Program

Cell Culture Engineering XIII

April 22 – 27, 2012

Scottsdale, Arizona, USA

Conference Chairs

Matt Croughan
Keck Graduate Institute

Mark Leonard
Pfizer

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

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Welcome from the CCE XIII Chairs

It is with great pleasure that we welcome you to the 13th Cell Culture Engineering conference. Over the last two and a half decades, this series has established a reputation as one of the premiere conferences in the field and has had a significant impact on the approaches and direction of cell culture technologies and on our industry.

With ~370 participants from 24 countries on 5 continents, this year's meeting is the largest ECI conference ever and one of the most diverse to date. The program includes 39 oral presentations, 8 workshops and 206 posters. Recognizing the very large number of high quality abstract submissions relative to the number of plenary session oral presentation slots, we are trying an experiment and have added four parallel Chair Select sessions to the program this year, enabling an additional 20 speaking slots. This allowed us to include more new and up-and-coming members of the community in the oral program. As is the tradition for this conference series, we have allotted a significant amount of time for poster sessions and encourage you to take full advantage of the opportunity to explore and discuss the large body of interesting and excellent work that will be presented in these venues.

The recombinant cell culture field continues to mature, bringing new challenges and opportunities. The ability to produce a given antibody at a titer of 5-10 g/L is becoming "the norm"; However, perhaps ironically, high clinical attrition rates for candidate therapeutics is placing more emphasis on "project capacity", rather than just absolute titer. This is driving a growing emphasis on technologies and paradigms that significantly reduce the timelines and costs for clinical material supply, enabling smaller, cheaper batches for many more clinical candidates. And, of course, there is a strong desire for these rapidly-developed, low cost processes to quickly and seamlessly transition to Registration, and robustly support large commercial needs (ideally with those 5-10 g/L titers!). With this in mind, we've attempted to construct a program that encompasses many of these challenges and more, bringing together leading academic and industrial contributors sharing new approaches and technologies, and identifying new opportunities for this community moving forward. We have also included talks and posters on cell therapy and vaccines, for cross-fertilization of strategies and technologies between cell culture experts in different application areas. We strongly encourage you to engage in the dialogue, think broadly and to explore how expertise and technologies from different areas could be valuable in your work, as well as reaching out to others to share your expertise in addressing their challenges.

We invite you to enjoy the near perfect temperatures, splendid natural scenery and wonderful amenities of the beautiful Fairmont Scottsdale Princess Resort, and the many attractions in Scottsdale and beyond; These include spectacular vistas for viewing, hiking, biking and golfing, as well as shops and art galleries featuring Native American arts and crafts. We hope that the combination of this relaxing environment and the stimulating content of the conference will inspire great conversations, new ideas, and future collaborations to advance the field.

We want to thank all of the session chairs, workshop chairs, organizers and committee members that have worked hard to put together be a high quality program, and the corporate sponsors for enabling a record level of academic attendance (107).

Finally, a special thanks to Barbara Hickernell and her team at ECI, particularly Kathy Chan and Kevin Korpics, for their tireless help and enormous assistance with the logistics and details.

We hope that this conference will live up to the high standard that has been set for the CCE series by preceding Chairs.

Welcome to Scottsdale and Cell Culture Engineering XIII.

Matt Croughan & Mark Leonard

Chairs, Cell Culture Engineering XIII

2012 Cell Culture Engineering Award Winner

James M. Piret

University of British Columbia

James (Jamie) Piret is one of the preeminent research engineers working on mammalian cell culture for the production of cell-based therapies and recombinant protein therapies. Jamie's gift lies in his ability to identify and then solve important problems through innovative thinking and a penetrating fundamental understanding of cell biology and biochemical engineering analysis. He has been a leading figure in and vocal champion of the Cell Culture Engineering field for more than 20 years. His contributions are broad in scope and scale, ranging from novel single cell and molecular analyses, to massively parallel nano-liter culturing systems, to advances and innovations that are both respected and adopted by industry as part of their efforts to improve the economics and quality of biologics manufacturing.

This prestigious award is to recognize outstanding contributions to the field of Cell Culture Technology & Engineering, and significant service and dedication to the profession. The award was established in 2001, and is given bi-annually at the Cell Culture Engineering conference (ECI Conferences).

Former recipients were: Wei-Shou Hu (2002), Eleftherios T. Papoutsakis (2004), W. Robert Arathoon (2006), Martin Fussenegger (2008), and Michael Betenbaugh (2010).

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Sunday, April 22, 2012

13:00 – 17:00	Conference check-in (Satellite Desk) Poster set-up
15:00 – 16:30	**'Omics Workshop** Workshop leaders: Susan Sharfstein, SUNY Albany, USA Kelvin Lee, University of Delaware, USA Mike Betenbaugh, Johns Hopkins, USA
17:00 – 17:15	**Welcoming Remarks and Opening of Conference** Matt Croughan, Keck Graduate Institute, USA Mark Leonard, Pfizer, USA A few words about ECI on its 50th anniversary by John Aunins
17:15 – 18:15	**Opening Keynote** **From genetic engineering technology (Genentech) to epigenetics** Art Riggs, City of Hope, USA
18:15 – 20:15	Dinner (Princess Plaza)
20:15 – 22:30	**Poster Session / Social Hours** (Authors of even-numbered posters are asked to stay by their posters)

NOTES

- Technical Sessions will be held in Salons A - E.
- Poster Sessions will be held in Salons H and I.
- Breakfasts and Lunches will be in Princess Plaza.
- Dinner locations are noted in the program.
- Workshop locations and Chair Select Session locations will be announced on site.
- Audiotaping, videotaping and photography of presentations are prohibited.
- 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 at the registration desk or confirm that the listing is correct. A corrected copy will be sent to all participants after the conference.

Monday, April 23, 2012

07:00 – 08:30	Breakfast
	Session I: Impact of Process on Product Quality Chairs: Charles Goochee, Johnson and Johnson, USA Sarah Harcum, Clemson University, USA
08:30 – 08:55	**Controlling high mannose glycan level and optimizing titer through a balanced modulation of cell culture process and medium changes** Henry Lin, Amgen, Inc., USA
08:55 – 09:20	**Understanding increased C-terminal lysine in a recombinant monoclonal antibody production using Chinese hamster ovary cells with chemically defined media** Jun Luo, Genentech, Inc., USA
09:20 – 09:45	**Modulating product quality through cell line and process modifications** Anne Kantardjieff, Alexion Pharmaceuticals, USA
09:45 – 10:15	Coffee Break
10:15 – 10:40	**Controlling acidic variant formation and glycan profile through manipulation of culture temperature profile and media composition** Nathan McKnight, Genentech, USA
10:40 – 11:05	**BI-HEX® –optimising product quality attributes through host cell engineering and upstream process optimization** Anurag Khetan, Boehringer Ingelheim Pharma GmbH & Co. KG, Germany
11:05 – 11:30	**Effect of a media reducing agent on monoclonal antibody assembly and glycosylation In NS0 cell culture** Ben Dionne, University of Manitoba, Canada
11:30 – 13:00	Lunch
	Session II: Application of 'Omics in Biotherapeutic Process Development and Control Chairs: Michael Betenbaugh, Johns Hopkins University, USA Susan Sharfstein, SUNY Albany, USA Chetan Goudar, Bayer HealthCare, USA
13:00 – 13:30	**Genome-scale and analysis of Chinese hamster ovarian cell lines** Bernhard Palsson, CHOmics, Inc, USA
13:30 – 14:00	**Using CHO sequence databases for micro-RNA engineering** Nicole Borth, University of Natural Resources and Life Sciences, Austria
14:00 – 14:30	**A molecular profile of industrial cell culture: examining the transcriptome dynamics of recombinant protein producing fed-batch and perfusion cultures** Karthik P. Jayapal, Bayer HealthCare, USA

Monday, April 23, 2012 (continued)

14:30 – 15:00	**Deciphering CHO cells and bioprocess performance through metabolite profiling** Alan Dickson, University of Manchester, United Kingdom
15:00 – 15:45	Coffee Break
15:45 – 17:15	**Workshops**
17:15 – 18:30	Break – with posters available for viewing
18:30 – 20:30	Dinner (Crown Corral)
20:30 – 22:30	**Poster Session / Social Hours** (Authors of odd-numbered posters are asked to stay by their posters)

Tuesday, April 24, 2012

07:00 – 08:30	Breakfast
	Session III: Rapid Material Supply for R&D, Toxicology, Early Clinical Manufacturing, and Biodefense Chairs: Peter Gray, AIBN - University of Queensland, Australia Ashraf Amanullah, Gilead Sciences, Inc., USA
08:30 – 09:00	**Vector and cell engineering for rapid production of MABS in CHO cells** Trent Munro, University of Queensland, Australia
09:00 – 09:30	**Use of an anti-apoptotic host cell line for high throughput transient transfections** Athena Wong, Genentech Inc., USA
09:30 – 10:00	**Development of predictive methods for cell line selection and process development** Matthieu Stettler, Merck Serono, Switzerland
10:00 – 10:30	Coffee Break
10:30 – 11:00	**Development pipeline debottlenecking for increased speed and throughput of therapeutic antibody opportunities** Kevin Bailey, Regeneron Pharmaceuticals, Inc., USA
11:00 – 11:45	**Keynote** **Discovery and therapeutic optimization of the next generation of antibody drugs** George Georgiou, University of Texas at Austin, USA
11:45	Pick up Box Lunch
12:00 – 16:30	Free Time / *ad hoc* Sessions
15:30 – 16:30	Optional Afternoon Poster Session
	Session IV: Business and Regulatory Considerations for Managing the Lifecycle of Commercial Biologics Chairs: Andy Ramelmeier, BioMarin Pharmaceutical, USA Vince Anicetti, Keck Graduate Institute, USA
16:30 – 17:10	**Keynote** **Biosimilars and innovation** Barry Buckland, BiologicB LLC, USA
17:10 – 17:40	**Managing decisions across biopharmaceutical lifecycles from development through to commercial supply** Suzanne S. Farid, University College London, United Kingdom
17:40 – 17:50	Break
17:50 – 18:20	**Optimizing production and development work flows using real data, simulations, and design of experiments** Rick Johnston, Ph.D., Bio-G, USA

Tuesday, April 24, 2012 (continued)

18:20 – 18:50	**A novel bacterial contamination in cell culture manufacturing** Robert Kiss, Genentech, Inc., USA
18:50 – 19:20	**Regulatory considerations for managing lifecycle of biologics** Terry Milby, Biomarin Pharmaceutical Inc., USA
19:30 – 21:30	Dinner (Hacienda Plaza and Trellis)
21:30 – 22:30	**Poster Session / Social Hour** (Authors of even-numbered posters are asked to stay by their posters)

Wednesday, April 25, 2012

07:00 – 08:30	Breakfast
	Session V: Challenges and innovation in late stage process development and manufacturing sciences Chairs: Ellen Johnson, Amgen, Inc., USA Jeffrey Chalmers, The Ohio State University, USA Tongtong Wang, Eli Lilly & Company, USA
08:30 – 09:00	**Implementation of integrated continuous bioprocessing for the production of various types of therapeutic proteins** Konstantin Konstantinov, Genzyme, USA
09:00 – 09:30	**Improving our understanding of raw materials and their impact on cell culture processes** Gregg Nyberg, Amgen, USA
09:30 – 10:00	**The impact of lot-to-lot variability of a disposable cell culture bags on cell growth during the scale-up of a mammalian production cell line: Root cause analysis and lessons learned for the pipeline** Patrick Gammell, Pfizer, Ireland
10:00 – 10:30	Coffee Break
10:30 – 11:00	**On the challenges associated with establishing product quality comparability while transitioning from a peptone containing to a chemically defined process** Natarajan Vijayasankaran, Genentech, Inc., USA
11:00 – 11:40	**Young Investigator Keynote** **The clinical and scientific basis behind polyclonal antibody therapy** Jennifer Maynard, University of Texas at Austin, USA
11:40 – 13:00	Lunch
	Session VI: Designing Proteins, Vectors and Cells for Enhanced Biotherapeutic Production Chairs: Mark Smales, University of Kent, United Kingdom Rohini Deshpande, Amgen, Inc., USA
13:00 – 13:30	**Aberrant RNA splicing in therapeutic antibodies** Dennis P. Gately, Applied Molecular Evolution, Eli Lilly, USA
13:30 – 14:00	**Precise control of recombinant protein production by engineering translation initiation sites** Clifford L. Wang, Stanford University, USA
14:00 – 14:30	**Engineering Chinese hamster ovary (CHO) cells for producing recombinant proteins with simple glycoforms by zinc-finger nuclease (ZFN) -mediated gene knockout of N-acetylglucosaminyltransferase I (MGAT1)** Natalie Sealover, SAFC/Sigma-Aldrich, USA

Wednesday, April 25, 2012 (continued)

14:30 – 15:00	**Engineering CHO cells for improved productivity by overexpressing key enzymes of the galactose metabolism** Ziomara P. Gerdtzen, University of Chile, Chile
15:00 – 15:45	Coffee Break
15:45 – 17:15	**Workshops**
17:15 – 18:30	Break, with posters available for viewing
18:30 – 20:30	Dinner (South Pool)
20:30 – 22:30	**Poster Session / Social Hours** (Authors of odd-numbered posters are asked to stay by their posters)

Thursday, April 26, 2012

07:00 – 08:30	Breakfast
	Session VII: Emerging Technologies and Novel Applications Chairs: Manuel Carrondo, IBET - Instituto De Biologia Experimental E Tecnológica, Portugal Gargi Maheshwari, Merck & Company, USA
08:30 – 09:00	**A high-throughput assay to assess enzyme activity in central metabolism of production cell lines** Robert Janke, Max Planck Institute for Dynamics of Complex Technical Systems, Germany
09:00 – 09:30	**Technology improvements to accelerate process development of biologics** Krista Alvin, Merck & Co., Inc, USA
09:30 – 10:00	**Large scale manufacturing experience in single use bioreactors, specifics for anchorage dependent cell lines and vaccines** Jean-Marc Guillaume, Sanofi Pasteur, France
10:00 – 10:30	Coffee Break
10:30 – 11:00	**Engineering cellular function for enhancing cell and gene therapy product potency for oncology and regenerative medicine applications** Madhusudan V. Peshwa, MaxCyte, Inc., USA
11:00 – 11:30	**Human stem cells and primary cultures for drug discovery and cell therapy: Bioprocessing challenges** Paula M. Alves, ITQB-UNL/iBET, Portugal
11:30 – 13:00	Lunch
	Session VIII: Control and optimization of cell metabolism in culture Chairs: Weichang Zhou, Genzyme Corporation, USA Jamey D. Young, Vanderbilt University, USA
13:00 – 13:30	**Physiology of metabolic shifts in cultured mammalian cells - a mechanistic analysis and a scheme for metabolic control** Wei-Shou Hu, University of Minnesota, USA
13:30 – 14:00	**Preservation of a balanced cell culture environment for fed-batch processes** Yen-Tung Luan, Pfizer Inc., USA
14:00 – 14:30	**PCO_2 control in CHO fermentations: Bioprocess and metabolic engineering approaches** Thomas Noll, University of Bielefeld, Germany
14:30 – 15:00	**Elucidating the dynamics of metabolic fluxes in CHO cell cultures using 13C-dynamic metabolic flux analysis** Maciek R. Antoniewicz, University of Delaware, USA
15:00 – 15:45	Coffee Break

Thursday, April 26, 2012 (continued)

15:45 – 17:15 **Four Concurrent Chair Select Sessions**

Understanding CHO biology with application to bioprocessing
Chair: Mark Leonard, Pfizer, USA

15:45 – 16:00 **Intracellular targeting and role OF BCL-X in chinese hamster ovary cells**
Abasha Lewis, Johns Hopkins University, USA

16:00 – 16:15 **A kinetic study of endogenous unfolded protein response and its applications in CHO production culture**
Zhimei Du, Amgen, USA

16:15 – 16:30 **Exploring the transcriptome space of recombinant BHK cell through next generation sequencing**
Kathryn C. Johnson, University of Minnesota, USA

16:30 – 16:45 **Detail analysis of chromosome rearrangements in CHO cells using BAC-based physical map**
Takeshi Omasa, The University of Tokushima, Japan

16:45 – 17:00 **Mechanistic studies on the impact of pgam1 and other key genes in glycolysis on energy metabolism and protein glycosylation in IgG producing Chinese hamster ovary (CHO) cells**
Joaquina Mascarenhas, SAFC/Sigma Aldrich, USA

17:00 – 17:15 Group Discussion

Cell line development
Chair: Lin Zhang, Pfizer, USA

15:45 – 16:00 **Engineering CHO cells and vectors for improved transgene integration and antibody production**
Nic Mermod, University of Lausanne, Switzerland

16:00 – 16:15 **Utilizing a GFP tool to monitor efforts at improving GS-CHO cell line generation efficiency and productivity through highly stringent selection system**
Lianchun Fan, Eli Lilly & Company, USA

16:15 – 16:30 **Use of homologous recombination based genome editing for CHO cell line engineering**
Joshua Kapp, Horizon Discovery, United Kingdom

16:30 – 16:45 **CELL line generation, manufacturing, release and characterization of recombinant antibody mixtures**
Soren Rasmussen, Symphogen A/S, Denmark

16:45 – 17:00 **Adaptations of monoclonal antibody-producing CHO cell lines: Perspectives from genomics, transcriptome, glycomics and metabolomics**
Bernard Loo, BTI, Singapore

Thursday, April 26, 2012 (continued)

17:00 – 17:15 Group Discussion

Process Characterization and Quality Control
Chair: Nate Freund, Novavax, USA

15:45 – 16:00 **Evaluation of cell metabolism as a high throughput indicator of the impact of medium components on autologous cellular immunotherapy**
Pascal R Beauchesne, Dendreon Corporation, USA

16:00 – 16:15 **The metabolic load of heterologous protein expression in CHO cells**
Olivier Henry, Ecole Polytechnique de Montreal, Canada

16:15 – 16:30 **Impact of raw materials and manufacturing processes on dry powder cell culture media performance**
Aline Zimmer, Merck KGaA, Germany

16:30 – 16:45 **Resolving process variability with an increased understanding of cell metabolism**
Rashmi Kshirsagar, Biogen-IDEC, USA

16:45 – 17:00 **Development of a method to model the cell metabolism in varying environmental conditions based on extracellular component measurements**
Veronique Chotteau, KTH, Sweden

17:00 – 17:15 Group Discussion

Hydrodynamics in Industrial Cell Culture
Chair: Matthew Croughan, Keck Graduate Institute, USA

15:45 – 16:00 **Scale-down studies of the effect of hydrodynamic forces on CHO cells: Implications for industrial production conditions**
Steven Meier, Genentech, USA

16:00 – 16:15 **Effect on hydrodynamic conditions on expression of stress proteins, cell cycle, and recombinant protein productivity**
Claudia Berdugo, BD Biosciences, USA

16:15 – 16:30 **Mixing issues in cell culture bioreactors using microcarriers**
Alvin Nienow, University of Birmingham, United Kingdom

16:30 – 16:45 **Impact of bioreactor design on the performance of microcarrier cultures**
Manuel Carrondo, IQBT/ IBET, Portugal

16:45 – 17:00 **A method for assessing cell lysis-mediated monoclonal antibody reduction in industrial cell culture processes**
Brian Horvath, Genentech, Inc., USA

17:00 – 17:15 Group Discussion

17:15 – 18:00 Iced Tea and Lemonade Break

Thursday, April 26, 2012 (continued)

18:00 – 19:00	**CCE Award Lecture** Michael Betenbaugh, Johns Hopkins University, USA
19:00 – 20:00	Break
20:00 – 22:30	Banquet (Salons F and G)
	Poster Award Winners
	2012 CCE Award roast of James Piret, University of British Columbia, Canada
	Announcement of chairs for CCE XIV
	Announcement of upcoming ECI conferences by Paula Alves and Barry Buckland
	Closing remarks Matt Croughan, Keck Graduate Institute, USA Mark Leonard, Pfizer, USA

Friday, April 27, 2012

07:00 – 08:30 Breakfast and departures

Cell Culture Engineering XIII
Poster list

Posters are listed alphabetically by first name of the presenter. In nearly all cases, the presenter is the primary author. In a few cases, a poster is being presented by an attendee on behalf of a person who is not attending the conference. For all posters, the primary author is shown in the published abstract.

1. **Intercellular targeting and role of Bcl-xL in Chinese hamster ovary cells**
   Abasha Lewis, Johns Hopkins University, USA

2. **Pro-domain mutation leads to increased BMP-2 expression and reduced activity**
   Aileen J. Zhou, University of Toronto, Canada

3. **Polysaccharide derived from rakkyo is effective factor against freezing stress of mammalian cells**
   Akiko Ogawa, Suzuka National College of Technology, Japan

4. **Phase contrast microscopy image segmentation and analysis**
   Alain Garnier, Université Laval, Canada

5. **Metabolic characterization of recombinant Chinese hamster ovary (CHO) cells in batch culture**
   Alan J Dickson, University of Manchester, United Kingdom

6. **Volume distributions in CHO cell populations during adaptation to chemically defined medium**
   Alessandro tona, National Institute of Standards and Technology, USA

7. **Application of microrna for mammalian cells engineering**
   Aliaksandr Druza, Biotechnology Core Laboratory NIDDK, NIH, USA

8. **NMR-based metabolomics for cell culture engineering**
   Ana Teixeira, IBET/ITQB-UNL, Portugal

9. **Steady-state cultivation of Chinese hamster ovary cells for comparative physiological analyses**
   Andreas Maccani, ACIB - Austrian Centre of Industrial Biotechnology, Austria

10. **Development and implementation of a highly automated cell line development platform**
    Andrew Snowden, Amgen Inc., USA

11. **Implementation of automated miniature bioreactors for rapid process optimisation and development**
    Andrew Tait, TapBiosystems Ltd, United Kingdom

12. **Flux balance analysis (FBA) for quantifying CHO cell physiological response during a perfusion cultivation screening doe study**
    Anke Mayer-Bartschmid, Bayer Pharma AG, Germany

13. **Mixing issues in cell culture bioreactors using microcarriers**
    Alvin Nienow, University of Birmingham, United Kingdom

14. **Glycosylation of monoclonal antibodies for clinical trials and translational cancer research**
    Angelo Perani, Ludwig Institute for Cancer Research, Australia

15. **Evaluation of an impedance-based probe to detect early cell death events**
Angelo Perani, Ludwig Institute for Cancer Research, Australia

16. **Modulating product quality through cell line and process modifications**
Anne Kantardjieff, Alexion Pharmaceuticals, USA

17. **Application of RNAi in bioprocessing to improve product quality and biologic functionality**
Anthony Rossomando, Alnylam Pharmaceuticals, USA

18. **BI-HEX® –optimising product quality attributes through host cell engineering and upstream process optimization**
Anurag Khetan, Boehringer Ingelheim Pharma GmbH & Co. KG, Germany

19. **Microengraving: An emerging technology for clonal selection of highly productive cell lines**
Barry C. Buckland, BiologicB LLC, USA

20. **Effect of a media reducing agent on monoclonal antibody assembly and glycosylation in NS0 cell culture**
Ben Dionne, University of Manitoba, Canada

21. **Impact of media on the phenotypic stability of antibody-producing cell lines**
Benjamin Wang, MedImmune, USA

22. **Adaptations of monoclonal antibody-producing CHO cell lines: Perspectives from genomics, transcriptome, glycomics and metabolomics**
Bernard Loo, Bioprocessing Technology Institute, Singapore

23. **Rational cell culture process development based on basic biochemical engineering principles**
Bert Frohlich, Shire Human Genetic Therapies, Inc., USA

24. **Physiology of metabolic shifts in cultured mammalian cells - a mechanistic analysis and a scheme for metabolic control**
Bhanu Chandra Mulukutla, University of Minnesota, USA

25. **Fundamentals of dielectric spectroscopy: applications to cell-based process monitoring**
Brandon Downey, Bend Research Inc. USA

26. **Manganese modulates mAb galactosylation in Chinese hamster ovary cells cultured in chemically defined medium**
Brent Grisim, Amgen Inc., USA

27. **A method for assessing cell lysis-mediated monoclonal antibody reduction in industrial cell culture processes**
Brian Horvath, Genentech Inc., USA

28. **NOVEL PNEUMATIC MIXING FOR SINGLE-USE BIOREACTOR APPLICATION: A COMPARATIVE ANALYSIS OF CONSISTENCY ACROSS SCALES**
Brian Lee, PBS Biotech, Inc., USA

29. **Development of new transient recombinant protein expression systems based on the infection of CHO cells by optimized baculovirus vectors**
Bruno Gaillet, Université Laval, Canada

30. **Regulating the ER stress response to improve protein production in recombinant CHO cells**
Catherine Page, University of Manchester, United Kingdom

31. **Enhanced ADCC activity for an FC-containing protein produced in a GlcNAc T1 deficient CHO host**
Cecilia Cooley, Pfizer, Inc., USA

32. **Development of a CHO-S transient expression system to rapidly generate preclinical material supply**
Chanty Mariategue, Takeda California, Inc., USA

33. **Effect of growth medium exchange and dissolved oxygen concentration on the in vitro proliferation and metabolism of human mesenchymal stem cells: a quantitative approach**
Chris Hewitt, Loughborough University, United Kingdom

34. **Rapid, large-scale manufacture of immunotherapeutics**
Chris Warner, Keck Graduate Institute, USA

35. **Enhanced growth and productivity of CHO through RHSA media supplementation**
Christopher Shen, Keck Graduate Institute, USA

36. **Leveraging on the success of cd- supplement to optimize your production**
Claudia Berdugo, BD Biosciences, USA

37. **Effect of hydrodynamic conditions on expression of stress proteins, cell cycle and recombinant protein productivity**
Cladia Berdugo, BD Biosciences, USA

38. **Advanced microscale bioreactor, AMBR™, for the rapid screening of biopharmaceutical producing cell lines**
Clayton L. Casipit, OncoMed Pharmaceuticals, USA

39. **An *in vitro* model of vascular regeneration to advance cardiovascular regenerative medicine**
Corinne Hoesli, Université Laval, Canada

40. **Evaluation of the ambr® micro reactor system**
Craig Zupke, Amgen Inc., USA

41. **Insights into cell physiology phenomenon for multiple CHO batch processes using multivariate analysis and genetic algorithms for in-line dielectric spectroscopy and off-line bioprocess data streams**
Dan Logan, Aber Instruments, United Kingdom

42. **On-line monitoring of the live cell concentration in disposable bioreactors**
Dan Logan, Aber Instruments, United Kingdom

43. **Systematic development of a defined medium for the expansion of functional human keratinocytes**
Imad Debbah, Université Laval, Canada

44. **The tubespin® bioreactor 600: Orbshake technology for mammalian cell cultivation in suspension**
Dominique T. Monteil, École Polytechnique Fédérale de Lausanne, Switzerland

45. **Comparison of a traditional CHO amplification cell line development method for antibodies with the GPEX® (gene product expression) system**
Dona York, Catalent Pharma Solutions, USA

46. **Screening cell culture conditions to reduce protease clipping in a fusion protein**
Donald Olson, Eli Lilly, USA

47. **Characterizing hESC metabolism by systems biological approach**
Dong-Yup Lee, National University of Singapore, Singapore

48. **Microline: A disposable approach to early phase clinical manufacturing**
Ekta Mahajan, Genentech Inc., USA

49. **Protein expression in defined chromosomal loci of Sf9 insect cells: a valuable alternative to baculovirus infection**
Fabiana Fernandes, IBET/ITQB-UNL, Portugal

50. **Optimisation of CHO transient transfections to obtain high titre antibody expression**
Fay Saunders, UCB Celltech R&D, United Kingdom

51. **Evolution from the conventional stirred tank bioreactor vessel: cultivation of mammlian cell lines using a disposable gradient-free cell-trap bioreactor to achieve high cell growth potential without the use of external membrane device in perfusion mode**
Frank Jing, Fogale Biotech, USA

52. **Development of a robust bioprocess for Ambrx's mAb production**
Frank Song, Ambrx, Inc., USA

53. **MALDI-TOF MS - a fast and simple tool for cell line identification and characterization of eukaryotic protein expression**
Georg Schmid, F. Hoffmann-La Roche AG, Switzerland

54. **Large-scale experiences with the hipdog (high-end pH-controlled delivery of glucose) technology in CHO fed-batch culture**
Gregory Hiller, Pfizer, Inc., USA

55. **Scale-up of 10L to 250L scale bioreactor for fed-batch process producing monoclonal antibody using CHO cell line in chemically defined medium**
Grietsie Kuiken, Synthon B.V., The Netherlands

56. **Revisiting to the mechanism of rapamycin: Autophagy induction in recombinant CHO cells for enhanced antibody production**
Gyun Min Lee, KAIST, Korea

57. **Constructs and methodologies for high-level transgene expression**
Hal Alper, The University of Texas at Austin, USA

58. **Continuous improvement of commercial drug substance upstream process throughout product lifecycle: Robustness improvement**
Hang Yuan, Biogen Idec, Inc., USA

59. **Rapid development and characterization of an HTST pasteurization process for commercially-used, soy hydrolysate-containing cell culture medium**
Harmit Vora, BioMarin Pharmaceutical, USA

60. **Novel strategy for a high yielding mAb-producing CHO strain (overexpression of cysteine sulfinic acid decarboxylase [CSAD] caused beta-alanine biosynthesis and improved mAb yield)**
Hisahiro Tabuchi, Chugai Pharmaceutical Co., LTD, Japan

61. **An analytical and cell culture platform for the development of a biosimilar**
Holly Prentice, Momenta Pharmaceuticals, USA

62. **Implementation of 3l disposable reactors for use as a direct scale-up for cgmp manufacturing**
Howard Clarke, CMC Biologics Inc., USA

63. **The effects of cell culture process and supplement on monoclonal antibody n-glycosylation**
Hui-Chun Li, Development Center for Biotechnology, Taiwan

64. **Mining cell culture manufacturing data for enhancing process performance**
Huong Le, University of Minnesota, USA

65. **Transcriptome dynamics of transgene expression and amplification in CHO cell line development**
Huong Le, University of Minnesota, USA

66. **Understanding transcriptional enhancement in mAb producing CHO cells**
Hussain Dahodwala, University at Albany, USA

67. **Engineering CHO cells and vectors for improved transgene integration and antibody production**
Igor Fisch, Selexis SA, Switzerland

68. **Improved cell banking operations using disposables**
Inn Yuk, Genentech Inc., USA

69. **Maximizing hemagglutinin yields in fed-batch cultures using a baculovirus expression vector system**
Jamal Meghrous, Protein Sciences Corporation, USA

70. **Process characterization and validation for cell culture processes: challenges and opportunities**
Janosch Rieger, Boehringer Ingelheim Pharma GmbH & Co. KG, Germany

71. **Process optimization and scale-up challenges in the development of a large-scale phase iii manufacturing process**
Jason Goodrick, Genentech Inc., USA

72. **Utilizing a GFP tool to monitor efforts at improving GS-CHO cell line generation efficiency and productivity through highly stringent selection system**
Jeffrey L Larson, Eli Lilly & Company, USA

73. **Dissecting the mechanisms of phenotypical instability in antibody production CHO cell lines**
Jie Zhu, MedImmune, USA

74. **Mechanistic studies on the impact of PGAM1 and other key genes in glycolysis on energy metabolism and protein glycosylation in IgG producing Chinese hamster ovary (CHO) cells**
Joaquina Mascarenhas, SAFC/Sigma Aldrich, USA

75. **Impact of aeration strategies on fed-batch cell culture kinetics in a single-use 24-well bioreactor**
John Betts, University College London, United Kingdom

76. **Analysis of the performance of eight commercially available recombinantly produced human insulin's in MRC-5, MDCK and sp0/2 cell lines**
John F Menton, Sheffield Bioscience, USA

77. **Comparison of the efficacy and toxicity of three commercially available recombinant trypsins against porcine trypsin in six different cell lines**
John F Menton, Sheffield Bioscience, USA

78. **Upregulation of histone deacetylase (HDAC) activity is associated with long term expression instability in a BHK21 cell line during continuous perfusion culture**
John Thrift, Bayer HealthCare, USA

79. **Development of the EPI-CHO transient expression system for improved mab production**
Jong Wei Wooh, Australian Institute for Bioengineering and Nanotechnology, Australia

80. **Metabolic engineering of Chinese hamster ovary cells: Production and characterization of heparin**
Jong Youn Baik, University at Albany, USA

81. **Effect of amino acid addition on cell growth of human hybrid F2N78 cells**
Joon Serk Seo, Inha University, Korea

82. **Use of homologous recombination based genome editing for CHO cell line engineering**
Joshua Kapp, Horizon Discovery, United Kingdom

83. **Understanding increased c-terminal lysine in a recombinant monoclonal antibody production using Chinese hamster ovary cells with chemically defined media**
Jun Luo, Genentech Inc., USA

84. **Use of a robust CHO platform for expression of viral glycoproteins**
Jurgen Mullberg, Novartis V&D, USA

85. **Comparison of performance-enhancing effects of supplementation with a complex feed system when applied to multiple CHO basal medias**
Karen A Benedict, Sheffield Bioscience, USA

86. **Design of experiment (DOE) studies to evaluate process robustness in high density perfusion mammalian cell cultures**
Karthik P. Jayapal, Bayer Healthcare, USA

87. **Scalability of the disposable Mobius® cellready stirred tank bioreactors**
Kathleen Thiel, EMD Millipore, USA

88. **Exploring the transcriptome space of recombinant BHK cells through next generation sequencing**
Kathryn Johnson, University of Minnesota, USA

89. **Evaluation of different quenching and extraction methods used for nucleotide / nucleotide sugar analysis**
Katrin Braasch, University of Manitoba, Canada

90. **CHOgenome.org – an online resource for the CHO genome**
Kelvin H. Lee, University of Delaware, USA

91. **Development pipeline debottlenecking for increased speed and throughput of therapeutic antibody opportunities**
Kevin Bailey, Regeneron Pharmaceuticals, Inc., USA

92. **A flow cytometry-based method for predicting expression stability in monoclonal antibody producing cell lines**
Kevin Smith, Janssen R&D, USA

93. **Mammalian cell biotechnology laboratory course at Keck Graduate Institute (KGI)**
KiriLynn Svay, Keck Graduate Institute, USA

94. **Development and application of an automated, multiwell plate based screening system for suspension cell culture**
Klaus Joeris, Roche Diagnostics GmbH, Germany

95. **Establishment of a novel gene amplification platform by ATR down- regulation in CHO cell lines**
Kyoungho Lee, Osaka University, Japan

96. **Importance of the end of run studies and real time monitoring for the evaluation of a microcarrier based cell culture perfusion process**
Lada Laenen, Genzyme, A Sanofi Company, Belgium

97. **Emerging role of Kaiser Raman in cell culture applications**
Larry West, Kaiser Optical Systems, USA

98. **Temporal optimization of VPA addition during transient expression in HEK293 cells increases final protein yield**
Laust Bruun Johnsen, Novo Nordisk A/S, Denmark

99. **Screening of animal-component-free media for the culture of CHO cells in shaken tubes and stirred-tank bioreactors**
Leda R. Castilho, Federal University of Rio de Janeiro, Brazil

100. **A systems biotechnology platform to optimise the expression of mAb sequence variants in CHO cells**
Leon P. Pybus, The University of Sheffield, United Kingdom

101. **Application of design space principles for the characterization of late stage cell culture processes**
Lia Tescione, Biogen Idec, Inc., USA

102. **Utilizing a GFP tool to monitor efforts at improving GS-CHO cell line generation efficiency and productivity through highly stringent selection system**
Lianchun Fan, Eli Lilly & Company, USA

103. **Targeting transformational production of biotherapeutics: Application of a process-development methodology leveraging coupled bioreactor monitoring and feedback tools and an automated aseptic sampling (AAS) system**
Lisa Graham, Bend Research Inc., USA

104. **Impact of aeration on Chinese hamster ovary cells physiology and structure during batch culture**
Lourdes Velez-Suberbie, University College London, United Kingdom

105. **Rapid production of gram-scale proteins and high titer viral vectors using a CGMP-compliant, scalable transient transfection system based on flow electroporation**
Madhusudan V. Peshwa, MaxCyte, Inc., USA

106. **Clonal variability and chromosomal heterogeneity in Chinese hamster ovary cell lines**
Mai Takahashi, The University of Tokushima, Japan

107. **Integrating functional genomics tools to survey retrovirus production in human cells**
Manuel Carrondo, IBET/ITQB-UNL, Portugal

108. **Impact of bioreactor design on the performance of microcarrier cultures**
Manuel Carrondo, IBET/ITQB, Portugal

109. **Development, qualification, and application of a scale-down bioreactor model to support a microcarrier-based perfusion cell culture commercial manufacturing process**
Marcella Yu, Genzyme Corporation, USA

110. **Application of soft-sensors in pharmaceutical biotech production**
Marco Jenzsch, Roche Pharma Biotech, Germany

111. **A powerful 3D culture strategy for integrating expansion and cryopreservation of human embryonic stem cells**
Margarida Serra, IBET/ITQB-UNL, Portugal

112. **Bioengineering approaches for the development of robust processes for the production of IPSC-derived cardiomyocytes**
Margarida Serra, IBET/ITQB-UNL, Portugal

113. **Novel human central nervous system 3D in vitro models: useful tools for preclinical evaluation of viral vectors**
Margarida Serra, IBET/ITQB-UNL, Portugal

114. **Speed up process development and clinical manufacturing using disposable stirring tank reactors**
Marie Zhu, Agensys/Astelas Inc, USA

115. **Engineering autophagy in CHO cells to increase protein production in fed-batch processes**
Mario A. Jardon, University of British Columbia, Canada

116. **A kinetic-metabolic model for CHO cells**
Mario Jolicoeur, Ecole Polytechnique de Montréal, Canada

117. **A novel method of grouping amino acids for media optimization**
Mark C. Arjona, Irvine Scientific, USA

118. **A single medium formulation enables rapid CHO cell line process development**
Mark J. Stramaglia, Life Technologies Corporation, USA

119. **Development of a global Roche cell culture platform: leveraging knowledge from two legacy platform processes**
Martin Gawlitzek, Genentech Inc., USA

120. **Medium conditions influence the tertiary structure of the t-pa by reducing / oxidizing the cys182-cys313 disulfide bond**
Masami Yokota, Astellas Pharma Inc., Japan

121. **Suppression of antibody aggregation in CHO cell culture by trehalose addition**
Masayoshi Onitsuka, The University of Tokushima, Japan

122. **A semi-continuous fed-batch approach to increase volumetric productivity**
Matthew Gagnon, Pfizer, Inc., USA

123. **Technical transfer and validation of the cell culture process for the commercial production of a protein – a case study**
Matthew Osborne, Eli Lilly & Co. Kinsale, Ireland

124. **Microrna biogenesis in CHO cells: the impact of dicer and drosha mediated mirna processing on CHO cell phenotpye**
Matthias Hackl, BOKU University, Austria

125. **Computational identification of microrna gene loci and precursor microrna sequences in CHO cell lines**
Matthias Hackl, BOKU University, Austria

126. **Mixing uniformity characterization of 15,000l mammalian cell culture bioreactor**
Mei Shao, MedImmune, USA

127. **Evaluation and characterization of the advanced microscale bioreactor (ambr) system for use in antibody cell line development**
Melisa Carpio, Takeda San Francisco, USA

128. **Toward online control of glycosylation in mAbs**
Melissa M. St. Amand, University of Delaware, USA

129. **The changing dielectric properties of CHO cells can be used to determine early apoptotic events in a bioprocess**
Michael Butler, University of Manitoba, Canada

130. **Phytoplankton extracts as media supplements support growth and productivity of recombinant CHO cells**
Michael Butler, University of Manitoba, Canada

131. **Use of live cell microscopy and image analysis to follow the temporal regulation of gene expression and potential applications to protein production in CHO cells**
Michael Halter, National Institute of Standards and Technology, USA

132. **A comparison of shear stress induced pluripotency in two-dimensional and three-dimensional embryonic stem cell cultures**
Michael S. Kallos, University of Calgary, Canada

133. **Molecular mechanism of antibody disulfide bond reduction in CHO cell culture processes**
Michael W. Laird, Genentech Inc., USA

134. **A novel strategy to reduce both lactic acid and ammonia production in animal cell culture**
Nate W. Freund, Keck Graduate Institute, USA

135. **Rapid large-scale production of novel influenza virus like particle vaccines using the Sf9 - baculovirus expression system**
Nate W. Freund, Novavax, Inc, USA

136. **Optimisation of the expansion and differentiation of embryonic stem cells on an automated microwell platform**
Nathalie Moens, University College London, United Kingdom

137. **The mammalian upr components ATF6 and erse can be used together to enhance production of 'difficult to express' proteins**
Nathan West, University of Sheffield, United Kingdom

138. **Distinct metabolic phases of an industrial CHO cell fed-batch process characterized by 13C flux analysis**
Neil Templeton, Vanderbilt University, USA

139. **Analysis of the secretome of Chinese hamster ovary (CHO) cells**
Nicole Borth, BOKU University, Austria

140. **CAP: A protein and vaccine production platform based on immortalized human amniocytes**
Nicole Faust, Cevec Pharmaceuticals GmbH, Germany

141. **Controlling high mannose glycan level and optimizing titer through a balanced modulation of cell culture process and medium changes**
Nicole Le, Amgen Inc., USA

142. **Control of polyplex mediated transfection of CHO cells**
Olivia L. Mozley, The University of Sheffield, United Kingdom

143. **The metabolic load of heterologous protein expression in CHO cells**
Olivier Henry, Ecole Polytechnique de Montréal, Canada

144. **Evaluation of cell metabolism as a high throughput indicator of the impact of medium components on autologous cellular immunotherapy**
Pascal R Beauchesne, Dendreon Corporation, USA

145. **Perfusion bioreactor culture of human liver cell spheroids for repeated-dose long-term drug testing**
Paula Alves, IBET/ITQB-UNL, Portugal

146. **Engineering the energy metabolism and lactate production in mammalian cells producing complex biopharmaceuticals: down-regulation of the warburg effect**
Paula Alves, IBET/ITQB-UNL, Portugal

147. **Implementation and performance of a high-throughput cell culture system for process development**
Peter Harms, Genentech Inc., USA

148. **Systems biology analysis of IgG1 producing CHO cells considering cellular compartments**
Ralf Takors, Institute of Biochemical Engineering, Germany

149. **Resolving process variability with an increased understanding of cell metabolism**
Rashmi Kshirsagar, Biogen-IDEC, USA

150. **Exchange flow and cell lateral migration in rotating cylindrical filters for animal cell perfusion culture: A CFD study**
Ricardo Medronho, Federal University of Rio de Janeiro, Brazil

151. **The use of existing animal cell culture facilities to make insect cell culture expressed influenza vaccine**
Robert Boulanger, Protein Sciences Corporation, USA

152. **The way to a design space for an animal cell culture process according to QBD**
Robert Puskeiler, Roche Diagnostics GmbH, Germany

153. **The use of free light chain as a product quality indicator**
Robert Smith, EMD Millipore, USA

154. **Analysis of the activation status of the PI3K/AKT and Ras/MAPK signalling pathways and their roles in the serum-free, suspension adaptation of CHO cells**
Robert Whitfield, The University of Sheffield, United Kingdom

155. **Advance multivariate modeling: a comprehensive tool for IgG process development and manufacturing activities**
Ronald Eimers, MSD (Merck), The Netherlands

156. **Application of single-use bioreactors for the rapid production of pre-clinical and clinical biopharmaceuticals**
Rüdiger Heidemann, Bayer HealthCare Pharmaceuticals, USA

157. **Evaluation of long-term cryobag storage of mammalian cells for direct bioreactor inoculation**
Rüdiger Heidemann, Bayer HealthCare Pharmaceuticals, USA

158. **Technology lifecycle management – increasing process performance and robustness by implementing new technologies in existing processes**
Salim Charaniya, Genentech Inc., USA

159. **Cell line development tool box for expression: *e.coli*, CHO, insect cells**
Sam Ellis, Thomson Instrument Company, USA

160. **Effect of endoplasmic reticulum stress modulators on protein secretion in recombinant cell lines**
Sarika Mehra, Indian Institute of Technology, India

161. **Culture supplement for mammal-free medium**
Satoshi Terada, University of Fukui, Japan

162. **Development of Raman spectroscopy based process monitoring and control technology**
Scott Estes, Biogen Idec, Inc., USA

163. **Improvement of cell-freezing technologies and disposable bioreactors allow to perform fully closed usp process**
Sebastien Ribault, Merck Biodevelopment, France

164. **Data fusion based assessment of raw materials in mammalian cell culture**
Seongkyu Yoon, University of Massachusetts Lowell, USA

165. **Metabolic modeling of a cell culture process**
Shailendra Singh, MedImmune LLC, USA

166. **Comparability studies of cell culture for monoclonal antibody production in minibioreactors and bench scale bioreactors**
Shaunak D. Uplekar, University of Maryland Baltimore County, USA

167. **Overcoming barriers to creating high concentration pH-neutral feed supplements for CHO fed batch cultures**
Shawn Barrett, Life Technologies Corporation, USA

168. **Challenges and opportunities in the production of a baculovirus/insect cell-derived recombinant protein antigen for cancer immunotherapy**
Shue-Yuan Wang, Dendreon Corporation, USA

169. **Insight on scaling-up serial propagation of mammalian cell on microcarriers through mechanistic modeling**
Siguang Sui, University of Minnesota, USA

170. **Cell line generation, manufacturing, release and characterization of recombinant antibody mixtures**
Søren K. Rasmussen, Symphogen A/S, Denmark

171. **Effects of high passage cultivation on CHO cells: A global analysis**
Stefan Northoff, TeutoCell AG, Germany

172. **RNA interference of cofilin improves recombinant protein productivity in Chinese hamster ovary cells**
Stephanie Hammond, University of Delaware, USA

173. **Prototype testing of a novel single-use bioreactor system**
Stephen Hsu, Keck Graduate Institute, USA

174. **Scale-down studies of the effect of hydrodynamic forces on CHO cells; Implications for industrial production conditions**
Steven Meier, Genentech Inc., USA

175. **Overcoming antibody expression challenges by light chain engineering**
Sujeewa D Wijesuriya, XOMA (US) LLC, USA

176. **Development of in-process control strategies via integrated process characterization**
Susan Abu-Absi, Bristol-Myers Squibb, USA

177. **Differential effect of reduced culture temperature on the expression and biophysical properties of monoclonal antibody variants**
Susan T. Sharfstein, University at Albany, USA

178. **Quick resolution of the effect of storage conditions of a commercial medium on averting a potential failure of a phase iii monoclonal antibody production process**
T. Craig Seamans, Merck & Co., Inc, USA

179. **Upstream culture development and external technology transfer: case study for a phase iii monoclonal antibody production process**
T. Craig Seamans, Merck Research Laboratories, USA

180. **Detail analysis of chromosome rearrangements in CHO cells using bac-based physical map**
Takeshi Omasa, The University of Tokushima, Japan

181. **Vial thaw investigation during tech transfer of a GS-CHO Ab process**
Thomas Black, Eli Lilly S.A., Ireland

182. **Aspects of solid-liquid separation in pharmaceutical biotech production – characterisation, optimization and scale down of this process**
Thorsten Kaiser, Roche Pharma Biotech, Germany

183. **Orbital shaken bioreactors in the field of cell cultivation**
Tibor Anderlei, Adolf Kuhner AG, Switzerland

184. **Rapidly delivering the next generation of protein therapeutics, vaccines and reagents using design of experiment (DOE), quality by design initiatives and high-throughput technologies**
Tiffany D Rau, Pall Corporation, USA

185. **Integrated continuous bioprocessing; union of process technologies enabling future processing flexibility**
Timothy Johnson, Genzyme Corporation, USA

186. **Gene expression profiles in ATF4-overexpressing CHO cell line**
Tomomi Tsutsui, The University of Tokushima, Japan

187. **Glycomics to investigate the impact of process changes on product quality in cell culture-based influenza vaccine production**
Udo Reichl, Max Planck Institute for Dynamic of Complex Technical Systems, Germany

188. **CHO-engimirs: Growth enhancement by the miR-17-92 cluster in CHO cells**
Vaibhav Jadhav, BOKU University, Austria

189. **Comparative metabolic flux analyses of cultivations with novel avian designer cell lines used for vaccine production**
Verena Lohr, Max-Planck-Institute for Dynamics of Complex Technical Systems, Germany

190. **Development of a method to model the cell metabolism in varying environmental conditions based on extracellular component measurements**
Veronique Chotteau, KTH, Sweden

191. **Very high CHO cell density by ATF or TFF external filter perfusion in wave bioreactor™**
Veronique Chotteau, KTH, Sweden

192. **Microfluidic platform for rapid clonal selection of highly productive cell lines**
Véronique Lecault, University of British Columbia, Canada

193. **Manufacturing flexibility: Concepts and approaches**
WeiWei Hu, Biogen Idec, Inc., USA

194. **Characterization and selection of suspension cell lines for future viral vaccine production platforms**
Wilfried A.M. Bakker, RIVM, The Netherlands

195. **13c-metabolic flux analysis reveals metabolic rewiring of CHO cell metabolism in the transition from growth phase to stationary phase**
Woo Suk Ahn, University of Delaware, USA

196. **Efficient polymer-mediated transient gene expression in serum-free Sf9 cells in tubespin® bioreactors**
Xiao Shen, École Polytechnique Fédérale de Lausanne, Switzerland

197. **Establishment of mammalian cell line suitable for producing recombinant protein using mutation induced by high energy beam radiation**
Yasuhito Chida, University of Fukui, Japan

198. **Differential induction of autophagy in caspase-3/7 downregulating and Bcl-2 overexpressing rCHO cells upon nabu treatment**
Yeon Jung Kim, KAIST, Korea

199. **Tricistronic vector for enhancing generation of high monoclonal antibody producing CHO cell lines**
Yuansheng Yang, Bioprocessing Technology Institute, Singapore

200. **Multi-dimensional process modeling for characterization of a CHO fed-batch process**
Yun Jiang, Swedish Orphan Biovitrum, Sweden

201. **Qualification of scale down bioreactors for validation of process changes in commercial production**
Yuval Shimoni, Bayer HealthCare, USA

202. **Development of a scale-down model of the inactivated polio vaccine production process**
Yvonne E. Thomassen, RIVM, The Netherlands

203. **A kinetic study of endogenous unfolded protein response and its applications in CHO production culture**
Zhimei Du, Amgen Inc., USA

204. **A rationally integrated approach for fed-batch cell culture process optimization**
Zhou Jiang, Life Technologies Corporation, USA

205. **Improving productivity of CHO cells cultures by enhancing energy metabolism during cell growth**
Ziomara P. Gerdtzen, University of Chile, Chile

206. **Regulation of protein productivity by micrornas in CHO cells**
Bernard Loo, Bioprocessing Technology Institute, Singapore