

*Final Program*

# **Cell Culture Engineering IX**

**March 7-12, 2004**

**Paradisus Riviera Maya Cancún  
Cancún, México**

*Conference Co-Chairs:*

**Octavio T. Ramírez**  
**Universidad Nacional Autónoma de México**

**Lynne Krummen**  
**Genentech, Inc.**

# **ECI**

**Engineering Conferences International  
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## **Awards**

Merck & Co., Inc., an organization with over 40 years' history in the field of biologicals production from cell culture, has agreed to establish awards to be given at the Cell Culture Engineering conference series.

### *The Merck Award for Cell Culture Engineering*

To be given in honor of contributions to the field, and significant service and dedication to the profession. The inaugural award for Cell Culture Engineering VIII was presented to Professor Wei-Shou Hu, University of Minnesota.

### *The Merck Award for Best Poster*

To be given to the poster which best satisfies the judges' criteria for impact and relevance, scientific approach and methodology, and quality of presentation.

### *The Merck Award for Best Student Poster*

To be given to the student poster that best satisfies the judges' criteria for impact and relevance, scientific approach and methodology, and quality of presentation.

The awards will be presented at the Conference banquet

**Sunday, March 7, 2004**

- 10:00 – 17:00      Tutorial (separate registration)  
**Applications of Biochemical Engineering Principles to Cell Culture Process Development**  
Jeff Chalmers, Ohio State University, USA  
Lars Nielsen, University of Queensland, Australia
- 14:00 – 19:00      Registration
- 18:00 – 18:30      Welcome  
Conferences Chairs: Octavio T. Ramírez and Lynne Krummen  
ECI Technical Liaison: Allen Laskin
- 18:30 – 19:30      **KEYNOTE**  
***Cell Proliferation and Apoptosis in Cancer: Going from in vitro to in vivo***  
Gerard I. Evan  
Cancer Research Institute, University of California-San Francisco, USA
- 19:30 – 21:00      Dinner followed by Welcome Reception in Paradisus at Market Place  
(with Mariachis)
- 21:00 –              Social hour at the Lobby bar

## Monday, March 8, 2004

- 07:00 – 08:30 Breakfast (Market Place or Capri)
- 08:30 – 10:30 **SESSION 1: Post-translational Processing and Product Quality**  
Session Chairs: Mike Butler, University of Manitoba, Canada  
Theresa A. Good, University of Maryland Baltimore County, USA
- 08:30 – 09:15 **The Influence of Glycosylation on the Structure and Function of Human Antibody Molecules**  
Roy Jefferis, Yusuke Mimura, John Lund, Margaret Goodall, University of Birmingham, UK
- 09:15 – 09:40 **Optimizing Biotherapeutics for Improved Yields, Stability and Clinical Development.**  
Scott K. Wooden, Applied Molecular Evolution. USA
- 09:40 – 10:05 **Effect of Increased Levels of Protein Disulfide Isomerase and BIP/GRP78 on Human Antibody Production in Recombinant CHO Cells**  
Nicole Borth, Diethard Mattanovich, Renate Kunert, Hermann Katinger, Institute for Applied Microbiology, University of Applied Life Sciences, Austria
- 10:05 – 10:30 **Identification and Characterization of Antibody Cleavage and Deamidation in CHO cultures**  
Xuejun (Sherry) Gu, Theresa Zawistowski, Andy Rusiniak, Eli Lilly, USA
- 10:30 – 11:00 Coffee Break
- 11:00 – 12:30 **SESSION 2: Cell Physiology and Metabolism**  
Session Chairs: Dana C. Andersen, Genentech, Inc., USA  
Lena Häggström, Royal Institute of Technology, Stockholm, Sweden
- 11:00 – 11:36 **ER Stress Signaling Due to Over Accumulation of Proteins: Significance for Large Scale Protein Production**  
Renata E. Cudna, Idsada Lengwehasatit, Alan Dickson, University of Manchester, UK
- 11:36 – 11:54 **The Use of Long<sup>TM</sup>R3IGF-I for the Maintenance of CHO Cells in Serum-Free Production Media: The Role of Intracellular, Anti-Apoptotic Signalling Molecules.**  
Tony Simula, C. A. Yandell, I. P. Butler, Lawson J., B. Wade, GroPep Limited, Australia

- 11:54 – 12:12      **Enhanced Human Thrombopoietin Production by Sodium Butyrate Addition to Serum-Free Suspension Culture of Apoptosis-Resistant CHO Cells**  
Gyun Min Lee, Yun Hee Sung, KAIST, Korea
- 12:12 – 12:30      **Pausing of CHO Cells**  
Florian Wurm, Lisa Hunt, David Hacker, Martin Jordan, Maria De Jesus, Swiss Federal Institute of Technology Lausanne, Switzerland.
- 12:30 – 14:30      **POSTER SESSION I – *With Grazing Lunch***  
Poster Chairs:  
Ilse Blumentals, Merck & Co., USA  
Georg Schmid, Hoffman-LaRoche, Switzerland  
Robert Balcarcel, Vanderbilt University, USA  
Takeshi Omasa, Osaka University, Japan
- 14:30 – 15:15      *Ad hoc* sessions, relaxation, recreation
- 15:15 – 17:15      **WORKSHOPS I** (three simultaneous workshops)  
General Workshop Coordinator: Dhinakar S. Kompala, University of Colorado  
**A. Cell Line and Process Characterization: Agency Expectations in 2004**  
Workshop Chairs: Sally Seaver, Seaver & Associates  
Carole Heath, Amgen, USA  
Invited Panelist: Emily Shacter, FDA, USA  
**B. Strategies and Systems for High Throughput Expression and Screening**  
Workshop Chairs: Florian M. Wurm, Swiss Federal Institute of Technology, Switzerland  
Dawn R. Applegate, Applegate and Associates, Inc., USA  
**C. Scale-down Modeling of Mab and r-Protein Manufacturing Processes for Approval and Post-Market Process Changes**  
Workshop Chairs: Robert Kiss, Abgenix; Craig Zupke, Amgen, USA
- 17:15 - 17:45      Coffee Break
- 17:45 – 19:15      **SESSION 3: Genomic and Proteomics for Product Discovery and Process Development**  
Session Chairs: David C. James, University of Queensland, Australia  
Gyun Min Lee, KAIST, Korea
- 17:45 – 18:08      **DNA-Array Based Transcriptional Analysis of Cell-Culture Parameter Effects on Ex Vivo Expanded T Cells**  
Terry Papoutsakis, Dirk Windgassen, Northwestern University, USA  
Hadar Adams, Amgen Corporation, USA  
Christopher G Ramsborg, Carlos J Paredes, Northwestern University, USA



- 18:08 – 18:31      **Comparative Proteomic Analysis of GS-NSO Murine Myeloma Cell Lines with Varying Specific Monoclonal Antibody Production**  
 C. Mark Smales, Daniel E. Alete, Elizabeth A. Sage, University of Kent, UK  
 John R. Birch, Andrew J. Racher, Lonza Biologics, UK  
 Carol T. Marshall, GlaxoSmithKline, UK  
 Diane M. Dinnis, Scott H. Stansfield, David C. James, University of Queensland, Australia
- 18:31 – 18:53      **Gene Discovery in Chinese Hamster Ovary Cells by EST Sequencing, Microarray, and a Comparative Sequence Database**  
 Katie F. Wlaschin, University of Minnesota, USA  
 Anette Rink, University of Nevada, Reno, USA  
Peter Morin Nissom, Miranda Yap, Bioprocessing Technology Centre, A\*STAR, Singapore  
 Wei-Shou Hu, University of Minnesota, USA
- 18:53 – 19:15      **Improving CHO Transgene Expression and Vector Design Through the Use of DNA Oligo Microarrays**  
Mark Melville, Kevin McCarthy, Robin Heller-Harrison, Louane Hann  
 Wyeth BioPharma, USA
- 19:15 – 20:15      **SPECIAL KEYNOTE on PREHISPANIC MEXICO**  
***Maya-Central Mexican Relations: Interdisciplinary Approaches***  
 Linda Manzanilla  
 Universidad Nacional Autónoma de México, Mexico
- 20:15 – 22:00      Dine around through any of the six hotel restaurants
- 22:00 – 23:00      Social Hour with light entertainment

**Tuesday, March 9, 2004**

07:00 – 08:30 Breakfast (Market Place or Capri)

08:30 - 10:30       **SESSION 4: Cell Engineering**  
Session Chairs: Michael J. Betenbaugh, Johns Hopkins University, USA  
Pranhitha Reddy, Amgen, USA

08:30 – 09:20       **Specificity of Transcriptional Regulation through Chromatin**  
Beverly M. Emerson, Salk Institute for Biological Studies

09:20 – 09:40       **Conditional Transdifferentiation Engineering Enables Precise Adipocyte-Monocyte-Osteoblast Lineage Control in Multipotent Cells**  
Martin Fussenegger, Cornelia Fux, Wilfried Weber, Beat P. Kramer  
ETH Institute of Biotechnology, Switzerland

09:40 – 10:10       **Biochemical Engineering of Cell Surface Sialic Acid**  
Rudiger Horstkorte, Werner Reutter  
Charite - Universitaetsmedizin, Germany

10:10 – 10:30       **Identifying and Manipulating Cellular Pathways and Processes to Improve Culture Performance**  
Dana C. Andersen, Genentech, Inc. USA

10:30 – 11:00       Coffee Break

11:00 – 12:00       **KEYNOTE**  
***Epigenetic Gene Regulation by Small RNAs in Mammalian Cells***  
Thomas Tuschl  
Rockefeller University, USA

12:00 – 14:00       **POSTER SESSION I – With Grazing Lunch**  
Poster Chairs:  
Ilse Blumentals, Merck & Co., USA  
Georg Schmid, Hoffman-LaRoche, Switzerland  
Robert Balcarcel, Vanderbilt University, USA  
Takeshi Omasa, Osaka University, Japan

14:15               **EXCURSION: BUS LEAVES FOR TULUM AND XCARET Dinner**

For those not going on the excursion, dinner will be at the hotel

**Wednesday, March 10, 2004**

- 07:00 – 08:30 Breakfast (Market Place or Capri)
- 08:30 – 10:30 **SESSION 5: Process Development and Integration into Large-Scale Cell Culture**  
Session Chairs: Thomas Ryll, Tanox, USA  
Limin Qu, Protein Design Laboratories, USA
- 08:30 – 08:54 **The Integration of a Predictive Small-Scale Process Model into a Program Directed at Seamless Tech Transfer, Process Variability Reduction, and Long-Term Process Optimization**  
Jesse Bergevin, Genentech, USA
- 08:54 – 09:18 **Improving the Production Process for Enbrel® Post Approval**  
Carole Heath, Amgen Inc. USA.
- 09:18 – 09:42 **Challenges and Opportunities for High Density Perfusion Cultures**  
Sadettin S. Ozturk, Centocor Inc., USA.
- 09:42 – 10:06 **Process Transfer, Scale-Up, and Comparability for a Co-Developed Therapeutic Antibody**  
Robert Kiss, Abgenix, Inc.  
Carole Heath, Amgen, Inc. USA
- 10:06 – 10:30 **Myeloma Cells for Recombinant Human IgG4 Production - Influence of Metabolic Selectable Marker and Scale-Up Strategy**  
Ray Field, Cambridge Antibody Technology, UK
- 10:30 – 11:00 Coffee Break
- 11:00 – 12:30 **SESSION 6: Process Monitoring and Control**  
Session Chairs: Konstantin Konstantinov, Bayer Corporation, USA  
Jurgen Lehman, Bielefeld University, Germany
- 11:00 – 11:30 **Sensor-Based Robotics: Current State of Research, Deployment in Various Sectors of Industry and Potential for Service Robot Applications in Biotechnology**  
Alois Knoll, Technical University of Munich, Germany
- 11:30 – 11:50 **Monitoring Cell Concentration and Control of Cellular Environment in an Acoustic Filter for Perfusion Culture**  
James M. Piret, Volker M. Gorenflo, Joachim Ritter, Vincent Chow, Hans Drouin, Bruce D. Bowen, Department of Chemical and Biological Engineering, University of British Columbia, Canada

- 11:50 – 12:10      **Novel Optical Sensors for High Throughput Culture**  
Govind Rao, Yordan Kostov, Leah Tolosa, Xudong Ge, Peter Harms, Mita Das, University of Maryland-BC, USA
- 12:10 – 12:30      **Advancement of Process Monitoring/Control Technologies in High Cell Density Perfusion Culture - Total Automation**  
Chun Zhang, Konstantin Konstantinov, Klaus Joeris, Chetan Goudar, Cary Matanguihan, Rudiger Heidermann, John Thrift, Mark Burnett, Bayer Corporation, USA  
 Jürgen Lehman, Bielefeld University  
 Alois Knoll, Technical University of Munich, Germany  
 Thomas Scheper, University of Hannover, Germany
- 12:30 – 14:30      **POSTER SESSION II – With Grazing Lunch**  
 Poster Chairs:  
 Ilse Blumentals, Merck & Co., USA  
 Georg Schmid, Hoffman-LaRoche, Switzerland  
 Robert Balcarcel, Vanderbilt University, USA  
 Takeshi Omasa, Osaka University, Japan
- 14:30 – 16:45      *Ad hoc* sessions, relaxation, recreation
- 16:45 – 18:45      **WORKSHOPS II** (three simultaneous workshops)  
 General Workshop Coordinator: Dhinakar S. Kompala, University of Colorado  
**D. Non-pharmaceutical Applications of Animal Cell Culture**  
 Workshop Chairs: Steven Reid, University of Queensland, Australia  
 Mark Powers, Cambrex Bio Sciences, USA  
**E. The Advent of Biogenerics: Implications for the Cell Culture Field**  
 Workshop Chairs: Ana Maria Moro, Instituto Butantan, Brazil  
 Reed Harris, Genentech, USA  
 Invited Panelist: K.S.N. Prasad, Shanta Biotechniques Pvt, Ltd. India  
**F. New Strategies for Developing Cell Lines with High Specific Productivity and Good Process Performance**  
 Workshop Chairs: Noelle Sunstrom, Acyte Biotec Pty. Ltd., Australia  
 Mohamed Al-Rubeai, University of Birmingham, UK
- 18:45 - 19:15      Coffee Break
- 19:15 – 20:15      **SPECIAL MERCK AWARD 2002 KEYNOTE LECTURE**  
**Cell Culture Engineering- A Look to the Future**  
 Wei-Shou Hu  
 University of Minnesota
- 20:15                  Dine around through any of the six hotel restaurants

## Thursday, March 11, 2004

- 07:00 – 08:30 Breakfast (Market Place or Capri)
- 08:30 – 10:30 **SESSION 7: Viral Vectors for Gene Therapy and Vaccination**  
Session Chairs: William Miller, Northwestern University, USA  
Amine Kamen, Biotechnology Research Institute, Canada
- 08:30 – 09:15 **Gene Therapy: The Next Two Decades**  
Inder Verma, The Salk Institute, USA
- 09:15 – 09:50 **HIV-1 Assembly and Release**  
Eric O. Freed, HIV Drug Resistance Program, NCI-Frederick, USA
- 09:50 – 10:10 **Adaptation of the Wave Bioreactor to Baculoviral Production of AAV Vectors: Scale-Up Considerations**  
Haifeng Chen, Shangzhen Zhou, Glenn P. Pierce, Peter Colosi, Avigen Inc., USA
- 10:10 – 10:30 **Manufacturing of Adenovirus Type 2 Gene Therapy Vectors at the 30 L Scale**  
Jesse Keegan, Lois E.E. Horton, Donald R. Dineen, David McNeilly, Simon Godwin and Christopher K. Murphy, Genzyme Corporation, USA
- 10:30 – 11:00 Coffee Break
- 11:00 – 12:45 **SESSION 8: Microscale Tissue Engineering and Development of Biological Micro-electromechanical Systems**  
Session Chairs: William Bentley, University Maryland, USA  
Paul Gourley, Sandia National Laboratories, USA
- 11:00 – 11:15 **Overview of Biological Micro-Electromechanical Systems**  
Paul Gourley, Sandia National Laboratories, USA
- 11:15 – 11:45 **Biological Large Scale Integration**  
Stephen Quake, California Institute of Technology, USA
- 11:45 – 12:15 **Microdefining Cellular Habitats for Cell-based Analysis and Tissue Engineering**  
Tejal Desai, Boston University, USA
- 12:15 – 12:45 **“Animal-on-a-Chip”: Predictive Pharmacology Using Cell Culture and Microfabrication**  
Michael Shuler, Cornell University, USA

- 12:45 – 14:35      **POSTER SESSION II – *With Grazing Lunch***  
 Poster Chairs:  
 Ilse Blumentals, Merck & Co., USA  
 Georg Schmid, Hoffman-LaRoche, Switzerland  
 Robert Balcarcel, Vanderbilt University, USA  
 Takeshi Omasa, Osaka University, Japan
- 14:45 – 16:45      *Ad hoc* sessions/relaxation/recreation
- 16:45 – 18:45      **SESSION 9: Stem Cell and Tissue Engineering**  
 Session Chairs: James Piret, University of British Columbia, Canada  
 Anthony Ratcliffe, Synthasome, USA
- 16:45 – 17:18      **Stem Cells, Biomaterials, and Musculoskeletal Tissue Engineering**  
Jennifer H. Elisseeff, Myoung Soo Kim, Christopher Williams, Michael Shablott, and John Gearhart, Johns Hopkins U., USA
- 17:18 – 17:51      **Cell Therapy for Diabetes**  
 Fred Levine, University of California San Diego, Cancer Center, USA
- 17:51 – 18:24      **Stem Cell-Based Tissue Engineering: Cell Culture and Delivery Applications**  
 Frank Barry, Osiris, USA
- 18:24 – 18:45      **Cell Culture in 3-D**  
Lars Keld Nielsen, Nicholas Timmins, The University of Queensland, Australia
- 18:45 - 19:15      Coffee Break
- 19:15 – 20:15      **KEYNOTE**  
***Clinical Applications of Stem Cells (embryonic stem cells and central nervous system)***  
 Ronald McKay  
 National Institutes of Health, USA
- 20:15 – 22:00      Banquet at the Theater
- 22:00 – 23:00      Social Hour

## **Friday, March 12, 2004**

- 07:00 –08:30 Breakfast (Market Place or Capri)
- 08:30 – 10:30 **SESSION 10: New Technology in Expression Systems and Cell Line Development**  
Session Chairs: Daniel Allison, ICOS Corp., USA  
Richard Barnett, Biogen IDEC, USA
- 08:30 – 09:00 **Development of Efficient Transfection Microarray (TMA) and its Applications**  
Tomohiro Yoshikawa, Masato Miyake, Jun Miyake, TERC, AIST, Japan
- 09:00 – 09:30 **Episomal Expression System for Recombinant Protein Production in CHO Cells**  
Noelle-Ann Sunstrom, ACYTE Biotech, Australia  
Rajkumar Kunaparaju, Mimi Liao, University of New South Wales, Australia.
- 09:30 – 10:00 **Improved Sindbis Viral Expression Systems for Mammalian Cell Culture**  
Michael J. Betenbaugh, Toey Nivitchanyong, Yien Che Tsai, Johns Hopkins University, USA  
Paul S. Fishman, George A. Oyler, University of Maryland Medical Center. USA
- 10:00 – 10:30 **High-level Protein Production in CHO Cells Using a New Inducible Expression System: The Cumate Gene-Switch**  
Bernard Massie, Rénaud Gilbert, Alaka Mullick, Bruno Gaillet, Claire Guilbault, Mélanie Leclerc, Félix Malenfant, Penelope Harakidas  
Groupe de Vecteurs de Génomique et Thérapie Génique, Institut de Recherche en Biotechnologie, Conseil National de Recherches, Canada
- 10:30 - 11:00 Closing remarks  
  
Departures after lunch

**Post-conference excursion to Chichén Itza.** This activity is not directly organized by ECI. Please check the web page for reservations with the organizing travel agency.

## POSTER PRESENTATIONS SESSION I

### A. Postranslational Processing and Product Quality.

**P.I.A.1. COMPARISON OF PROTEOLYTIC ACTIVITY IN SF9 AND HIGH-5 CELLS - OPTIMISATION OF EXPRESSION USING PROTEASE INHIBITORS**

Gary Pettman and Joanna Holmes, GlaxoSmithKline, UK

**P.I.A.2. SECRETED PRODUCTION OF HUMAN GLYCOPROTEINS IN STABLY TRANSFORMED DROSOPHILA S2 CELLS AND ANALYSIS OF THEIR N-GLYCAN PATTERNS**

Hyung Joon Cha, Yeon Kyu Kim, Hye Jung Lim, and Dong Gyun Kang, Pohang University of Science and Technology, Korea

**P.I.A.3. PRODUCTION AND GLYCOSYLATION OF RECOMBINANT BETA-INTERFERON IN SUSPENSION AND CYTOPORE MICROCARRIER CULTURES OF CHO CELLS**

Maureen Spearman, Jose Rodriguez, Norm Huzel, and Michael Butler, University of Manitoba, Canada

**P.I.A.4. A SINGLE MONOCLONAL ANTIBODY AS PROBE TO DETECT THE ENTIRE SET OF NATIVE AND PARTIALLY UNFOLDED RHEPO GLYCOFORMS**

Marcos Oggero Eberhardt, Gabriel Amadeo, Maria Laura Zenclussen, Ricardo Kratje, and Marina Etcheverrigaray, Universidad Nacional del Litoral, Argentina

**P.I.A.5. EFFECT OF THE CONCENTRATION OF MANNOSAMINE, CYTIDINE AND N-ACETYL MANNOSAMINE ON THE GLYCOSYLATION OF HUMAN RECOMBINANT ALKALINE PHOSPHATASE PRODUCED IN INSECT CELLS**

Adrián Delgado-Bustos, Octavio T. Ramírez and Sandino Estrada-Mondaca, Instituto de Biotecnología, Universidad Nacional Autónoma de México, Mexico

**P.I.A.6. GLYCOSYLATION ANALYSIS OF EPO PRODUCED IN HOLLOW FIBER AND STIRRED TANK PERFUSION PROCESS**

Eduardo Ojito Magaz, Antonio Vallin, Lourdes Bouzo, Miguel A. Arias, and Ernesto Chico Veliz, Center of Molecular Immunology, Cuba

**P.I.A.7. A METHOD FOR INCREASING GLYCOPROTEIN SIALYLATION IN MAMMALIAN CELLS**

Brian D. Follstad, Amgen Corporation, USA

**P.I.A.8. PERFORMANCE OF A HYBRIDOMA CELL LINE GROWING IN COMMERCIAL SERUM-FREE MEDIA VS SERUM-SUPPLEMENTED MEDIUM: COMPARISON OF GROWTH AND GLYCOSYLATION PROFILE**

J. Antonio Serrato, Vanessa Hernández, Sandino Estrada-Mondaca, Laura A. Palomares, and Octavio T. Ramírez, Instituto de Biotecnología, Universidad Nacional Autónoma de México, México

**P.I.A.9. N-GLYCAN SITE VARIABILITY IN MAMMALIAN CELL CULTURES**

Michael J. Betenbaugh, Jullian Jones, Karthik Viswanathan, Sharon S. Krag, Johns Hopkins University, USA

Steve Gorfien, David Judd and Scott Jacobia, Gibco-Invitrogen Corporation, USA

**P.I.A.10. GLYCOSYLATION PATHWAYS IN INSECT CELLS**

Karthik Viswanathan, Noboru Tomiya, Johns Hopkins University, USA

Karen Palter, Temple University, USA

Y. C. Lee, Michael J. Betenbaugh, Johns Hopkins University, USA



**P.I.A.11. ADDITION OF BISECTING N-ACETYLGLUCOSAMINE RESIDUES TO MONOCLONAL ANTIBODIES IN VITRO BY RECOMBINANT N-ACETYLGLYCOSAMINYLTRANSFERASE III FOR ENHANCED BIOLOGICAL ACTIVITY**

Yuan Zhi Zheng, Jason Hodoniczky, and David C. James, University of Queensland, Australia

**P.I.A.12. STABILITY OF CELL CULTURE HARVEST FROM A RECOMBINANT CHO CELL LINE AT TWO DIFFERENT TEMPERATURES**

Elias Nelson Rodríguez, Yalina Ordaz Contreras, Mayté Pérez Caballero, Lázaro Martínez Leyva, and Noel Herrera Batista, Center for Genetic Engineering and Biotechnology, Cuba

**P.I.A.13. A RECOMBINANT CHO CELL BIOASSAY FOR RELEASE TESTING OF NESIRITIDE (NATRECOR®) IN THE US FOR TREATMENT OF ACUTE CONGESTIVE HEART FAILURE**

James A. Zanghi, Susan Silver, Anny Wong, Nick Gaspar, Bioanalytical Methods Development, Scios Inc., USA

## **B. Cell Physiology and Metabolism**

### **P.I.B.1. IS GLUTAMINE REALLY ONE OF THE MAIN ENERGY SOURCES OF MAMMALIAN CELLS?**

Yvonne Genzel, Max Planck Institute for Dynamics of Complex Technical Systems, Germany

Rüdiger Alt, University of Leipzig, IZKF, Molecular Medicin, Germany

Udo Reichl, Max Planck Institute for Dynamics of Complex Technical Systems, Germany

### **P.I.B.2. PRODUCTION INSTABILITY IN LONG TERM CULTURES OF CHO CELLS**

Dhinakar S. Kompala, Matthew L. Lipscomb, and Mark C. Mowry, University of Colorado, Boulder, USA

### **P.I.B.3. ISOLATION, PURIFICATION, CHARACTERIZATION AND CELL CULTURE BIOACTIVITY OF PROTEINS ISOLATED FROM LONOMIA OBLIQUA HEMOLYMPH**

Alvaro P.B. Soares, Cristina C. Peixoto, Luis Maranga, Ana V. Carvalhal, Manuel J. T. Carrondo, Instituto de Biologia Experimental e Tecnologica (IBET), Portugal

Rita M.Z Mendonça, Roberto H. P. Moraes, Dalva A. P. Mancini, Carlos A. Pereira, Ronaldo Z. Mendonça, Instituto Butantan, São Paulo, Brazil

### **P.I.B.4. QUANTITATIVE AND QUALITATIVE ANALYSIS OF THE PRODUCTION OF AGMNPV POLYHEDRA THROUGH SERIAL PASSAGING IN SF9 INSECT CELLS**

Carlos Augusto Pereira, V. Rodas, D.S. Medeiros, Ronaldo Z. Mendonça, Instituto Butantan, Brazil

F.H Marques, A. Tonso, Escola Politécnica, Brazil

L.A.S. Melo and C. Medugno, Embrapa-Meio Ambiente, Brazil

### **P.I.B.5. INVESTIGATION OF METABOLIC DECLINE IN MAMMALIAN-CELL-BASED BIOPHARMACEUTICAL PRODUCTION PROCESSES**

Robert Balcarcel, Vanderbilt University, USA

### **P.I.B.6 DEVELOPMENT OF A HIGH YIELDING CHEMICALLY DEFINED ANIMAL COMPONENT FREE CELL CULTURE MEDIUM FOR THE PRODUCTION OF RECOMBINANT HUMAN IgG4 USING NSO MYELOMA CELL LINES**

Matthew Osborne, Jonathan Dempsey, Christy Ritchie, Alison Ridley, and Ray Field, Cambridge Antibody Technology (CAT), UK

### **P.I.B.7. EXTENDING CELL VIABILITY BY PEPTIDES SUPPLEMENTED TO CULTURE MEDIA**

Frantisek Franek, Institute of Experimental Botany, Czech Republic

### **P.I.B.8. THE HAPPY MARRIAGE OF PEI AND WAVE IN LARGE-SCALE TRANSIENT TRANSFECTION**

Sabine Geisse, Thomas Cremer, Klaus Memmert and Mario Henke, Novartis Pharma Research, Switzerland

### **P.I.B.9. INSIGHTS INTO THE CENTRAL METABOLISM OF SPODOPTERA FRUGIPERDA (SF-9) AND TRICHOPLUSIA NI (HIGH-FIVE™) INSECT CELLS BY RADIOLABELLING STUDIES**

Cynthia B. Elias, Chouki Benslimane, Jalal Hawari, and Amine Kamen, Biotechnology Research Institute (NRC), Canada

### **P.I.B.10. SUCCESSFUL REPLACEMENT OF SERUM BY PLANT PROTEIN HYDROLYSATES IN CELL CULTURE MEDIA**

Samad Radjai, Quest International, Inc. USA

**P.I.B.11. KINETIC STUDIES OF MANY POLYHEDRA AND FEW POLYHEDRA HASNPV BACULOVIRUSES**

Marcia Regina da Silva Pedrini, Federal University of Rio Grande do Norte, Brazil

Steven Reid, Lars Keld Nielsen, Leslie C.L. Chan, Chemical Engineering Department, The University of Queensland, Australia

**P.I.B.12. A CALCIUM-DEPENDENT SERINE PROTEASE IDENTIFIED IN SPENT SF9 INSECT CELL CULTURE MEDIUM**

Eva Lindskog, Lena Häggström, Royal Institute of Technology, Sweden

**P.I.B.13. THE EFFECT OF MEDIA ADDITIVES AND DISSOLVED OXYGEN ON HUMAN BETA INTERFERON (H- $\beta$ -IFN) EXPRESSION AND PRODUCTION**

Jose Rodriguez, Maureen Spearman, Norm Huzel and Michael Butler, University of Manitoba, Canada

**P.I.B.14. PHENOTYPIC DRIFT IN RECOMBINANT CELL LINES: CONSEQUENCES FOR USE AS HOSTS FOR RECOMBINANT PROTEIN PRODUCTION**

Louise M Barnes, University of Manchester, UK

Nicola Moy, Catherine Bentley, GlaxoSmithKline, UK

Alan Dickson, University of Manchester, UK

**P.I.B.15. TWO NOVEL MEDIUM ADDITIVES FOR SERUM AND SERUM-FREE MEDIA**

Karlheinz Landauer, Lucia Strommer, Manuela Kainer, Guenter Waxenecker, and Hans Loibner, Igeneon, Immunotherapy of Cancer, Australia

**P.I.B.16. GLYCOLYTIC CONTROL OF APOPTOSIS IN MAMMALIAN CELL CULTURE**

Lindsey M. Clark, R. Robert Balcarcel, Vanderbilt University, USA

**P.I.B.17. APPLICATION OF METABOLIC FLUX ANALYSIS IN DEVELOPMENT OF KINETIC MODELS**

Rasmus Bjerre-Nielsen, Novo Nordisk A/S, Denmark

Charles L. Cooney, Massachusetts Institute of Technology, USA

John Villadsen, Technical University of Denmark

**P.I.B.18. PHYSIOLOGICAL EFFECTS (AND POTENTIAL INHIBITION) OF HYDRODYNAMIC FORCES ON ANIMAL CELLS**

Mike Mollet, The Ohio State University, USA

Nilou Arden, Johns Hopkins University, USA

Ruben Godoy, The Ohio State University, USA

Mike Betenbaugh, Johns Hopkins University, USA

Jeffrey J. Chalmers, The Ohio State University, USA

**P.I.B.19. THE EFFECT OF METHOTREXATE SELECTIVE PRESSURE ON PRODUCTIVITY AND PRODUCT QUALITY IN MICROCARRIER-BASED PERFUSION CHO CELL CULTURES**

Janani Swamy, Franqui Jimenez-Marrero, Melissa Steeves, Cordula Schwarz, and Christopher Hwang, Genzyme Corporation, USA

**P.I.B.20. MILK WHEY PROTEINS AS SUPPLEMENTS FOR INSECT CELL CULTURE**

Angela Maria Moraes, Fabiana R. X. Batista, Carlos A. Pereira, Ronaldo Z. Mendonça, Laboratory of Viral Immunology - Butantan Foundation Brazil

**P.I.B.21. TRICHOPLUSIA NI CELLS PRODUCE AN EXTRACELLULAR METALLOPROTEASE, WHICH INFLUENCES GROWTH IN SERUM FREE CULTURES**

Ulrika Eriksson, Royal Institute of Technology, Sweden  
Jenny Blomqvist, Elke Lüllau, AstraZeneca, Sweden  
Lena Häggström, Royal Institute of Technology, Sweden

**P.I.B.22. COMPARATIVE ANALYSIS OF CELL SPECIFIC RECOMBINANT MONOCLONAL ANTIBODY PRODUCTION BY STABLY TRANSFECTED CHO CELLS USING EITHER CHEMICAL OR PHYSICAL CONTROL OF CELL CYCLE PROGRESSION**

Catherine J. Brown, Douglas J. Gilbraith, Andrew S. Tait, Charlie Ahn, Amit Patel, Diane M. Dinnis, Scott H. Stanfield, The University of Queensland, Australia  
John R. Birch, Lonza group, Switzerland  
David C. James, The University of Queensland, Australia

**P.I.B.23. INVESTIGATING THE ROLE OF METABOLIC INTERMEDIATES IN CHO METABOLISM**

Todd Luman, Alice Chuck, Amgen Inc., USA

**P.I.B.24. CHARACTERIZING CELLULAR SIGNAL TRANSDUCTION NETWORKS**

Arthi Narayanan, Rosalyn Upson and Frank Chaplen, Oregon State University, USA

**P.I.B.25. CONDITIONED MEDIUM FACTORS IN PROTEIN-FREE NSO MYELOMA CELL CULTURES**

Erika Spens, Lena Häggström, Department of Biotechnology, KTH Royal Institute of Technology, Sweden

**P.I.B.26. THE EFFECTS OF CYCLODEXTRIN, FATTY ACIDS, CHOLESTEROL AND INSULIN ON PROCESS ROBUSTNESS FOR PER.C6™ CELLS GROWN IN SERUM-FREE MEDIUM**

Gargi Maheshwari, Eileen Higham, Carrie Giordano, Charles Goochee, Merck & Co. USA

## **C. Genomics, Proteomics and Cell Engineering**

### **P.I.C.1. INCREASED PRODUCTIVITY AND IMPROVED PRODUCT SIALYLATION IN CELLS TRANSFECTED WITH THE GLUTAMINE SYNTHETASE GENE**

Robert Boraston, Mohsan Khan, Martyn Shaw, Zillah Boraston, Lonza Biologics. United Kingdom

### **P.I.C.2. IDENTIFICATION OF TARGET GENES FOR CELL ENGINEERING VIA A METABOLIC MODEL**

Ziomara P. Gerdtzen, Marcela de Leon Gatti, Jongchan Lee, Prodromos Daoutidis, and Wei-Shou Hu, University of Minnesota, USA

### **P.I.C.3. LARGE SCALE GENE EXPRESSION ANALYSIS OF CHOLESTEROL DEPENDENCE IN NSO CELLS**

Gargi Seth, Wei-Shou Hu, University of Minnesota, USA

Robin J. Philp, Bioprocess Technology Center, A-Star, National University of Singapore

Puja Billis, Katherine Mcgrath, Marie Zhu, Mark Berge, Claudio Denoya, Kim Stutzman-Engwall, Bioprocess Research, Pfizer Inc., USA

### **P.I.C.4. BCL-2 OVER-EXPRESSION REDUCES APOPTOTIC DEATH RATE AND PROLONGS G1 PHASE IN CHEMOSTAT CULTURES OF NSO CELLS**

B.T. Tey, University of Putra, Malaysia

R. P. Singh and M. Al-Rubeai, Department of Chemical Engineering, University of Birmingham, UK

### **P.I.C.5. COMBINATION OF A METABOLIC ENGINEERING APPROACH WITH AN ENVIRONMENTAL CONTROL STRATEGY TO INCREASE THE CELLULAR PRODUCTIVITY OF HGM-CSF-PRODUCING CHO CELLS**

Mariela Bollati Fogolin, Roland Wagner, German Research Institute for Biotechnology, Germany

Marina Etcheverrigaray and Ricardo Kratje, Universidad Nacional del Litoral, Argentina

### **P.I.C.6. TRANSCRIPTIONAL ANALYSIS OF AUTOLOGOUS PLASMA EFFECTS ON EX VIVO EXPANDED HUMAN T-LYMPHOCYTES**

Dirk Windgassen, Christopher G. Ramsborg, Jonathan K. Fallon, Carlos J. Paredes, and E. Terry Papoutsakis, Northwestern University, USA

### **P.I.C.7. GENOME-SCALE RECONSTRUCTION OF THE *MUS MUSCULUS* METABOLIC NETWORK**

Lars Keld Nielsen, Kashif Sheikh, The University of Queensland, Australia

### **P.I.C.8. OVER-EXPRESSION OF A CHAPERONE PROTEIN INHIBITS APOPTOSIS AND ENHANCES RFVIII PRODUCTIVITY IN BHK-21 CELLS**

Adiba Ishaque, John Thrift, Yvette Tang, Sam Chan, John Murphy and Konstantin Konstantinov, Bayer Corporation, USA

### **P.I.C.9. GENOMIC AND PROTEOMIC TOOLS FOR THE DEVELOPMENT OF CELL CULTURE MEDIA**

Laurel M. Donahue, Daniel W. Allison, Kathryn A. Aboytes, Terrell K. Johnson, Heather N. Loke, Danny K. Fong, Stacy L. Leugers, Anne E. Dennett, Sigma-Aldrich, USA

**P.I.C.10. GENE DISCOVERY IN CHINESE HAMSTER OVARY CELLS BY EST SEQUENCING,  
MICROARRAY, AND A COMPARITIVE SEQUENCE DATABASE**

Katie F. Wlaschin, University of Minnesota

Anette Rink, University of Nevada, Reno, USA

Peter Morin Nissom, Miranda Yap, Bioprocessing Technology Centre, A\*STAR, Singapore

Wei-Shou Hu, University of Minnesota, Minneapolis, USA

## **D. Stem Cell and Tissue Engineering**

### **P.I.D.1. IMPROVED *EX VIVO* EXPANSION OF FUNCTIONAL CD34+ CELLS USING STEMLINE™ II HEMATOPOIETIC STEM CELL EXPANSION MEDIUM**

Daniel W. Allison, Stacy L. Leugers, Sigma-Aldrich, USA

Barry J. Pronold, Gary Van Zant, University of Kentucky, College of Medicine, Markey Cancer Center, USA

Jenny A. Harrington, Ian K. McNiece, Johns Hopkins University, Division of Hematologic Malignancies

Laurel M. Donahue, Sigma-Aldrich, USA

### **P.I.D.2. ALLOREACTIVE T-CELL DEPLETION: THE SOLUTION TO THE CHALLENGE OF BONE MARROW TRANSPLANTS?**

Jeff Chalmers, Sherif Farag, The Ohio State University

Maciej Zborowski, The Cleveland Clinic Foundation, USA

### **P.I.D.3. COUNTERACTING HYPOXIA-INDUCED APOPTOSIS IN BIOHYBRID ARTIFICIAL ORGANS**

Chong Yung, William E. Bentley, Timothy A. Barbari, University of Maryland at College Park, USA

### **P.I.D.4. EFFECT OF RETINOIC ACID ON PROLIFERATION AND NERVE GROWTH FACTOR GENE EXPRESSION OF CULTURED KERATINOCYTES**

Yong Kwon Lee, College of Life and Environmental Sciences, Korea University, Korea

Jin-Woo Lee, College of Medicine, Kyung Hee University, Korea

Bok-Hwan Chun and Nahmhyun Chung, College of Life and Environmental Sciences, Korea University, Korea

### **P.I.D.5. REACTOR EVALUATION FOR BIOARTIFICIAL LIVER SUPPORT SYSTEM -BAL CLEARANCE AND AHP ANALYSIS**

Takeshi Omasa, Masaya Kawase, Osaka University, Japan

Shin Enosawa, National Research Institute for Child Health and Development, Japan

### **P.I.D.6. TARGETS FOR ENGINEERING IMPROVED LIVER-SPECIFIC PHENOTYPE IN HEPATIC CELL LINES**

A.J. Dickson, S. Armitage, University of Manchester, UK

M. Dickins, GlaxoSmithKline, UK

L. Rosenbrier, C.L. Varley, University of Manchester, UK

### **P.I.D.7. HEMATOPOIETIC CELL INTERACTIONS WITH LIPID-LINKED PEPTIDES IN HYBRID BILAYER MEMBRANES**

Shara M. Dellatore, Tor W. Jensen, Bi-Huang Hu, Phillip B. Messersmith, William M. Miller, Northwestern University, USA

### **P.I.D.8. A CELL CULTURE MODEL FOR THE EVALUATION OF RENAL FUNCTION**

Mark J. Powers, Sorin Damian, Cambrex Bio Science, USA

### **P.I.D.9. SINGLE-CELL MEASUREMENTS OF KINASE ACTIVITY IN PRIMARY HEMATOPOIETIC CELLS**

Julie Audet, University of Toronto, Canada

Joseph S. Soughayer, Christopher E. Sims, S. Tiong Ong, and Nancy L. Allbritton, University of California, Irvine, USA

**P.I.D.10. IN-VITRO EXPANSION OF CHONDROPROGENITOR CELLS FROM THE SUPERFICIAL ZONE OF THE ARTICULAR CARTILAGE**

Mohamed Al-Rubeai, Juan M. Melero Martin, University of Birmingham, UK  
Debby Heath, Smith & Nephew Research Centre, UK



## **E. Process Monitoring and Control**

### **P.I.E.1. AUTOMATIC 24/7 MONITORING OF CELL CULTURE BEHAVIOUR IN PILOT SCALE CULTIVATIONS OF MAMMALIAN CELLS USING AN AUTONOMOUS SERVICE ROBOT**

Iris Poggendorf, Dirk Lütkemeyer, Institute of Cell Culture Technology, University of Bielefeld  
Torsten Scherer and Alois Knoll, Institute of Robotics and Embedded Systems, Technical University of Munich  
Jürgen Lehmann, Institute of Cell Culture Technology, University of Bielefeld, Germany

### **P.I.E.2. USE OF TEMPERATURE MODULATION FOR PROCESS CONTROL OF LONG-TERM MICROCARRIER CULTURES**

Claudia W. Buser, Janani Swamy and Christopher Hwang, Genzyme Corporation USA

### **P.I.E.3. CONTROL OF TEMPERATURE AND pH ENHANCES HUMAN MONOCLONAL ANTIBODY PRODUCTION IN CHO CELL CULTURE**

Satoshi Oguchi, Hiroyuki Saito, Masayoshi Tsukahara, and Haruhiko Tsumura, Pharmaceutical Division, Kirin Brewery Co., Ltd., Japan

### **P.I.E.4. OVERNIGHT QUANTIFICATION OF BACULOVIRUS STOCK**

Chao-Min Liu, Li-Na Hong, Hoffmann-La Roche Inc., USA

### **P.I.E.5. CONTROLLED PROLIFERATION STRATEGY IN CHO CELLS: EFFECT OF TEMPERATURE REDUCTION ON HGM-CSF PRODUCTIVITY AND PRODUCT QUALITY**

Guillermina Forno, Laboratorio de Cultivos Celulares, Facultad de Bioquímica y Ciencias Biológicas, Universidad Nacional del Litoral, Argentina  
Mariela Bollati Fogolín, Harald S. Conradt, Manfred Nimtz, German Research Centre for Biotechnology (GBF), Germany  
Marina Etcheverrigaray, Ricardo Kratje, Universidad Nacional del Litoral, Argentina

### **P.I.E.6. ON-LINE MEASUREMENT OF VIABLE CELL DENSITY IN ANIMAL CELL CULTURE PROCESSES**

Georg Schmid, Sven Ansorge and Dorthe Zacher, F. Hoffmann-LaRoche Ltd., Switzerland

### **P.I.E.7. TWO CIRCUITS OR ONE? SHOULD O<sub>2</sub> ADDITION AND CO<sub>2</sub> REMOVAL BE UNCOUPLED**

Weiwei Hu, Mike Mollet, Jim Rathman, Jeff Chalmers, The Ohio State University, USA

### **P.I.E.8. STUDIES IN QUANTIFICATION OF ANTIBODY IN HOLLOW-FIBER BIOREACTOR HARVEST POOLS**

Jennifer Jois, Veronika Wirth, Anna Kypridis, and Roger Murphy, Ludwig Institute for Cancer Research, Australia

### **P.I.E.9. EVALUATION AND IMPLEMENTATION OF AN AUTOMATED CELL COUNTING DEVICE FOR MAMMALIAN CELL CULTURE**

Suzanne Kuo, Thomas Stapp, Polina Rapoport, Arlis Corbett, Kate Bishop, Martin Gawlitzek, Jesse Bergevin, Ron Taticek, Genentech, Inc., USA

### **P.I.E.10. A SCALABLE BIOPROCESS FOR GENERATING ES CELL-DERIVED CARDIOMYOCYTES**

Celine Bauwens, Ting Yin, Stephen Dang, and Peter Zandstra, University of Toronto, Canada

**P.I.E.11. USE OF ON-LINE OUR MEASUREMENTS TO MONITOR INSECT CELL CONCENTRATION, ACTIVITY AND VIRAL INFECTION PROGRESS IN BIOREACTOR CULTURES**

Francesc Godia, M. Lecina, A. Soley, J. de Gràcia, J.J. Cairó, Universitat Autònoma de Barcelona, Spain;  
E. Espuña, INGENASA, Spain  
C. Vela, HIPRA, Spain

**P.I.E.12. SIMULTANEOUS MEASUREMENTS OF OXYGEN AND CO<sub>2</sub> MASS TRANSFER COEFFICIENTS**

Sadettin S. Ozturk, J. Horwitz, D. Jan, R. Monsell, and G. Moore, Centocor, Inc.

**P.I.E.13. ON-LINE MONITORING OF PER.C6 SUSPENSION CULTURES FOR THE PRODUCTION OF ADENOVIRUS: COMPARISON OF TURBIDITY AND CAPACITANCE MEASUREMENTS**

Ilse J. Blumentals, James Warren, Rosario Scott, Jose Manuel Otero, Merck Research Laboratories, USA

## POSTER PRESENTATIONS SESSION II

### F. Process Development and Integration/Scale-up and Scale-down

#### **P.II.F.1. PRODUCTION OF PASSIVE IMMUNOTHERPEUTICS AGAINST BONT ANTIGEN**

Anu Subramanian, Mark Mowry, Ananth Parampalli and Michael Meagher, University of Nebraska, Lincoln, USA

#### **P.II.F.2. FROM GENE TO PROTEIN: A STREAM-LINED, MULTI-PARALLEL, SEMI-AUTOMATED PROCESS FOR BACULOVIRUS-DERIVED RECOMBINANT PROTEIN PRODUCTION**

Sabine Geisse, Marion Mahnke, Klaus Memmert, Jean-Marc Schlaeppli, and Rita Schmitz, Novartis Pharma Research, Switzerland

#### **P.II.F.3. NEW PROCESS DEVELOPMENT AND SCALE UP TECHNIQUES FOR HOLLOW FIBER BIOREACTOR OPTIMIZATION**

Michael J. Gramer, BioVest International, USA

#### **P.II.F.4. USE OF A MINIATURE BIOREACTOR AS A SCALE-UP TOOL FOR MAMMALIAN CELL CULTURE**

Wellae Williams-Dalson, Hu Zhang, Sally Lamping, University College London, UK  
Karen Hansen, Novo Nordisk  
Frank Baganz, University College London, UK

#### **P.II.F.5. ADVANCES IN MEDIA OPTIMIZATION: TWO AUTOMATED APPROACHES THAT INCREASE EXPRESSION WHILE REDUCING DEVELOPMENT TIME**

Stacy Holdread, Cindy Hunt, Toyin Oshunwusi, Jim Short, and James Brooks, BD Diagnostic Systems, USA

#### **P.II.F.6. MONOCLONAL ANTIBODY PRODUCTION: DETERMINATION OF APPROPRIATE SYSTEM AND MEDIA FOR PRODUCTION ENHANCEMENT AND DECREASE OF OVERALL PRODUCTION TIME**

Kathie S. Frichman, Becton Dickinson, USA  
Chakib Tilsaghani, BD Pharmingen  
Kurt Harbordt, BDDS, USA

#### **P.II.F.7. ANALYSIS OF MANUFACTURING DATA FOR PROCESS TROUBLESHOOTING, VARIABILITY REDUCTION, AND PROCESS OPTIMIZATION**

Oliver Yu, Genentech, Inc., USA

#### **P.II.F.8. THE EFFECT OF PERFUSION RATE ON CELL GROWTH AND THE PRODUCTION RATE OF A HYBRIDOMA CELL CULTURE PRODUCING MONOCLONAL ANTIBODY IN A CERAMIC MEMBRANE BIOREACTOR**

Jean-Francois Hamel, Ryo Ohashi, Massachusetts Institute of Technology, USA

#### **P.II.F.9. A TWO-COMPARTMENT SCALE-DOWN SYSTEM FOR SIMULATING DISSOLVED OXYGEN GRADIENTS IN ANIMAL CELL CULTURES**

Argel Gastélum, Octavio T. Ramírez and Laura A. Palomares, Instituto de Biotecnología, Universidad Nacional Autónoma de México, Mexico

#### **P.II.F.10. PUSHING THE CELL MASS LIMITS FOR FED-BATCH CELL CULTURE WITH NSO CELLS**

Feng Li, Edmund Kao, Cynthia Peacock, Kajijo Guya, and Thomas Ryll, Tanox, Inc., USA

**P.II.F.11. EPO AS A POTENTIAL BIOGENERIC: A CASE STUDY OF EQUIVALENCE BETWEEN HOLLOW FIBER AND STIRRED TANK BASED PROCESSES.**

Miguel Arias, Eduardo Ojito, Lourdes Bouzo, Antonio Vallin, and Ernesto Chico, Center of Molecular Immunology, Cuba

**P.II.F.12. A FED BATCH STRATEGY FOR ANTI-TNP MONOCLONAL ANTIBODY PRODUCTION BASED ON GLUCOSE LIMITATION**

Elisabeth de Fatima Pires Augusto, Chang Youn Lee and Thomaz de Gouveia, IPT – Institute for Technical Research, Brazil

Wirla Maria S.C. Tamashiro, IB-Instituto de Biologia da Unicamp – LIIC, Brazil

**P.II.F.13. SIMULATING THE DYNAMICS OF NUTRIENTS AND PROTEINS IN A CYCLING HOLLOW FIBER FERMENTER**

Ernesto Chico, Eduardo Ojito, Reynaldo Cuervo, Meylen Chea, and Grisel Rodriguez, Center of Molecular Immunology, Cuba

**P.II.F.14. PROCESS DEVELOPMENT AND SUPPLEMENT FEEDS TO INCREASE YIELDS FROM CHO CELLS USING PROTEIN-FREE CHEMICALLY DEFINED CELL CULTURE MEDIUM**

Joseph Camire, Paula Decaria, Bill Barnett, HyClone, Inc. USA

**P.II.F.15. SCALE-UP OF BIOPESTICIDE PRODUCTION USING INSECT CELL CULTURES**

Leslie C.L. Chan, Gary Butterworth, Duncan Smith, and Steve Reid, The University of Queensland, Australia

**P.II.F.16. EVALUATION OF RECOMBINANT INSULIN IN THE CULTIVATION OF CHO CELL LINE**

Elias Nelson Rodríguez, Yalina Ordaz Contreras, Mayté Pérez Caballero, Lázaro Martínez Leyva, and Noel Herrera Batista, Center for Genetic Engineering and Biotechnology, Cuba

**P.II.F.17. CARBON DIOXIDE IN PRODUCTION-SCALE FED-BATCH CHO CELL CULTURE AND ITS IMPACT ON PRODUCTIVITY OF A THERAPEUTIC PROTEIN**

Marie M. Zhu, Asti Goyal, Steven S. Lee, Bristol-Myers Squibb Company, USA

**P.II.F.18. PROCESS DEVELOPMENT FOR A RECOMBINANT CHINESE HAMSTER OVARY (CHO) CELL CULTURE WITH A METALLOTHIONEIN EXPRESSION SYSTEM**

Edwin P. Huang, Christopher P. Marquis and Peter P. Gray, The University of New South Wales, Australia

**P.II.F.19. APPLICATION OF A 2-L SCALE-DOWN MODEL TO CELL AGE CHARACTERIZATION STUDIES**

Wendy Chaderjian, Genentech, Inc., USA

**P.II.F.20. CASE STUDY: PROCESS CHARACTERIZATION OF A RECOMBINANT PROTEIN PROCESS**

Neil Kitchen, Anne Potter, Matthew Leith, Amy Guo, and Carole Heath, Amgen USA

**P.II.F.21. DESIGN AND START-UP DESIGN OF GENENTECH'S R&D CELL CULTURE & FERMENTATION PILOT PLANT**

Steven Meier, Sid Haskell, Richard Reineke, Tony Green, and Wayne Stribling, Genentech, USA

**P.II.F.22. DEVELOPMENT OF A LARGE-SCALE CELL BANK FOR THE PRODUCTION OF BIOLOGICS**

Ashraf Amanullah, Eric Burden, Maria Jug-Dujakovic, Mark M. Mikola, Christy Pearre and Wayne Herber, Merck & Co., USA

**P.II.F.23. APPLICATIONS OF STATISTICAL PROCESS CONTROL TO ESTABLISHING THE ROBUSTNESS OF A HIGH-PRODUCTIVITY CHO-BASED CELL CULTURE PLATFORM**

Eric Fallon, Roger DeWames, Alan Sonnenfeld, Christopher Bork, David Y.H. Chang, Biogen IDEC, Inc., USA

**P.II.F.24. BIOREACTORS COMPARISON FOR EPO PRODUCTION**

Ana Maria Moro, Angélica Garbuio, Maria Teresa Alves Rodrigues, Roselaine Campos Targino, Insituto Butantan, Brazil

Aldo Tonso, Depto. Engenharia Química, Universidade de São Paulo, Brazil

**P.II.F.25. DEVELOPMENT OF HIGH YIELDING, CHEMICALLY DEFINED, PROTEIN-FREE AND ANIMAL COMPONENT-FREE PROCESSES FOR BIOPHARMACEUTICAL MANUFACTURING FROM MAMMALIAN CELL LINES**

Martyn Shaw, David Mainwaring, Tracy S. Root, Emma E. Allen, Lonza Biologics, United Kingdom

**P.II.F.26. HIGH CELL DENSITY PERFUSION CULTURES USING A DEPTH FILTER PERFUSION SYSTEM APPLIED FOR PRODUCTION OF RECOMBINANT MONOCLONAL ANTIBODIES FROM CHO CELLS AND ADENOVIRUS VECTORS FROM HEK293 CELLS**

Duk Jae Oh, Sejong University

Joon Chul Lee, KAIST

Hyun Joong Hwang, Sejong University

Ho Nam Chang, KAIST, Korea

**P.II.F.27. DEVELOPMENT OF FED BATCH CULTURES: OPTIMIZING MEDIUM, CELL LINES, AND BIOREACTOR OPERATIONS BASED ON DENSITY AND PRODUCTIVITY**

Shawn Lawrence, Michelle LaFond, Christopher Hartnett, Scott Carver, Kevin Bailey. Regeneron Pharmaceuticals, USA

**P.II.F.28. DEVELOPMENT OF INCLINED PLATE SETTLER FOR HIGH DENSITY PERFUSION CULTURES**

Sadettin S. Ozturk, J. Horwitz, C. Koay, A. Fayette, J. Lekinski, T. Merkel, M. Hansford, R. Monsell, G. Moore, Centocor, Inc. USA

Peter Brown, Biotechnology Solutions, USA

**P.II.F.29. PROCESS DEVELOPMENT AND SCALE-UP OF CETUXIMAB PRODUCTION PROCESS**

Girish J. Pendse, Katarzyna Case, Lori DelMauro, Michael Prentice, Maya Grosh, Elizabeth Piotrowski, Jose Santiago, Diane Blumenthal, Richard Crowley, Qinwei Zhou, Joseph Tarnowski, Daniel Velez

ImClone Systems Incorporated, USA

**P.II.F.30. PROCESS OPTIMISATION OF THE HUMAN CELL LINE PER.C6 FOR THE PRODUCTION OF BIOPHARMACEUTICALS**

John Crowley, Maike Wübben, Edith Olthof, Jose M.Coco Martin, DSM Biologics

## **G. Viral Vectors for Gene Therapy and Vaccination**

### **P.II.G.1. CONCEPTS FOR VACCINE PRODUCTION: MATHEMATICAL MODELING OF CELL GROWTH AND INFLUENZA VIRUS REPLICATION**

Prof. Udo Reichl, Dr. Yvonne Genzel, Max Planck Institute for Dynamics of Complex Technical Systems  
Lars Möhler, Otto-von-Guericke University  
Iouri Sydorenko and Heiner Sann, Max Planck Institute for Dynamics of Complex Technical Systems, Germany

### **P.II.G.2. DIFFERENCES IN THE PRODUCTION OF RETROVIRUS TRANSGENE VECTOR AND REPLICATION-COMPETENT RETROVIRUS IN PA317 CELLS: A STUDY OF MICROCARRIER CULTIVATION AND MEDIUM EXCHANGE PROCEDURE**

Suh-Chin (Samuel) Wu, Weili Hung, National Tsing Hua University, Taiwan  
Jin-Hwang Liu, Division of Medical Oncology, Veterans General Hospital-Taipei, Taiwan

### **P.II.G.3. EVALUATION OF PRODUCTION CELL LINE FOR THE VACCINIA VIRUS EXPRESSION SYSTEM**

Joseph Shiloach, National Institutes of Health, NIDDK, USA  
W.E. Bentley, University of Maryland College Park, USA  
N. A. Bleckwenn, National Institutes of Health, NIDDK, USA

### **P.II.G.4. CHOLESTEROL SUPPLEMENTATION INCREASES THE PRODUCTION OF RETROVIRAL AND LENTIVIRAL VECTORS PSEUDOTYPED WITH THE VESICULAR STOMATITIS VIRUS GLYCOPROTEIN (VSV-G)**

Yong Chen, Ashok Aiyar, Northwestern University, USA  
Pappasani Subbaiah, Rush University, USA  
William M. Miller, Northwestern University, USA

### **P.II.G.5. PRODUCTION OF ADENOVIRAL VECTORS FOR GENE THERAPY IN SUSPENSION CULTURE - UPSTREAM PROCESS CHARACTERIZATION**

Erik M. Whiteley, Laura Lange, John Garbutt, Gary Schoofs, and Tom Monica, Berlex Biosciences, USA

### **P.II.G.6. SCALABLE PROCESSES FOR RECOMBINANT AAV MANUFACTURING**

Barbara Thorne, Targeted Genetics Corporation, USA

### **P.II.G.7. PRODUCTION OF ADENO-ASSOCIATED VIRUS BY BACULOVIRUS/INSECT CELLS SYSTEM IN SUSPENSION CULTURES**

Amine Kamen, Jamal Meghrou, Danielle Jacob, Parminder Chahal, Normand Arcand, Marc G. Aucoin  
Biotechnology Research Institute, National Research Council, Canada

### **P.II.G.8. EFFECT OF BCG ON ANTIBODY AND CYTOKINE PRODUCTION**

Vera L. Petricevich, Faculty of Medicine, UAEM, Mexico;  
Wilmar Dias da Silva, Biologia do Reconhecer UENF, Brazil

### **P.II.G.9. THE USE OF PACKAGING CELL LINES FOR THE PRODUCTION OF AAV-VECTORS. AN OPTIMISATION STUDY.**

Merten, O.-W., Jenny C. Gény-Fiamma, Genethon, France  
V. Blouin, P. Moullier, INSERM ERM, France  
O. Danos, Généthon, France  
A. Salvetti, INSERM ERM, France

**P.II.G.10. PRODUCTION OF ROTAVIRUS-LIKE PARTICLES USING A MULTIGENE BACULOVIRUS-INSECT CELLS EXPRESSION SYSTEM**

Filipa P. Mendes, Cristina Peixoto, Marcos F. Q. Sousa, Paula M. Alves, IBET, Portugal  
Manuel J. T. Carrondo, IBET/ITQB and FCT/UNL, Portugal

**P.II.G.11. OPTIMISED REFEEDING STRATEGIES FOR ADENOVIRUS PRODUCTION AT HIGH CELL DENSITIES**

Tiago B. Ferreira, Ana L. Ferreira, Paula M. Alves, IBET/ITQB, Portugal  
M. J. T. Carrondo, IBET/ITQB and FCT/UN, Portugal

**P.II.G.12. ACOUSTICALLY ENHANCED VIRAL TRANSFECTION**

Volker M. Gorenflo, Pascal Beauchesne, Connie J. Eaves, Bruce D. Bowen, and James M. Piret, University of British Columbia, Canada

**P.II.G.13. CELL LINE AND CELL CULTURE MODIFICATIONS FOR COMMERCIALIZATION OF A HUMAN GLYCOPROTEIN VACCINE**

Sridhar Reddy, Christiane Koehne, Vaxgen, Inc., USA

**P.II.G.14. TOWARDS THE EFFICIENT AND RATIONAL PRODUCTION OF VIRUS-LIKE PARTICLES IN INSECT CELLS**

Jimmy A. Mena, Octavio T. Ramírez and Laura A. Palomares, Instituto de Biotecnología. Universidad Nacional Autónoma de México, Mexico

**P.II.G.15. PRODUCTION, OPTIMIZATION AND PURIFICATION OF FIRST AND THIRD GENERATION ADENOVIRUS VECTORS FOR GENE THERAPY**

B.A. Andrews, E. Olivares, F. Zuñiga, Y. Israel, and J.A. Asenjo, University of Chile, Chile

**P.II.G.16. DEVELOPMENT OF A HIGH CELL DENSITY PROCESS FOR THE PRODUCTION OF RETROVIRAL VECTORS BY 293GPG CELLS**

Karim Ghani, Laval University and National Research Council, Canada  
Alain Garnier, Laval University, Canada  
Helene Coelho, Pierre Trudel, and Amine Kamen, National Research Council, Canada

**P.II.G.17. A NOVEL SCALEABLE APPROACH FOR RETROVIRUS VECTOR PURIFICATION**

Maria de las Mercedes Segura, Laval University and National Research Council, Canada  
Amine Kamen, National Research Council, Canada  
Pierre Trudel, Laval University and National Research Council, Canada  
Julia Transfiguracion, National Research Council, Canada  
Alain Garnier, Laval University, Canada

**P.II.G.18. DESIGNING ADENOVIRUS FOR ENHANCED TRANSGENE EXPRESSION: APPLICATION IN CANCER GENE THERAPY WITH A SUICIDE GENE**

Bernard Massie, Denis Boubreau, Geneviève Lavoie, Sophie Adjalley, Inst. Rech. Biotech. CNRC, Canada

**P.II.G.19. DEVELOPING A PRODUCTION PROCESS FOR A LIVE, ATTENUATED CHIMERIC VIRUS VACCINE CANDIDATE**

Inn H. Yuk, Gina Brower, Ajit Subramanian, Richard Schwartz, Eric Tsao, J. Michael Berry, MedImmune Vaccines, Inc., USA

## **H. Expression Systems and Cell Line Development**

### **P.II.H.1. NON-VIRAL TRANSIENT GENE EXPRESSION AT SCALES FROM MILLILITERS TO 100 LITERS**

Florian Maria Wurm, Swiss Federal Institute of Technology Lausanne, Switzerland

### **P.II.H.2. OPTIMIZATION OF THE CULTURE OF NEURONAL CELL LINES FOR THE DEVELOPMENT OF CELL TRANSPLANT MATERIAL**

J.A. Asenjo, L. Sörvik, M.C. Castillo, D. Sepúlveda, R. Caviedes, P. Caviedes and B.A. Andrews, University of Chile, Chile

### **P.II.H.3. EVALUATION OF MULTIGENE EXPRESSION VECTORS**

Michele Underhill, University of Kent, U

John Birch, Lonza Biologics plc, UK

Louise Naylor, University of Kent

David James, University of Queensland, Australia

C. Mark Smales, University of Kent, UK

### **P.II.H.4. OPTIMISING TRANSLATION OF PROTEINS IN CHO CELLS THROUGH CODON MODIFICATION**

Ian Frazer, Coridon Pty Ltd., Australia

Liz Tomlinson, The University of Queensland, Australia

### **P.II.H.5. OPTIMIZED STRATEGIES FOR PRIMARY BRAIN CELL CULTURING IN STIRRED TANK BIOREACTORS**

Paula M. Alves, Sónia Sá Santos, IBET/ITQB, Portugal

Luís L. Fonseca, ITQB, Portugal

Miguel A.R. Monteiro, IBET/ITQB, Portugal

Manuel J.T. Carrondo, IBET/ITQB and FCT/UNL, Portugal

### **P.II.H.6. EFFICIENT ISOLATION OF PRODUCTION CELL LINES BASED ON SECRETION LEVELS**

James P. Fandl, Gang Chen, Neil Stahl, and George Yancopoulos, Regenron Pharmaceuticals, Inc., USA

### **P.II.H.7. DEVELOPMENT OF A SEMI-AUTOMATED SYSTEM FOR SINGLE COLONY IDENTIFICATION IN 96 WELL PLATES USING A ZEISS AXIOVERT 200 MOTORIZED INVERTED MICROSCOPE.**

Ray Davis, Amgen, USA

Tim Murphy, Zeiss, USA

Stefan Ponko, Joel Parrelli, and Pranhitha Reddy, Amgen, USA

### **P.II.H.8. ACCELERATING CELL LINE DEVELOPMENT BY STARTING FROM EXISTING HIGH-PRODUCING CELL LINES**

Taymar Hartman, Nalin Sar, Kimberly Duncan, Diana Barritt, and Paul Sauer, Protein Design Labs, Inc. USA

### **P.II.H.9 ACTIVATION OF THE CUMATE-INDUCIBLE PROMOTER RESULTS IN EXCEPTIONALLY HIGH LEVEL EXPRESSION IN COMPARISON TO WIDELY-USED TETRACYCLINE-INDUCIBLE SYSTEM**

Bernard Massie, Alaka Mullick, Claire Guilbault, and Penny Harrakides, Institut de Recherche en Biotechnologie, Conseil National de Recherches Canada

Amélie Pilotte, Département de Biologie Moléculaire, Université de Montréal



**P.II.H.10. TRANSIENT PRODUCTION OF RECOMBINANT PROTEINS BY CHINESE HAMSTER OVARY CELLS USING POLYETHYLENEIMINE/DNA COMPLEXES IN COMBINATION WITH MICROTUBULE DISRUPTING ANTI-MITOTIC AGENTS**

Andrew S. Tait, University College London, UK

Catherine J. Brown, Michael J. Hines, Douglas J. Galbraith, University of Queensland, Australia

Mike Hoare, University College London, UK

John Birch, Lonza Group, Switzerland

David C. James, University of Queensland, Australia

**P.II.H.11. OPTIMIZATION OF LARGE-SCALE TRANSIENT TRANSFECTION OF HEK293/EBNA1 CELLS FOR THE PRODUCTION OF SECRETED, CYTOSOLIC AND MEMBRANE R-PROTEINS.**

Yves Durocher, National Research Council, Canada

**P.II.H.12. EFFECTS OF MEDIUM SUPPLEMENTS ON TRANSIENT GENE EXPRESSION**

Elke Lüllau, Sebastian Baumann, AstraZeneca, Sweden

Elco Docter and Ian Hampton, AstraZeneca, UK

**P.II.H.13. A METHOD FOR RAPIDLY GENERATE HIGHLY PRODUCTIVE STABLE CLONES WITH DIRECT METHOTREXATE SELECTION IN CHO CELLS**

Amy Shen, John Joly, Kim Leach, Stefanie Weikert, Donna Hinkins, Wendy Chaderjian, Ben Pelletier and Lynne Krummen, Genentech, Inc., USA

**P.II.H.14. SELECTION AND ENRICHMENT OF HIGH-PRODUCING, GS CELL LINES USING FLOW CYTOMETRY AND CELL SORTING**

Perani A., Metcalfe, H., Khan, P., Turner, S., Regmi, KC S, and Morris, H., Lonza, UK

**P.II.H.15. COMPARISON OF GS/CHOK1-SV AND DHFR/CHO-DG44 EXPRESSION SYSTEMS FOR DEVELOPMENT OF HIGH EXPRESSION CELL LINES OF MONOCLONAL ANTIBODIES**

Chanyong Lee, Krista Alvin, Lily Chu, Celina Edmonds, and David Robinson, Merck & Co., USA

**P.II.H.16. EXTENSIVE USE OF SP2/0 CELLS AS A VERSATILE TOOL TO PRODUCE MONOCLONAL ANTIBODIES FOR MARKET AND CLINICAL TRIALS**

Burkhard Wilms, Novartis Pharma AG, Switzerland

**P.II.H.17. APPROACHES AND CHALLENGES IN SERUM-FREE SINGLE CELL SUBCLONING**

Bob Valamehr, Lynette Buck, Selam Ogbagabriel and Thomas Seewoester, Amgen Inc. USA

**P.II.H.18. SELECTION AND CHARACTERIZATION OF RECOMBINANT CELL LINES WITH IMPROVED PHENOTYPES**

Adolfo José Castillo, Kathya R. de Luz Hernández, and Svieta Víctores, Center of Molecular Immunology, Cuba

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### **P.II.I.1. RAPID RECOMBINANT PROTEIN PRODUCTION BY PEI-MEDIATED TRANSIENT TRANSFECTION OF CHO CELLS IN BATCH CULTURE**

Catherine J. Brown, University of Queensland, Australia  
Andrew S. Tait and Mike Hoare, University College London, UK  
John Birch, Lonza Biologics, UK  
David C. James, University of Queensland, Australia

### **P.II.I.2. RC-SELDI-MS: A RAPID APPROACH TO THE OPTIMIZATION AND ANALYSIS OF PROTEIN EXPRESSION**

James Spencer, Tom Bronzert, and Lisa Bradbury, CIPHERGEN BioSystems, USA

### **P.II.I.3. APPLICATION OF HIGH THROUGHPUT EXPRESSION SCREENING**

Rohini Deshpande, Amgen, Inc., USA

### **P.II.I.4. AN INTEGRATED ANALYTICAL PLATFORM FOR RAPID MOLECULAR CHARACTERIZATION OF RECOMBINANT MONOCLONAL ANTIBODIES**

Mark J Bailey, University of Queensland, Australia  
Andrew Hooker, Pfizer Central Research, UK  
David C James, University of Queensland, Australia

### **P.II.I.5. A MICROFLUIDIC CELL CULTURE DEVICE FOR PROCESS DEVELOPMENT**

H. Brett Schreyer, Andrey J. Zarur, BioProcessors Corp., USA

### **P.II.I.6. UTILIZATION OF DASGIP MINI BIOREACTOR SYSTEM AS A TOOL FOR CELL LINE EVALUATION AND SELECTION**

Sadettin S. Ozturk, K. Knowles, R. Monsell, Centocor, Inc., USA

### **P.II.I.7. ISOLATION AND CLONING OF MAMMALIAN CELLS SUBPOPULATIONS**

Amihay Freeman, Ramat Aviv, Marina Volpe, Tel Aviv University, Israel  
Shaul Reuveny, Israel Institute for Biological Research, Israel