnic Institute, USA  
Mattia Sponchioni, Politecnico Di Milano, Italy  
Marcella Yu, Sutro Bio, USA

14:45 – 15:30  
**Keynote 3**  
FDA’s progress in advanced manufacturing  
Larry Lee, FDA, USA

15:30 –  Excursion (Winery tour and tasting) followed by dinner on your own in Sitges
Wednesday, October 12, 2022

07:00 – 08:30  Breakfast

Session 4: ICB strategies to address industry challenges and opportunities
(Sponsored by Cytiva)
Chairs: Lisa Connell-Crowley, Just-Evotec Biologics, USA
       Anurag S. Rathore, Indian Institute of Technology Delhi, India

08:30 – 08:55  Process intensification: Modeling the impact of technology and process scenario selection on cost, throughput, facility volume, footprint and sustainability
Priyanka Gupta, Sartorius Stedim Biotech, USA

08:55 – 09:20  Development of a flexible and modular approach for integrated continuous biomanufacturing
Michael Coolbaugh, Sanofi, USA

09:20 – 09:45  Highly automated bioburden-free continuous manufacturing biologics GMP operations: How to get there?
Lara Fernandez Cerezo, Merck Sharpe & Dohme, USA

09:45 – 10:10  Continuous downstream process of monoclonal antibody developed based on the process analysis/understanding and its validation
Shuichi Yamamoto, Yamaguchi University, Japan

10:10 – 10:35  Intensified bioprocessing: Data, data, everywhere...
Marc Bisschops, Pall Biotech, Netherlands

10:35 – 11:15  Coffee / Networking Break

11:15 – 12:45  Workshop 4: GMP implications for fully E2E processes: Are we fulfilling our expectations?
Chairs: Mark Brower, Merck Sharpe & Dohme, USA
       Neil Soice, Amgen, Inc., USA

Workshop 5: Solving the problems of ICB process development to unlock the full potential of continuous manufacturing
(Sponsored by Sartorius)
Chairs: Steven Cramer, Rensselaer Polytechnic Institute, USA
       David Garcia, Novartis Pharma, Switzerland

Workshop 6: Risk assessment for the adoption of ICB: What factors still stand in our way?
Chairs: Chris Hwang, Transcenta Therapeutics, USA
       Julie Kozaili, Asahi Kasei Bioprocess, USA

12:45 – 14:00  Lunch

Session 5: Integrated control strategies to advance ICB
(Sponsored by Merck)
Chairs: Bernt Nilsson, Lund University, Sweden
       Irina Ramos, AstraZeneca, USA

14:00 – 14:25  Pilot-scale integrated continuous biomanufacturing for monoclonal antibodies including mild pH
Veronique Chotteau, KTH, Sweden
Wednesday, October 12, 2022 (continued)

14:25 – 14:50  Design considerations when scaling from 3-L to 3000-L or larger
Kenneth Lee, AstraZeneca, USA

14:50 – 15:15  Real-time process analytical technology: Fluorescent dye-based
miniaturized sensor for aggregate detection
Mariana Neves Sao Pedro, Delft University of Technology, Netherlands

15:15 – 15:40  Enabling PAT in insect cell bioprocesses: A monitoring toolbox for rAAV
production
Inês A. Isidro, iBET, Portugal

15:40 – 16:20  Coffee / Networking Break

Session 6: Application of smart manufacturing tools to ICB
(Sponsored by Amgen)
Chairs: Cenk Ündey, Roche, USA
Christoph Herwig, TU Wien, Austria

16:20 – 16:45  Development of the PAT toolkit for continuous bioprocessing
Tiziano Brogna, Merck Healthcare, Switzerland

16:45 – 17:10  Advanced process control and process analytical technology for
continuous bioprocessing
Lukas Kuerten, Centre for Process Innovation Ltd., United Kingdom

17:10 – 17:35  Model based control of continuous bioprocesses
Anurag Rathore, Indian Institute of Technology, Delhi, India

17:35 – 18:00  Advanced process control strategies for continuous influenza viral particle
production
Pavan Inguva, Massachusetts Institute of Technology, USA

18:00 – 18:45  Award Keynote
Veena Warikoo, AstraZeneca, USA

18:45 – 19:30  Free Time

19:30 – 20:30  Reception

20:30 – 22:30  Banquet and Awards Ceremony

22:30 – 23:30  Social Hour

Thursday, October 13, 2022

07:00 – 09:00  Breakfast and Departure
Poster Presentations

1. Automated control of osmolality in a perfusion bioreactor system via in situ conductivity sensors
   Amanda Ramsdell, Sanofi, USA

2. Dissolved oxygen control in intensified perfusion bioreactors at benchtop and pilot scale
   Ethan Penner, Sanofi, USA

3. Fully automated on demand cell culture media preparation for perfusion bioreactors
   Lisa Wolowczyk, Merck KGaA, Germany

4. Automated sampling in upstream process development for accelerated access to Critical Process Parameters (CPPs) and Critical Quality Attributes (CQAs)
   Srijana Chapagain, MilliporeSigma, USA

5. Transcriptomics and modelling to understand the benefits of low perfusion rate
   Meeri Mäkinen, Cell Technology group, Industrial Biotechnology KTH; AdBIOPRO, Centre for Advanced BioProduction by Continuous Processing, Sweden

6. Amino acids and antibody N-glycosylation based on Raman spectroscopy in high cell density perfusion culture
   Veronique Chotteau, KTH; AdBIOPRO, Competence Centre for Advanced BioProduction by Continuous Processing, Sweden

7. Preliminary metabolic screening method for clone selection in the ambr15
   Christine Ferng, AstraZeneca, USA

8. Understanding factors that cause product retention and fouling of hollow fiber filters in intensified perfusion processes
   Sri Madabhushi, Merck & Co., Inc., USA

9. Challenges of mass transfer for perfusion cultures in single use bioreactors part 1: Oxygen
   Anthony Beaney, Lonza Biologics, United Kingdom

10. Biomanufacturing and testbed development for the continuous production of monoclonal antibodies
    Richard Braatz, Massachusetts Institute of Technology, USA

11. WITHDRAWN

12. Advanced control strategies for the continuous production of monoclonal antibodies
    Markus Kampmann, Sartorius, Corporate Research, Germany

13. N-mAb: A case study supporting adoption of integrated continuous bioprocesses
    Kevin Brower, Sanofi, USA

14. Accelerating adenovirus manufacturing by perfusion-based process optimization
    Piergiuseppe Nestola, Sartorius Stedim Biotech, Switzerland

15. Enabling AAV production by transient transfection with high cell density perfusion process
    Ye Zhang, KTH, AdBIOPRO, Sweden
16. **Process intensification combined with Adaptive Laboratory Evolution enhance VLP-based vaccine candidates production in insect cells**  
Ricardo Correia, iBET, ITQB-NOVA, Portugal

17. **Enhanced process control of an integrated and scalable bioprocess for production and isolation of MSC-derived extracellular vesicles for cardiac repair**  
Marta Costa, iBET, Portugal

18. **Integrated & continuous processing: A proven solution to tackle gene therapy manufacturing challenges**  
Rimenys Carvalho, Univercells Technologies S.A., Belgium

19. **Pichia pastoris, a promising microbial cell factory for continuous manufacturing**  
Xavier Garcia-Ortega, Universitat Autònoma de Barcelona, Spain

20. **Do more with less: Fit-for-purpose tools to speed up upstream process development for continuous biomanufacturing**  
Channing McLaurin, MilliporeSigma, USA

21. **Next generation perfusion process development for production of biologics**  
Jianlin Xu, Bristol Myers Squibb, USA

22. **Optimization of a dynamic perfusion process using a combination of high throughput experimentation and hybrid modeling approaches**  
Maarten Pennings, BiosanaPharma, Netherlands

23. **Two small-scale perfusion models for the ambr250 to enable the study of production stability**  
Sarah Harcum, Clemson University, USA

24. **WITHDRAWN**

25. **A scale-down model to investigate cell retention for continuous monoclonal antibody manufacture**  
Delphine Tavernier, University College London, United Kingdom

26. **Implementation of intensified and continuous processing to increase yield of lentivirus manufacturing**  
Keen Chung, Repligen Corporation, USA

27. **Real-time model-based control of single pass tangential flow filtration for production of monoclonal antibodies**  
Venkataramana Runkana, Tata Consultancy Services, India

28. **Dynamic process control of continuous twin-column chromatography**  
Giulio Lievore, ChromaCon AG, Switzerland

29. **Miniaturization of chromatographic process development: Achieving fast results with minimal costs**  
Tiago Castanheira Silva, Technische Universiteit Delft, Netherlands

30. **Residence time distribution of continuous protein a chromatography**  
Narges Lali, acib- Austrian Centre of Industrial Biotechnology; University of Natural Resources and Life Sciences, Vienna, Austria, Austria
31. Continuous purification of antifungal peptide with a continuous chromatographic system based on fluidized bed technology
   Lisa-Marie Herlevi, Jacobs University Bremen, Germany

32. Design and optimization of membrane chromatography process for monoclonal antibody charge variant separation
   Sathish Nadar, The University of Queensland, The Australian Institute of Bioengineering and Nanotechnology, Australia

33. Continuous counter-current affinity colloidal purification
   Jon Coffman, AstraZeneca, USA

34. Towards implementation of novel single-use devices in integrated processes for biopharmaceuticals
   Marina Y. Linova, Technical University of Denmark, Denmark

35. Monoclonal antibody purification from gram to kilogram scale utilizing multi-column continuous rProtein A capture
   J. Kevin O'Donnell, Tosoh Bioscience LLC, USA

36. Design of a twin-column countercurrent purification (MCSGP) unit for the polishing of an oligonucleotide sequence
   Ismaele Fioretti, Politecnico di Milano, Italy

37. Moving adsorption belt system for continuous bioproduct recovery
   Yijia Guo, Jacobs University Bremen, Germany

38. Continuous vaccine purification utilizing multi-stage aqueous two-phase extraction
   Caryn Heldt, Michigan Technological University, USA

39. Feedback control of particle morphology enables continuous monoclonal antibody capture via precipitation
   Matthew Mergy, Rensselaer Polytechnic Institute, USA

40. Oscillatory flow reactor: A solution for continuous bioprocessing
   Diogo Ferreira-Faria, IBB – Institute for Bioengineering and Biosciences, Instituto Superior Técnico, University of Lisbon, Portugal

41. Solid polyethylene glycol precipitation: Potential cost reduction in antibody downstream processing
   Maria del Carme Pons Royo, Acib, BOKU, Austria

42. Truly continuous downstream processing of antibodies, overcoming bottlenecks
   Gabriele Recanati, University of Natural Resources and Life Sciences, Vienna, Austria

43. Continuous Counter-current Dialysis (C3D) - the Future of Diafiltration
   Irina Ramos, AstraZeneca, USA

44. A perspective on polishing operations for the continuous removal of process and product related impurities
   Steven Cramer, Rensselaer Polytechnic Institute, USA

45. Constant flow rate viral clearance study of Planova™ BioEX virus removal filter and implementation into an integrated process for mAb purification
   Hironobu Shirataki, Asahi Kasei Medical, Japan
46. Integration of low-pH viral inactivation and primary clarification processes in a single use disposable biosettler
Dhinakar Kompala, Sudhin Biopharma Co, USA

47. Continuous virus filtration: An existing technology with a promising future
Julie Kozaili, Asahi Kasei Bioprocess, USA

48. Implementation of PAT-based control strategy for continuous formulation
Sushmitha Krishnan, Sanofi, USA

49. Plug-and-play software for mechanistic modelling of end-to-end continuous manufacturing of monoclonal antibodies
Moo Sun Hong, Massachusetts Institute of Technology, USA

50. Model assisted design of an intensified bioprocess
Ruth de la Fuente, Pall Corporation, Germany

51. Establishing a highly automated and digitalized end-to-end bioprocess
Martin Purtscher, Baxalta Innovations GmbH, Austria

52. Development and industrialization of advanced biomanufacturing platform to address business needs and affordability of biologics
Christopher Hwang, Transcenda Therapeutics Inc., China

53. Successful transition from fed-batch to continuous manufacturing within a mAb process development cycle
Karthik P. Jayapal, Merck & Co, USA

54. Conversion of an intensified fed-batch to an integrated continuous bioprocess
Brian Follstad, Just – Evotec Biologics, Inc., USA

55. A case study: Scale up from bench to 500L of a biologics continuous manufacturing process
Sarwat Khattak, Biogen, USA

56. Overcoming key challenges during the upstream development of a continous manufacturing process at 500L scale
Leon Pybus, FUJIFILM Diosynth Biotechnologies, United Kingdom

57. Design of an integrated continuous downstream process for emerging acid-sensitive antibodies based on a calcium-dependent protein A ligand
Joaquin Gomis Fons, Lund University, Lund, Sweden, Sweden

58. Design & Construction of a truly continuous and fully automated process skid for the production and purification of a monoclonal antibody
Magdalena Pappenreiter, Bilfinger Life Science GmbH, University of Natural Resources and Life Sciences Vienna, Austria

59. Accelerate process development and transfer for the implementation of integrated continuous biomanufacturing
David Garcia, Novartis Pharma, Switzerland

60. Simulated control strategy for product diversion management during continuous processing
Thomas Ransohoff, National Resilience, Inc, USA
61. **Bringing flexibility to integrated continuous biomanufacturing**  
Paul Randolph, Janssen R&D LLC, USA

62. **Pilot scale technical establishment and commercial scale business case on integrated continuous biomanufacturing**  
Takuo Kawase, Chugai Pharmaceutical Co., Ltd., Japan

63. **Intensified & connected processing for fast, cost effective, and robust monoclonal antibody manufacturing**  
Sanket Jadhav, Sartorius Stedim Biotech, Netherlands

64. **Cost and life cycle assessment of upstream monoclonal antibody production**  
Sara Badr, The University of Tokyo, Japan

65. **Process intensification - So much more than continuous bioprocessing**  
Niklas Jungnelius, Cytiva, Sweden

66. **Assessing the sustainability of fed batch and continuous process formats for mAb manufacturing via bioprocess modeling**  
Caroline Mueller, Just-Evotec Biologics, Inc., USA
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Calendar of ECI Conferences

Celebrating 60 years of international, interdisciplinary engineering conferences

2022

Oct 2-7
21AN  NANOMECHANICAL TESTING IN MATERIALS RESEARCH AND DEVELOPMENT VIII (Split, Croatia)
S. Korte-Kerzel, RWTH Aachen University

Oct 9-13
22AA  INTEGRATED CONTINUOUS BIOMANUFACTURING V (Sitges, Spain)
J. Walther, Sanofi; A. Azevedo, Instituto Superior Técnico; R. Deshpande, Amgen

Oct 30-Nov 3
20AE  ELECTROPHORETIC DEPOSITION VII: FUNDAMENTALS AND APPLICATIONS (Santa Fe, New Mexico)
A.R. Boccaccini, Univ. of Erlangen-Nuremberg; B. Ferrari, Spanish Research Council; A.J. Pascall, Brookhaven National Laboratory; T. Uchikoshi, National Institute for Materials Science

Nov 13-18
21AS  CERAMIC MATRIX COMPOSITES II (Santa Fe, New Mexico)
Y. Kagawa, Tokyo University of Technology; R. Darolia, GE Aviation (retired); R. Raj, University of Colorado; G. Singh, Kansas State University; D. Koch, University of Augsburg; G. Vignoles, University of Bordeaux; J. Binner, University of Birmingham

Dec 10-14
21AB  POLYMER REACTION ENGINEERING XI (Scottsdale, AZ)
T. Mckenna, Universite Claude Bernard, France; C. Sayer, Federal University of Santa Catania, Brazil; J. Reimers, ExxonMobil, USA

Dec 18-21
20AY  ADVANCES IN COSMETIC FORMULATION DESIGN II (Durham, NC)
S. Amin, Manhattan College; P. Somasundaran, Columbia University

2023

March 19-24
22AD  ELECTRIC FIELD ENHANCED PROCESSING OF ADVANCED MATERIALS III: COMPLEXITIES AND OPPORTUNITIES (Tomar, Portugal)
R. Raj, University of Colorado at Boulder; Luis Perez-Maqueda, CICA, Spain

April 23-29
23AC  CELL CULTURE ENGINEERING XVIII (Cancun, Mexico)
L. Palomares, IBT-UNAM; C. Goudar, Amgen; T. Wang, Roche

May 7-12
23AP  PYROLIQ II – 2023: Pyrolysis and Liquefaction of Biomass and Wastes (Hernstein, Austria)
F. Berruti, ICFAR & Western University; A. Dufour, CNRS, ENSIC; M. Garcia-Perez, Washington State University; W. Prins, University of Ghent

May 28-June 2
21AG  ALKALI ACTIVATED MATERIALS AND GEOPOLYMERs: SUSTAINABLE CONSTRUCTION MATERIALS AND CERAMICS MADE UNDER AMBIENT CONDITIONS (Cetraro (Calabria), Italy)
W.M. Kriven, University of Illinois at Urbana-Champaign; C. Leonelli, Universita` degli Studi di Modena e Reggio Emilia; J.L. Provis, University of Sheffield; A.R. Boccaccini, University of Erlangen-Nuremberg

June 11-15
21AO  ADVANCES IN OPTICS FOR BIOTECHNOLOGY, MEDICINE AND SURGERY (Tomar, Portugal)
M. Niedre, Northeastern University; F. Leblond, Polytechnique Montreal

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SIXTH INTERNATIONAL WORKSHOP ON STRESS-ASSISTED CORROSION DAMAGE (Washington, DC area)
A.K. Vasudevan, Office of Naval Research (retired); R. Latanision, Exponent, Inc.; H. Holroyd, Luxfer (retired); F. Friedersdorf, Luna Innovations Inc.

ASSOCIATION IN SOLUTION V (Azores, Portugal)
I. Voets, Eindhoven University of Technology; J. Strakel, Wageningen University; J. Conrad, University of Houston

SYNTACTIC AND COMPOSITE FOAMS VI (TBA-Europe)
G.M. Gladysz and K.K. Chawla, University of Alabama at Birmingham; A. R. Boccaccini, University of Erlangen- Nuremberg; M. Fukushima, National Institute of Advanced Industrial Science and Technology

SINGLE USE TECHNOLOGIES VI (Boston, USA)
M. Barbaroux, Sartorius; S. Kane, Takeda; S. Yoon, University of Massachusetts, Lowell

INTERNATIONAL HYDROGEN CONFERENCE: UNDERSTANDING HYDROGEN-MATERIALS INTERACTIONS (Park City, Utah)
M. Martin, NIST; J. Burns, University of Virginia

BIO-CHAR III (Tomar, Portugal)
F. Berruti, Western University, Canada; D. Chiaramonti, Politecnico di Torino and RE-CORD, Italy; S. Fiore, Politecnico di Torino, Italy; M. Garcia-Perez, Washington State University, USA; O. Masek, University of Edinburgh, UK

ENZYME ENGINEERING XXVII (Singapore)
Ang Ee Lui, A*Research, Singapore; Li Zhi, National University of Singapore; Yan Feng, Shanghai Jiao Tong University

NONSTOICHIOMETRIC COMPOUNDS VIII (Tainan, Taiwan)
W. Chueh, Stanford University; F-Z Fung, National Cheng Kung University; R. Waser, RWTH Aachen; H. Takamura, Tohoku University

TRANSITION OF ENERGY SYSTEMS TOWARDS SUSTAINABILITY (India TBA)
S. De, S. Bandyopadhyay, IIT, Bombay

ADVANCING MANUFACTURE OF CELL AND GENE THERAPIES VIII (Coronado, CA)
F. Masri, Cell & Gene Catapult; C. Yeager, Georgia Institute of Technology; G. Maheshwari, BMS; J. Moscariello, BMS

ADVANCED MEMBRANE TECHNOLOGY VIII: ENVIRONMENT, FOOD, HEALTH AND NEW FRONTIERS (Casablanca, Morocco)
J. Hestekin, University of Arkansas; U. Beusche, W.L. Gore, Inc.; D. Bhattacharyya, University of Kentucky

DELIVERY OF NUCLEIC ACID THERAPEUTICS II: BIOLOGY, ENGINEERING AND DEVELOPMENT (Siracusa, Sicily)
L. Sepp-Lorenzino, Intellia Therapeutics; S. F. Dowdy, University of California San Diego School of Medicine; M. Stanton, Generational Bio

ULTRA-HIGH TEMPERATURE CERAMICS: MATERIALS FOR EXTREME ENVIRONMENT APPLICATIONS V (Italy)
D. Sciti, Institute for Science and Technology of Ceramics, CNR;

MICROBIAL ENGINEERING III (TBA)
E. Keshavarz-Moore, University College London; T. Sauer, Sanofi

VACCINE TECHNOLOGY IX (Los Cabos, Mexico)
C. Lutsch, Sanofi Pasteur; L. Lua, University of Queensland; F. Godia, Universitat Autònoma de Barcelona; T. Tagmyer, Merck

A not-for-profit organization serving the engineering community since 1962 with international, interdisciplinary engineering conferences
Engineering Conferences International

Engineering Conferences International (ECI) is a not-for-profit global engineering conferences program that has served the engineering/scientific community since 1962 as successor program to Engineering Foundation Conferences. ECI has received recognition as a 501(c)3 organization by the U.S. Internal Revenue Service and is incorporated in the State of New York as a not-for-profit corporation.

The program has been developed and is overseen by volunteers both on the international Board of Directors and international Conferences Committee. More than 1,900 conferences have taken place to date. The conferences program is administered by a professional staff and the conferences are designed to be self-supporting.

ECI Mission

To serve the engineering/scientific community with international, interdisciplinary, leading edge engineering research conferences

ECI Purposes

The advancement of engineering arts and sciences by providing a forum for the discussion of advances in the field of science and engineering for the good of mankind by identification and administration of international interdisciplinary conferences

To work with engineering, scientific and social science societies and the interested general public to jointly sponsor conferences and to take other actions that will foster complementary programming.

To initiate conferences that will have a significant impact on engineering education, research practice and/or development.

ECI Encouragement of New Conference Topics

The ECI Conferences Committee invites you to suggest topics and leaders for additional conferences and encourages you to submit a proposal for an ECI conference.

Ideally, proposals should be submitted from 18 to 24 months in advance of the conference although the staff can work on a shorter timeline.

The traditional format for an ECI conference is registration Sunday afternoon with technical sessions held each morning and evening through Thursday or Friday noon. Afternoons are used for informal gatherings, poster sessions, field trips, subgroup meetings and relaxation. This format has served well to build important professional networks in many areas.

ECI welcomes proposals for shorter conferences and for conferences which span weekends in order to reduce the number of working days participants are away from their offices.
ECI Works With You

ECI works with conference chairs in two complementary ways. First, an experienced member of the Conferences Committee acts as your technical liaison from the proposal stage through the conference itself. He or she is always available to consult with you on any conference issue.

Second, after your proposal has been approved by the Conferences Committee, the ECI staff will assume responsibility for the administration of the conference.

Your primary responsibilities will be recruiting the organizing committee, developing the technical program and securing third-party funding necessary to support the travel of key speakers.

The responsibilities of ECI’s “full service” staff include -- but are not limited to -- the following:

- Recommend, negotiate, contract and make substantial deposits for housing, meals, meeting space, A/V equipment and tours.
- Maintain web sites for the conference and for submission of abstracts.
- Publicize via electronic and print media.
- Administer all finances including grants, contributions and purchase orders. (ECI makes grant funds available as soon as a grant is approved.) There is no need for chairs to set up a conference bank account or file tax returns for their conference.
- Process all applications and registrations.
- Produce bound program/abstracts book.
- Contract for the publication of print or electronic proceedings, if any.
- Provide on-site staff during the conference.

For more information, please contact the ECI Director at Barbara@engconfintl.org