

FINAL PROGRAM

PREP 2009

► CHAIRED BY
Prof. Giorgio Carta
University of Virginia

Dr. Olivier Dapremont
Ampac Fine Chemicals

Prof. Georges Guiochon
*University of Tennessee &
Oak Ridge National Lab*

► SYMPOSIUM/EXHIBIT MANAGER
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LOEWS PHILADELPHIA HOTEL • JULY 19 - 22, 2009



www.PREPSYMPIOSIUM.org

22nd International Symposium,
Exhibit and Workshops on
Preparative / Process Chromatography

WELCOME TO PREP 2009

On behalf of the Organizing Committee, we welcome you to Philadelphia and PREP 2009, the 22nd International Symposium, Exhibit & Workshops on Preparative and Process Chromatography.

Chromatography continues to play a critical role in chemical and biochemical manufacturing from the gram scale to the multiple ton scale and we expect that its importance will continue to grow as the technology continues to improve and the range of applications continues to expand. PREP 2009 brings you a rich scientific program with 55 oral papers and over 80 poster presentations. The oral program includes keynote sessions on Industrial Case Studies in Protein Chromatography, Industrial Continuous Chromatography, Preparative Chromatography to Support Drug Discovery and Development, and Industrial and Academic Case Studies in Peptide Purification, as well as a Panel Discussion Session on Practical Challenges and Opportunities in Industrial Chromatography. Posters will be on display over a two-day period allowing you interact extensively with the presenters.

PREP 2009 also includes a vibrant Workshop Program as well as an Expanded Vendor Exhibit. The Workshop Program includes two day-long Sunday training courses, one focused on Preparative Chromatography for Small Molecules and the other on Preparative Chromatography for Biomolecules, as well as eleven vendor workshops, offered at breakfast and lunch each day, providing in-depth coverage on chromatography products, processes, and technology. The Exhibit Program includes more than 30 vendor booths through which you can become familiar with the latest commercial advances in the field. We invite you to take advantage of all of these unique training and educational opportunities and to interact with vendors and providers of chromatography media, equipment, processes, and services.

Many people need to be thanked for making PREP 2009 possible. Firstly, we would like to thank the members of the Scientific Advisory Committee and of the Industrial Advisory Committee for their help in planning and promoting the Symposium and reviewing the abstracts. Secondly, we would like to thank our industrial sponsors, who have provided very generous financial support. Thirdly, we would like to thank all of the vendors for participating in the Exhibit and Workshop programs, as well as all of the people who have submitted so many excellent abstracts. Finally, we would like to thank you for attending PREP 2009. We very much hope you will enjoy the meeting and take home with you a wealth of information that will enable you to solve today's separation problems and be prepared for the future of preparative chromatography.

Giorgio Carta, University of Virginia
Olivier Dapremont, Ampac Fine Chemicals
Georges Guiochon, University of Tennessee and ORNL

PREP 2009 Symposium and Exhibit

Symposium Chairmen

Giorgio Carta, University of Virginia
Olivier Dapremont, Ampac Fine Chemicals
Georges Guiochon, University of Tennessee and Oak Ridge National Laboratory

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Giorgio Carta, University of Virginia
Olivier Dapremont, Ampac Fine Chemicals
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Ms. Janet Cunningham, Barr Enterprises
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Phone 301-668-6001 • Email janetbarr@aol.com

The use of cameras and cell phones are not permitted during program sessions. Cameras are permitted on the exhibit floor; however, permission from the exhibitors involved must be obtained before photographs can be taken.

Opinions expressed by individuals presenting abstracts and workshops are not necessarily the opinions of the PREP 2009 Symposium

Free Vendor Workshops

Sign-up for all vendor workshops begins when the exhibit opens on Sunday evening; must sign up to attend

Monday, July 20, 2009 12:45 – 2:00 PM

- Free Vendor Workshop sponsored by Pall Life Sciences:** “Opportunities for Enhanced Process Economics and Improved Product Purity: High-Productivity Ion Exchange Sorbents with Distinctive Selectivity Characteristics” [Meeting Room: Commonwealth A-1 (2nd floor)]
- Free Vendor Workshop sponsored by Bio-Rad Laboratories:** “Two- or Three- Column Platforms for the Purification of Monoclonal Antibodies at Process-Scale” [Meeting Room: Commonwealth A-2 (2nd floor)]
- Free Vendor Workshop sponsored by Novasep:** “Improving mAb Capture Productivity and Enabling Continuous Processing with BioSC Sequential Multi-column Chromatography and Silica Based Protein A Media” [Meeting Room: Congress B (4th floor)]
- Free Vendor Workshop sponsored by PIC Solution:** “New SFC System from PIC Solution for Intelligent Method Development and Preparative Separation” [Meeting Room: Congress C (4th floor)]

Tuesday, July 21, 2009 – 7:30 – 8:45 AM

- Free Vendor Workshop sponsored by MIP Technologies:** “Selective Separation Phases Using Novel Polymer Design” [Meeting Room: Commonwealth A-1 (2nd floor)]
- Free Vendor Workshop sponsored by Semba Biosciences:** “SMB Chromatography is Easy with the Bench-scale Semba Octave™ System” [Meeting Room: Commonwealth A-2 (2nd floor)]

Tuesday, July 21, 2009 – 12:45 – 2:00 PM

- Free Vendor Workshop sponsored by Chiral Technologies:** “Rapid Small Scale Enantio-Purification” [Meeting Room: Commonwealth A-1 (2nd floor)]
- Free Vendor Workshop sponsored by LEWA Pumps and Systems:** “The Newly Developed Concept for the Transport of Fluids in Chromatographic Separation Processes” [Meeting Room: Commonwealth A-2 (2nd floor)]
- Free Vendor Workshop sponsored by Asahi Kasei TechniKrom:** “Gaining Flexibility in the Lab with Modular Preparative HPLC and SMB Systems” [Meeting Room: Congress B (4th floor)]
- Free Vendor Workshop sponsored by Tarpon Biosystems:** “BioSMB: Scaled Down MAb Capture in a Disposable-Format Continuous, Multi-Column Chromatography Process” [Meeting Room: Congress C (4th floor)]

Wednesday, July 22, 2009 – 12:45 – 2:00 PM

- Free Vendor Workshop sponsored by BIA Separations:** “Developing Low Cost Industrial pDNA Purification Process Using CIM HiP2 Plasmid Process Pack™” [Meeting Room: Commonwealth A-1 (2nd floor)]

GENERAL INFORMATION

VENUE	Loews Philadelphia Hotel 1200 Market Street Philadelphia, PA 19107, USA Phone: 215-627-1200
BADGES	A name badge must be worn by each registered participant and accompanying person in order to gain admittance to the meeting and social gatherings.
MEETING LOCATION	The meeting rooms are located in Commonwealth Hall on the second floor of the Loews Philadelphia Hotel.
RECEPTION	Sunday 6:00 PM – 8:00 PM Sponsored in part by Ampac Fine Chemicals
EXHIBITS	The exhibition is an important component of the meeting, so please take the time to thank all the exhibitors for their support of the program. Exhibits, poster sessions, Sunday reception, and coffee breaks are located in Millennium Hall on the second floor of the Loews Philadelphia Hotel.
EXHIBIT HOURS	Sunday 6:00 PM – 8:00 PM Monday 9:00 AM – 4:00 PM Tuesday 9:00 AM – 4:00 PM
FREE VENDOR WORKSHOPS	Free vendor workshops will take place on Monday through Wednesday. You are encouraged to sign up for any vendor workshop beginning when the exhibit opens on Sunday. Don't wait to sign up, as space is limited. Please sign up at the sponsor's booth located on the second floor in MillenniumHall. See page 5 for more details.
POSTER SESSIONS	<ul style="list-style-type: none">– Posters are located on the second floor in the Millennium Ballroom.– Poster boards are labeled with the number corresponding to the abstract number in the Final Program Book (see Author Index in the back of the Final Program).– Posters with program numbers in the P-100 series are presented on Monday.– Posters with program numbers in the P-200 series are presented on Tuesday.– Authors presenting posters are requested to be in attendance at their poster board during the Poster Session on the day of their poster presentation.– All posters are to be put up on Monday between 8:30 AM and 1:00 PM; and removed after Tuesday's Poster Session between 3:25 PM and 5:00 PM (anything remaining after 5:00 PM on Tuesday will be discarded).
POSTER COMPETITION	Poster presentations are a vitally important component of the symposia series. In order to acknowledge their contribution to the high standards and in-depth communications amongst practitioners, awards will be offered to the best posters at PREP 2009. All presented posters will be evaluated on the basis of scientific content, clarity of presentation, and layout. If a poster author does not want his/her poster considered for a poster award, they must notify the Symposium Manager before 4:00 p.m. on Tuesday, July 21. Presentation of Best Poster Awards will take place during the conclusion of the meeting on Wednesday. The winners do not have to be present to win. Poster Session Chair: Dr. Igor Quinones-Garcia, Schering-Plough Research Institute.
AUTHOR INDEX	The Author Index is located in the back of the Final Program Book "L" preceding the abstract number = Lecture "P" preceding the abstract number = Poster
REGISTRATION	Sunday 6:00 PM – 8:00 PM Tuesday 8:15 AM – 5:00 PM Monday 8:15 AM – 5:00 PM Wednesday 8:30 AM – 4:00 PM
MESSAGES	Located near the meeting rooms will be a board for messages as well as for posting notices of positions available and positions wanted.

PREP 2009 Scientific Program

Sunday, July 19, 2009

- 9:00 am – 5:00 pm **WORKSHOP 1**
Preparative Chromatography for Small Molecules
Location: Commonwealth A-1
Lecturers: Olivier Dapremont, Ampac Fine Chemicals; Attila Felinger, University of Pecs, Hungary; Kathleen Mihlbachler, Bristol-Myers Squibb; Joan Newburger, Johnson & Johnson Consumer Products Worldwide
- Lecture 1: Basic principles of HPLC for small molecules
 - Lecture 2: Optimization and scale-up of preparative chromatography
 - Lecture 3: Simulated Moving Bed, principles and applications
 - Lecture 4. Regulatory aspects
- 9:00 am – 5:00 pm **WORKSHOP 2**
Preparative Chromatography for Biomolecules
Location: Commonwealth A-2
Lecturers: Giorgio Carta, University of Virginia; Alan K. Hunter, Pfizer, Inc.; Alois Jungbauer, BOKU, Vienna, Austria; Joan Newburger, Johnson & Johnson Consumer Products Worldwide
- Lecture 1: Fundamentals of protein chromatography
 - Lecture 2: Stationary phases for biomolecules
 - Lecture 3: Bioprocess chromatography scale-up and design
 - Lecture 4: Regulatory aspects
- 6:00 – 8:00 pm **SYMPOSIUM REGISTRATION OPEN**
- 6:00 – 8:00 pm **EXHIBIT** (Location: Millennium Hall, 2nd floor)
- 6:00 – 8:00 pm **WELCOME RECEPTION** – Sponsored in part by Ampac Fine Chemicals (name badge required)

Monday, July 20, 2009

8:15 am **SYMPOSIUM REGISTRATION OPEN**

9:00 am – 4:00 pm **EXPOSITION** (Location: Millennium Hall, 2nd floor)

8:55 am **WELCOME AND OPENING REMARKS**

1. KEYNOTE: INDUSTRIAL CASE STUDIES IN PROTEIN CHROMATOGRAPHY

Meeting Location: Commonwealth B-C-D (2nd floor)

Chair: Giorgio Carta, University of Virginia

9:00 am L-101 **Displacement Chromatography for the Purification and Enrichment of MAb Charge Variants: A Case Study.** Tony Cano, Taylor Zhang, Justin Bourret, Genentech Inc., South San Francisco, CA, USA

9:20 am L-102 **Process Scale Separation of Persistent Host Cell Proteins from Recombinant Apolipoprotein A-I_{Milano} Using HIC and RPC.** Alan Hunter, Eric Suda, Mark Gustafson, Sa Ho, Pfizer, Inc., Chesterfield, MO, USA

9:40 am L-103 **Development of a Purification Process for an Unstable Receptor Fc-Receptor Fusion Protein.** Richard S. Wright, Priscilla Jennings, Russell Shpritzer, Jonathan Coffman, Wyeth, Andover, MA, USA

10:00 am L-104 **Development of an Effective Two-column Platform Process for Monoclonal Antibody Purification.** John Bodek, Hong Shen, James Ferraro, Kristopher Barnthouse, Pedro Alfonso, Patricia Alred, Centocor Research & Development Inc., Malvern, PA, USA

10:20 am L-105 **A Systematic Approach for Screening and Optimizing Conditions for Biopharmaceutical Purification Using Mixed-mode Gels.** Saravanamoorthy Rajendran, Yuan Chang, David Robbins, Late Stage Purification, MedImmune, Gaithersburg, MD, USA

10:40 am **PAUSE, EXHIBITS, POSTERS**
Location: Millennium Ballroom, 2nd floor

2. BIOMOLECULAR AND PROCESS MODELING

Meeting Location: Commonwealth B-C-D (2nd floor)

Chair: Abraham Lenhoff, University of Delaware

- 11:10 am L-106 **Intelligent Design of Multimodal Chromatographic Systems Using Protein Libraries, NMR, SPR and Multi-scale Simulations.** Steven M. Cramer, Howard P. Isermann
Rensselaer Polytechnic Institute, NY, USA
- 11:30 am L-107 **Combination of High Throughput Experiments with High Performance Computing for Studying Column Liquid Chromatography.** Eric von Lieres¹, Juergen Hubbuch²,
¹Research Centre Juelich, Institute of Biotechnology, Juelich, GERMANY; ²Karlsruhe University, Karlsruhe, GERMANY
- 11:50 am L-108 **pH and Salt Dependence of Protein Adsorption in Ion-exchange Chromatography.** Bertrand Guélat¹, Guido Ströhlein^{1,2}, Thomas Müller-Späth^{1,2}, Marco Lattuada¹, Massimo Morbidelli¹, ¹ETH Zürich, Zürich, SWITZERLAND; ²ChromaCon AG, Zürich, SWITZERLAND
- 12:10 pm L-109 **Process Simulation Tools for Sequential Multi-column Chromatography: Significant Reduction of Process Development Time, Further Process Characterization and Understanding to Comply with Regulatory Requirements.** Hector Osuna Sanchez, Eric Valery, Laurence Pegon, Laurent David, Novasep Process, Pompey, FRANCE
- 12:30–2:00 pm **PAUSE, EXHIBITS, POSTERS, VENDOR WORKSHOPS**
Location of Exhibits and Posters: Millennium Ballroom, 2nd floor
- 12:45–2:00 pm **Free Vendor Workshop sponsored by Pall Life Sciences** (must sign up to attend)
Opportunities for Enhanced Process Economics and Improved Product Purity: High-Productivity Ion Exchange Sorbents with Distinctive Selectivity Characteristics
Meeting Room: Commonwealth A-1 (2nd floor)
- 12:45–2:00 pm **Free Vendor Workshop sponsored by Bio-Rad Laboratories** (must sign up to attend)
Two- or Three- Column Platforms for the Purification of Monoclonal Antibodies at Process-Scale
Meeting Room: Commonwealth A-2 (2nd floor)
- 12:45–2:00 pm **Free Vendor Workshop sponsored by Novasep** (must sign up to attend)
Improving mAb Capture Productivity and Enabling Continuous Processing with BioSC Sequential Multi-column Chromatography and Silica Based Protein A Media
Meeting Room: Congress B (4th floor)
- 12:45–2:00 pm **Free Vendor Workshop sponsored by PIC Solution** (must sign up to attend)
New SFC System from PIC Solution for Intelligent Method Development and Preparative Separation
Meeting Room: Congress C (4th floor)
- 2:00–3:25 pm **POSTER SESSION I** (Location: Millennium Ballroom, 2nd floor)

3A. MONOLITH AND MEMBRANE CHROMATOGRAPHY - I

Meeting Location: Commonwealth A-B (2nd floor)

Chair: Andreas Seidel-Morgenstern, Max-Planck Institute Magdeburg

- 3:30 pm L-110 **Structure-based Modeling of Flow and Dispersion in a Polymeric Monolith.** Harun Koku¹, Kirk J. Czymmek², Abraham M. Lenhoff¹, Mark R. Schure³, Robert S. Maier⁴,
¹Department of Chemical Engineering, University of Delaware, Newark, DE, USA; ²Department of Biological Sciences, University of Delaware, Newark, DE, USA; ³Theoretical Separation Science Laboratory, Rohm and Haas Company, Spring House, PA 19477, USA; ⁴Information Technology Laboratory, U.S. Army Engineer Research and Development Center, Vicksburg, MS, USA
- 3:50 pm L-111 **Peak Spreading, Binding Site and Elution Behavior of DNA and Other Large Biomolecules in Monolithic Short-layer Ion Exchange Chromatography.** Shuichi Yamamoto, Noriko Yoshimoto, Yukiko Nishizumi, Yamaguchi University, Ube, JAPAN
- 4:10 pm L-112 **Development of a Process Model for the Capturing of Proteins with Membrane Adsorbers.** P. van Beijeren, M. Puthirasigamany, P. Kreis, Technische Universität Dortmund, Dortmund, GERMANY

4:30 pm **PAUSE**

3B. MECHANISMS AND MODELING - I

Meeting Location: Commonwealth C-D (2nd floor)

Chair: Alan Hunter, Pfizer

- 3:30 pm L-113 **Estimation of Column Efficiency by Analyzing Tailing Peak Profiles.** Kanji Miyabe, University of Toyama, Toyama, JAPAN
- 3:50 pm L-114 **Adsorption Properties of Reversed-phase Packing Materials.** Attila Felinger, Péter Vajda, University of Pécs, Pécs, HUNGARY
- 4:10 pm L-115 **Determination of the Adsorption Isotherm Parameters from Total Protein Mixture.** Sivakumar Palani¹, Guhan Jayaraman¹, Ludmila Gueorguieva², Ursula Rinas³, Andreas Seidel-Morgenstern^{2,4}, ¹Department of Biotechnology, Indian Institute of Technology-Madras, Chennai, INDIA; ²Institute of Process Engineering, Otto-Von-Guericke-Universität, Magdeburg, GERMANY; ³Helmholtz Centre for Infection Research, Braunschweig, GERMANY; ⁴Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, GERMANY
- 4:30 pm **PAUSE**

4A. MONOLITH AND MEMBRANE CHROMATOGRAPHY - II

Meeting Location: Commonwealth A-B (2nd floor)

Chair: Joan Newburger, Johnson & Johnson Consumer and Personal Products Worldwide

- 4:50 pm L-116 **Performance of Conventional and Grafted Methacrylate Monolithic Columns for Proteins, Plasmids and Phages.** A. Podgornik, V. Frankoviè, F. Smrekar, N. Lendero, J. Janèar, A. Strancar, BIA Separations d.o.o., Ljubljana, SLOVENIA
- 5:10 pm L-117 **Microscaled Sorption Analysis of Baculoviruses for Gene Therapy on Ion-exchange Surfaces Using Surface Plasmon Resonance.** Tiago Vicente¹, José P. M. Mota², Manuel J. T. Carrondo^{1,3}, Paula M. Alves¹, ¹IBET/ITQB-UNL, Oeiras, PORTUGAL; ²Requimte/CQFB, FCT/UNL, Caparica, PORTUGAL; ³FCT/UNL, Caparica, PORTUGAL
- 5:30 pm L-118 **Affinity Capture of Cell Culture-derived Influenza Virus Particles.** L. Opitz¹, S. Lehmann¹, A. Zimmermann¹, J. Hohlweg², U. Reichl^{1,3}, M. W. Wolff^{1,3}, ¹Bioprocess Engineering, Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, GERMANY; ²South Westphalia University of Applied Sciences, Iserlohn, GERMANY; ³Bioprocess Engineering, Otto-von-Guericke-University, Magdeburg, GERMANY

5:50 pm **PAUSE**

4B. BIOCHROMATOGRAPHY - I

Meeting Location: Commonwealth C-D (2nd floor)

Chair: Martha Knight, CC Biotech

- 4:50 pm L-119 **Protein Refolding by Means of Gradient Chromatography.** Esteban J. Freydel¹, Michel H. M. Eppink², Gijs W.K. van Dedem^{1,2}, Luuk A.M. van der Wielen¹, Marcel Ottens¹, ¹Department of Biotechnology, Delft University of Technology, THE NETHERLANDS; ²Schering-Plough, Oss, THE NETHERLANDS
- 5:10 pm L-120 **On-column Refolding of Proteins Using Npro Fusion Technology.** Rainer Hahn^{1,2}, Elisabeth Schmöger^{1,2}, Barbara Kanatschnig¹, Eva Berger¹, Astrid Dürauer^{1,2}, Alois Jungbauer^{1,2}, ¹Austrian Center of Biopharmaceutical Technology (ACBT), Vienna, AUSTRIA; ²Department of Biotechnology, University of Natural Resources and Applied Life Sciences Vienna, Vienna, AUSTRIA
- 5:30 pm L-121 **Enhancing Monoclonal Antibody (mAb) Activity by Removal of Less Active mAb Isoforms Using Continuous Chromatography (MCSGP).** Thomas Müller-Spàth^{1,2}, Guido Ströhlein^{1,2}, Lars Aumann^{1,2}, Massimo Morbidelli¹, ¹ETH Zürich, Zürich, SWITZERLAND; ²ChromaCon AG, Zürich, SWITZERLAND

5:50 pm **PAUSE**

Tuesday, July 21, 2009

7:30–8:45 am **Free Vendor Workshop sponsored by MIP Technologies** (must sign up to attend)
Selective Separation Phases Using Novel Polymer Design
Meeting Room: Commonwealth A-1 (2nd floor)

7:30–8:45 am **Free Vendor Workshop sponsored by Semba Biosciences** (must sign up to attend)
SMB Chromatography is Easy with the Bench-scale Semba Octave™ System
Meeting Room: Commonwealth A-2 (2nd floor)

8:15 am **SYMPOSIUM REGISTRATION OPEN**

9:00 am – 4:00 pm **EXPOSITION** (Location: Millennium Hall, 2nd floor)

5. KEYNOTE: INDUSTRIAL CONTINUOUS CHROMATOGRAPHY

Meeting Location: Commonwealth B-C-D (2nd floor)
Chair: Olivier Dapremont, Ampac Fine Chemicals

9:00 am L-201 **Daicel's Experiences in Chiral SMB Separation from Bench to Industrial Scale.**
Kazuyuki Akita, Life Science Development Center, CPI Company, Daicel Chemical Industries,
Ltd., Myoko, JAPAN

9:20 am L-202 **Simulated Moving Bed Chromatography for Pharmaceutical Development.**
Olav K. Lyngberg, Nuria de Mas, Doris C. Chen, Eric W. Sortore, Mark Lindrud, Kathleen
Mihlbachler, Brent D. Karcher, Bristol-Myers Squibb Company, New Brunswick, NJ, USA

9:40 am L-203 **A Two-step MCC Separation of a Chiral Catalyst Intermediate.** Charles M. Grill,
Pfizer Inc., Groton, CT, USA,

10:00 am L-204 **Preparative Chiral Chromatography Challenges within the Pharmaceutical
Industry: From Route Scouting to Commercial Production.** Eric Valery¹, Olivier Ludemann-
Hombourger¹, Eric Lang¹, Ousmane Diouf², Jean-François Marcoux², ¹Novasep Process,
Pompey, FRANCE ; ²Novasep Synthesis, Chasse-sur-Rhône, FRANCE

10:20 am L-205 **Accelerating Continuous Chromatography Development with In-silico QbD.**
Danielle Horneman¹, Marc Bisschops², Maarten Pennings¹, ¹Xendo Manufacturing, Leiden, THE
NETHERLANDS; ²Tarpon Biosystems Inc., Marlborough, MA, USA

10:40 am **PAUSE, EXHIBITS, POSTERS**
Location: Millennium Ballroom, 2nd floor

6. CONTINUOUS CHROMATOGRAPHY MODELING AND OPTIMIZATION

Meeting Location: Commonwealth B-C-D (2nd floor)

Chair: Kathleen Mihlbachler, Bristol-Myers Squibb

- 11:10 am L-206 **Production of Single Enantiomers by Integrating Simulated Moving Bed Chromatography and Racemization Reactions.** Javier García Palacios¹, Malte Kaspereit¹, Achim Kienle^{1,2}, ¹Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, GERMANY; ²Otto-von-Guericke University, Magdeburg, GERMANY
- 11:30 am L-207 **'Cycle to Cycle' Optimizing Control of Simulated Moving Beds for a Nonlinear Chiral Separation—Theory and Experiments.** Christian Langel¹, Cristian Grossmann², Marco Mazzotti¹, Manfred Morari², Massimo Morbidelli³, ¹Institute of Process Engineering, ETH Zürich, Zürich, SWITZERLAND; ²Automatic Control Laboratory, ETH Zürich, Zürich, SWITZERLAND; ³Institute for Chemical and Bio-Engineering, ETH Zürich, Zürich, SWITZERLAND
- 11:50 am L-208 **Design of a Classic Simulated Moving Bed Unit for the Separation of Propane/ Propylene.** Pedro Sá Gomes, Nabil Lamia, Alfrío E. Rodrigues, University of Porto, Porto, PORTUGAL
- 12:10 pm L-209 **Performance Optimization of SMB Chromatography with Double Fractionation and Feedback of Outlet Streams.** Suzhou Li¹, Yoshiaki Kawajiri², Joerg Raisch^{1,3}, Andreas Seidel-Morgenstern^{1,4}, ¹Max-Planck-Institut fuer Dynamik of Komplexer Technischer Systeme, Magdeburg, GERMANY; ²School of Chemical and Biomolecular Engineering, Georgia Institute of Technology, Atlanta, GA, USA; ³Fachgebiet Regelungssysteme, Technische Universitaet Berlin, Berlin, GERMANY; ⁴Institut fuer Verfahrenstechnik, Otto-von-Guericke Universitaet, Magdeburg, GERMANY
- 12:30–2:00 pm **PAUSE, EXHIBITS, POSTERS, VENDOR WORKSHOPS**
Location of Exhibits and Posters: Millennium Ballroom, 2nd floor
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Meeting Room: Commonwealth A-1 (2nd floor)
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The Newly Developed Concept for the Transport of Fluids in Chromatographic Separation Processes
Meeting Room: Commonwealth A-2 (2nd floor)
- 12:45–2:00 pm **Free Vendor Workshop sponsored by Asahi Kasei TechniKrom** (must sign up to attend)
Gaining Flexibility in the Lab with Modular Preparative HPLC and SMB Systems
Meeting Room: Congress B (4th floor)
- 12:45–2:00 pm **Free Vendor Workshop sponsored by Tarpon Biosystems** (must sign up to attend)
BioSMB: Scaled Down MAb Capture in a Disposable-Format Continuous, Multi-Column Chromatography Process
Meeting Room: Congress C (4th floor)
- 2:00–3:25 pm **POSTER SESSION II** (Location: Millennium Ballroom, 2nd floor)

7A. NEW AND IMPROVED STATIONARY PHASES - I

Meeting Location: Commonwealth A-B (2nd floor)
Chair: Shuichi Yamamoto, Yamaguchi University

- 3:30 pm L-210 **Bi-layered SEC-IEC Chromatography Media for Improved Separation of Biological Nanoplexes.** E. Theodosiou, A. M. Liddy, O. R. T. Thomas, University of Birmingham, Birmingham, UK
- 3:50 pm L-211 **Further Advances in UNOsphere Technology: Design for Protein A Affinity Chromatography.** Danni Wang, Yueping Xu, Hong Chen, Jiali Liao, Larry Cummings, Russ Frost, Bio-Rad Laboratories, Hercules, CA, USA
- 4:10 pm L-212 **Development of Temperature Responsive Resins.** P. Maharjan^{1,2}, M. T. W. Hearn², W. R. Jackson², K. De Silva¹, B. W. Woonton¹, ¹Food Science Australia, Victoria, AUSTRALIA; ²ARC Special Research Centre for Green Chemistry, Monash University, Victoria, AUSTRALIA

4:30 pm **PAUSE**

7B. BIOCHROMATOGRAPHY - II

Meeting Location: Commonwealth C-D (2nd floor)
Chair: Neville Pinto, University of Cincinnati

- 3:30 pm L-213 **Polyethylene Glycol Precipitation of Monoclonal Antibodies and the Impact on Column Chromatography.** Glen Giese, Genentech Inc., South San Francisco, CA, USA
- 3:50 pm L-214 **Development of a Downstream Process for Purification of a Monoclonal Antibody at Clinical Scale, A Case Study.** Kjell Eriksson, Gustav Rodrigo, Annika Forss, Jakob Liderfelt, Janne Simola, GE Healthcare Bio-Sciences AB, Uppsala, SWEDEN
- 4:10 pm L-215 **Downstream Alternatives for the Production of Monoclonal Antibodies – A Holistic Comparison of Capture Processes with or without Protein A.** Katherina Bauer¹, S. Sievers¹, K. Sulzbacher¹, M. Schulte², A. Stein², G. Schembecker¹, ¹Technische Universität Dortmund, Dortmund, GERMANY; ²Merck KGaA, Darmstadt, GERMANY

4:30 pm **PAUSE**

8A. NEW AND IMPROVED STATIONARY PHASES - II

Meeting Location: Commonwealth A-B (2nd floor)

Chair: Owen Thomas, University of Birmingham

- 4:50 pm L-216 **Engineering of Immunoaffinity Chromatography.** Alois Jungbauer, Marlene Zandian, University of Natural Resources and Applied Life Sciences, Vienna, AUSTRIA
- 5:10 pm L-217 **Size-selective Protein-protein Separations Using Spherical Mesoporous Silicates.** Amina Darwish, Rebecca Desch, Stephen W. Thiel, Neville G. Pinto, University of Cincinnati, Cincinnati, OH, USA
- 5:30 pm L-218 **What Is All the Fuss About Molecularly Imprinted Polymers (MIPs)? How Selective Resins Can Solve Demanding Separations.** Brian Boyd, Ecevit Yilmaz, Anna-Karin Wihlborg, Ola Karlsson, Anthony Rees, MIP Technologies AB, Lund, SWEDEN

5:50 pm **PAUSE**

8B. MECHANISMS AND MODELING - II

Meeting Location: Commonwealth C-D (2nd floor)

Chair: Attila Felinger, University of Pecs

- 4:50 pm L-219 **Mass Transfer Mechanism of Proteins in Packed Columns Under Variable Pressure Conditions.** Fabrice Gritti, Georges Guiochon, University of Tennessee, Knoxville, TN, USA and Oak Ridge National Laboratory, Oak Ridge, TN, USA
- 5:10 pm L-220 **Pore Diffusion in Biochromatography.** Helen Thomas^{1,2}, Guiseppe Storti¹, Alessandro Butté¹, Matthias Joehnck², Michael Schulte², Massimo Morbidelli¹, ¹ETH Zürich, Zürich, SWITZERLAND; ²Merck KGaA, Darmstadt, GERMANY
- 5:30 pm L-221 **Effects of Temperature Manipulation in HIC Separations.** Renata Muca, Wojciech Piątkowski, Dorota Antos, Rzeszow University of Technology, Rzeszow, POLAND
- 5:50 pm **PAUSE**

Wednesday, July 22, 2009

8:30 am **SYMPOSIUM REGISTRATION OPEN**

9. KEYNOTE: PREPARATIVE CHROMATOGRAPHY TO SUPPORT DRUG DISCOVERY AND DEVELOPMENT

Meeting Location: Commonwealth B-C-D (2nd floor)

Co-chairs: Christopher Welch, Merck & Co., Inc., and Larry Miller, Amgen

- 9:00 am L-301 **Solvent and Stationary Phase Selectivity in Fast, Small Scale Preparative SFC.** Geoffrey B. Cox, Bruce Coryell, James Lee, Norbert Maier, Chiral Technologies, Inc., West Chester, PA, USA.
- 9:20 am L-302 **Generic Isolation of Compounds from Purification Processes Using Solid-phase Trapping – Opportunities to Avoid Evaporation and Provide High Weight-purity Compounds.** Bob Boughtflower¹, Przemek Stasica², Tim Underwood¹, ¹GlaxoSmithKline, UK; ²Shimadzu Corporation, Milton Keynes, UK
- 9:40 am L-303 **Application of Preparative Chromatography to Accelerate Drug Development.** Xiqin Yang, Leo Hsu, GlaxoSmithKline, King of Prussia, PA, USA
- 10:00 am L-304 **A Highly Automated 5 Pump (3 Gradient, 2 Isocratic), 4 Detector (2 UV, ELSD and MS) Supercritical Fluid Chromatography (SFC) System for Chiral Purification in Drug Discovery.** Qing Ping Han, Mark J. Hayward, Lundbeck Research USA, Paramus, NJ, USA
- 10:20 am L-305 **A Different Kind of Large Scale Chromatography: The Growing Importance of High Throughput Purification in Drug Discovery and Development.** Christopher J. Welch, Merck & Co., Inc., Rahway, NJ, USA
- 10:40 am **PAUSE**

10. KEYNOTE: INDUSTRIAL AND ACADEMIC CASE STUDIES IN PEPTIDE PURIFICATION

Meeting Location: Commonwealth B-C-D (2nd floor)

Chair: Nick Mitchell, Sohve Corporation

- 11:10 am L-306 **Feasibility of Polypeptide Separations via Supercritical Fluid Chromatography.**
M. T. Combs, M. Ashraf-Khorassani, Larry T. Taylor, Virginia Tech, Blacksburg, VA, USA
- 11:30 am L-307 **Overloaded Band Profiles of Compounds having Two pKa Eluted in Insufficiently Buffered Mobile Phases. Application to the Elution of Small Peptides in RPLC.** Fabrice Gritti, Georges Guiochon, University of Tennessee, Knoxville, TN, USA and Oak Ridge National Laboratory, Oak Ridge, TN, USA
- 11:50 am L-308 **Relevant Versus Irrelevant Facts in RP-HPLC Peptide and Protein Purification.**
Sylvia Winkel Pettersson, Johan Ekeröth, Anders Törnåcrona, Akzo Nobel, Bohus, SWEDEN
- 12:10 pm L-309 **Large Scale Preparative Chromatography of Peptide Drug Candidates.**
Jeanne M. Dorweiler, Roche Colorado Corporation, Boulder, CO, USA

12:30–2:00 pm **PAUSE**

- 12:45–2:00 pm **Free Vendor Workshop sponsored by BIA Separations** (must sign up to attend)
Developing Low Cost Industrial pDNA Purification Process Using CIM HiP2 Plasmid Process Pack™
Meeting Room: Commonwealth A-1 (2nd floor)

- 2:00–3:30 pm **PANEL DISCUSSION – Practical Challenges and Opportunities in Industrial Chromatography**
Meeting Location: Commonwealth B-C-D (2nd floor)
Chair: Geoffrey Cox, Chiral Technologies

Panelists

Olivier Dapremont, Ampac Fine Chemicals, Rancho Cordova, CA, USA
Xuemei He, Bio-Rad Laboratories, Hercules, CA, USA
Russell Jones, Pall Life Sciences, East Hills, NY, USA
David Robbins, MedImmune, Inc., Gaithersburg, MD, USA
Yvan Ruland, Novasep, Inc., Philadelphia, PA, USA
Christopher Welch, Merck & Co., Inc., Rahway, NJ, USA

Preliminary Discussion Topics:

Solvent recycling	Controlling mobile phase composition
Solvent testing	Regulatory aspects for biological applications
Product recovery	Meeting the capacity downstream bottleneck
Sample preparation and prefiltration	in mAb production
Solubility issues	The challenge of biosimilars
Storage and handling of packing materials	Clean-in-place requirements and practices
Maintaining and validating columns	Occupational health and safety issues in chromatography

Program

Each panelist will make a brief leadoff presentation addressing contemporary challenges and opportunities in the practice of industrial chromatography. Comments and discussion by the audience and additional questions from the floor will follow each panelist's presentation.

11. BIOCHROMATOGRAPHY – III

Meeting Location: Commonwealth B-C-D (2nd floor)

Chair: Alois Jungbauer, BOKU

- 3:30 pm L-310 **Bacteriophage and Impurity Carryover and Total Organic Carbon Release During Extended Protein A Chromatography.** Scott Lute, Kurt Brorson, U.S. Food and Drug Administration, Silver Spring, MD, USA
- 3:50 pm L-311 **Antibody Purification from Tobacco by Protein A Affinity Chromatography.** Carolyn Hey¹, Ruta Waghmare², Chenming (Mike) Zhang, ¹Virginia Tech, Blacksburg, VA, USA; ²Millipore Corporation
- 4:10 pm L-312 **Optimization of Protein Purification Using Small-scale Separation Columns.** Chris Suh, Lee Hoang, Lisa Thurston, Doug Gjerde, PhyNexus Inc., San Jose, CA, USA
- 4:30 pm L-313 **Finding and Developing Novel Separations Processes.** Edwin N. Lightfoot, Jr., University of Wisconsin, Madison, WI, USA
- 4:50–5:00 pm **CONCLUSION**

Monday Poster Presentations

Location: Millennium Hall, 2nd floor

Session Times: 2:00 – 3:25 PM

Posters with program numbers in the P-100 series are presented during Monday's Poster Session. All posters will remain up for viewing all day Monday and Tuesday. All posters should be mounted onto the poster boards on Monday between 8:30 AM and 1:00 PM and not removed until Tuesday between 3:25 PM and 5:00 PM (anything remaining after 5:00 PM on Tuesday will be discarded).

P-101 Cellufine® Sulfate and Heparin Affinity Chromatography to Capture Cell Culture Derived Vaccinia Virus Particles. Michael Werner Wolff^{1,2}, Corina Siewert², Sylvia Lehmann¹, Sara Post Hansen³, Rene Faber⁴, Udo Reichl^{1,2}, ¹Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, GERMANY; ²Otto-von-Guericke-Universität, Magdeburg, GERMANY; ³Bavarian Nordic A/S, Kvistgård, DENMARK; ⁴Sartorius AG, Göttingen, GERMANY (presented by Lars Optiz)

P-102 Capacity, Mass Transfer Kinetics, Flow Properties and Optimization of a New Protein-A Adsorbent: UNOsphere SUPra. Ernie Perez-Almodovar, Giorgio Carta, University of Virginia, Charlottesville, VA, USA; Danni Wang, Kimberly Brisack, Christopher Foster, Mark Snyder, Russell Frost, Bio-Rad Laboratories, Hercules, CA, USA

P-103 Micropreparative Separation of Ibuprofen Enantiomers on Whelk O1 Stationary Phase. The Effect of Temperature, Mobile Phase Composition, and Sample Size. Elena Reshetova, Leonid Asnin, Institute of Technical Chemistry of the Ural Branch of RAS, Perm, RUSSIA

P-104 Minimizing the Memory Effect on the CHIRALPAK® AD® Stationary Phase. Joel Putnam, Georges Guiochon, University of Tennessee, Knoxville TN, USA

P-105 A Newly Developed Hydrophilic Polymer-based Ion Exchange Chromatography Column for Separation of Various Biological Molecules. Masakatsu Omote, Noriko Shoji, Akiko Matsui, Naohiro Kuriyama, YMC Co., Ltd., Ishikawa, JAPAN

P-106 Protein Adsorption and Transport in Agarose and Dextran-grafted Agarose Media for Ion Exchange Chromatography: Effect of Ionic Strength and Protein Characteristics. Melani C. Stone, Yinying Tao, Giorgio Carta, University of Virginia, Charlottesville, VA, USA

P-107 Purifying Pharmaceutical Grade Plasmid DNA: A Monolith Case Study. F. Smrekar, A. Podgornik, A. Strancar, M. Peterka, BIA Separations d.o.o., Ljubljana, SLOVENIA

P-108 A Novel Plasmid DNA Purification Process: From Laboratory to Production Scale. F. Smrekar, A. Podgornik, A. Strancar, M. Peterka, BIA Separations d.o.o., Ljubljana, SLOVENIA

P-109 Comparing Different SMB Configurations Capable to Separate Ternary Mixtures. Jadwiga Nowak¹, Dorota Antos², Andreas Seidel-Morgenstern^{1,3}, ¹Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, GERMANY; ²Rzeszow University of Technology, Rzeszow, POLAND; ³Otto von Guericke University, Magdeburg, GERMANY

P-110 Experimental Evidence of a Delta-shock in Nonlinear Chromatography. Marco Mazzotti, Abhijit Tarafder, ETH Zürich, Zürich, SWITZERLAND; Fabrice Gritti, Georges Guiochon, University of Tennessee, Knoxville, TN, USA and Oak Ridge National Laboratory, Oak Ridge, TN, USA

P-111 Influence of Sample-solvent on Protein Retention and Mass Transfer Kinetics in Hydrophobic Interaction Chromatography. Renata Muca, Wojciech Piątkowski, Dorota Antos, Rzeszow University of Technology, Rzeszow, POLAND

P-112 Spiral Countercurrent Chromatography. Martha Knight, Thomas M. Finn, CC Biotech LLC, Rockville, MD, USA

P-113 Adsorption Properties of DNA on Hydrophobic and Charged Chromatography Media. Alois Jungbauer, Tina Paril, University of Applied Life Science and Natural Resources Vienna, Vienna, AUSTRIA

Monday Poster Presentations

Location: Millennium Hall, 2nd floor

Session Times: 2:00 – 3:25 PM

- P-114 Application of a Novel Affinity Adsorbent for the Capture and Purification of Recombinant FVIII Compounds. Keith Selvitelli, Justin McCue, Biogen Idec, Cambridge, MA, USA
- P-115 Retention of Catecholamines on Mixed-mode Liquid Chromatography. Tarab Ahmad, Ashwini Geetla, Keerthi Gunduboina, Gunda Ratheesh, Western Illinois University, Macomb, IL, USA
- P-116 Continuous Affinity Purification of Proteins by Simulated Moving Bed Chromatography. Anthony C. Grabski, Alla Zilberman, Robert Mierendorf, Semba Biosciences, Inc., Madison, WI, USA
- P-117 One Step Purification and Scale-up of IgG from Serum. Wei Guo, Michael Jendzeizyk, Klaus Lohse, B. Thiyagarajan, Nandu Deorkar, Mallinckrodt Baker Inc., Phillipsburg, NJ, USA
- P-118 Large Scale Purification of Glucosinolates by Fast Centrifugal Partition Chromatography, an Alternative to Solid Phase Liquid Chromatography. A. Toribio², L. Boudesocque¹, B. Pinel³, M. Lafosse², F. De La Poype³, J.-M. Nuzillard¹, J.-H. Renault¹, R. Devereaux⁴, ¹Université de Reims Champagne-Ardenne, Reims, FRANCE; ²Université d'Orléans, BOrleans, FRANCE; ³Kromaton Sarl, Angers, FRANCE; ⁴Richard Scientific, Inc., Novato, CA, USA
- P-119 Improving the Productivity of Compound Purification - The Isolation and Retrieval of Small Molecules from Prep HPLC Fractions. Ben Yong², Paul Boguszewski¹, Andrew Coffey¹, John Davies¹, Jane Wheeler¹, ¹Varian, Inc., Shropshire, UK; ²Varian, Inc., Lake Forest, CA, USA
- P-120 Utilizing a Design of Experiments Approach to Develop Fast LC Methods for Automated Scale-up to Preparative Chromatography of Antibiotics and Sulfa Drugs. Lori Sandford¹, Graham Shelver², Ben Yong³, Jeff Blacker⁴, Phillip Shymanski⁵, ¹Varian, Inc., Wood Dale, IL, USA; ²S-Matrix, Eureka, CA, USA; ³Varian, Inc., Walnut Creek, CA, USA; ⁴Varian, Inc., RI, USA; ⁵Varian, Inc., Wood Dale, IL, USA
- P-121 Model-based Optimization of Chromatographic Purification of a Polypeptide by Reversed-phase Chromatography. David Gétaz^a, Guido Ströhlein^{a,b}, Alessandro Butté^c, Massimo Morbidelli^a, ^aETH Zürich, Zürich, SWITZERLAND; ^bChromaCon AG, Zürich, SWITZERLAND; ^cLonza AG, Visp, SWITZERLAND
- P-122 Mixed-mode Chromatography for Protein Separation. K. Nakamura, S. Masumoto, K. Komiya, Nanyo Research Laboratory, Tosoh Corporation, Yamaguchi, JAPAN
- P-123 Discovery of Selective Resins for Demanding Separations - The ExploraSep4Process Concept. Brian Boyd, Anna-Karin Wihlborg, Ecevit Yilmaz, MIP Technologies AB, Lund, SWEDEN
- P-124 Comparison of Adsorption Isotherms. Niklas Borg, Karin Westerberg, Marcus Degerman, Bernt Nilsson, Lund University, Lund, SWEDEN
- P-125 A Successful Approach to an Efficient Preparative Liquid Chromatography Purification Method of Tetrahydrolipstatin (i.e. orlistat). Timothy O'Mara¹, Lucien Charles¹, Thomas Kaiser¹, Shen Jie¹, Tomio Yamakoshi², Kazunori Nobuhara², ¹Fuji Silysia Chemical SA, Oconomowoc, WI, USA; ²Fuji Silysia Chemical Ltd.
- P-126 Novel Silica-based Protein A Packing: High (Dynamic Binding) Capacity for Increased Productivity. Laurence Pegon, Margit Holzer, Laurent David, Novasep Process, Pompey, FRANCE (presented by Yvan Ruland)
- P-127 Effect of Mobile Phase Additive (PEG) on the Retention and the Resolution of Proteins and DNA in Electrostatic Interaction Chromatography. Shuichi Yamamoto, Mitsuyo Age, Wataru Saito, Shintaro Higuma, Tomohiko Yoshitake, Mareto Hosono, Noriko Yoshimoto, Yamaguchi University, Ube, JAPAN
- P-128 Investigation of Multimodal Chromatography using Homologous Protein Libraries. Wai Keen Chung, Alex Freed, Melissa Holstein, Scott McCallum, Steven M. Cramer, Rensselaer Polytechnic Institute, Troy, NY, USA

Monday Poster Presentations

Location: Millennium Hall, 2nd floor

Session Times: 2:00 – 3:25 PM

P-129 The Use of High Quality Silica Media in Pilot and Process Scale Chromatography Using Custom Designed High Pressure Process LC Columns and Systems. Reno Nguyen¹, Jochen Saar¹, Bart Denoulet¹, Kim Vind², ¹Grace Davison Discovery Sciences, Deerfield, IL, USA; ²Peak Biotech A/S, Kvistgaard, DENMARK

P-130 Optimization of Silica-based RPLC Materials for Peptide Purification. Anders Törnrona, Johan Ekeröth, Britt Kofoed-Hansen, Sylvia Winkel-Pettersson, Akzo Nobel, Bohus, SWEDEN

P-131 Performance Enhancements for the Thar Prep 80 SFC System: Modifier Stream Injection. Jeffrey P. Kiplinger, Paul M. Lefebvre, Averca Discovery Services Inc., Worcester MA, USA

P-132 Enantio-separation of Ketoprofen on CHIRALPAK[®] AD[®] by SMB: Experimental Determination of "Best" Mobile Phase. Saad Khattabi, Geoffrey B. Cox, Jay M. Ferraro, James K. Lee, Norbert M. Maier, Chiral Technologies Inc., West Chester, PA, USA

P-133 Countercurrent Chromatography Made Simple: How to Harness the Gentle Power of the Liquid Stationary Phase. Lucas R. Chadwick, Samuel M. Pro, Warren Friedl, Cherry Instruments, Chicago, IL, USA

P-134 Effects of pH and Ionic Strength on Protein Adsorption on Ordered Mesoporous Silica Visualized by Confocal Scanning Laser Microscopy. Rebecca Desch, Amina Darwish, Stephen W. Thiel, Neville G. Pinto, University of Cincinnati, Cincinnati, OH, USA

P-135 Peptide Purification: Optimization of a Reversed-phase Chromatographic Purification Step and Effect of Cleaning in Place. Nicola Forrer¹, David Gétaz², Massimo Morbidelli², ¹Zeochem AG, SWITZERLAND; ²ETH Zürich, Zürich, SWITZERLAND

P-136 Novel Ion Exchangers Expanding the Chromatographic Toolbox and Enhancing Downstream Processing Productivity. Jérôme Champagne, Aurélie Topol, Stéphanie Chaudoreille, René Gantier, Pall Life Sciences, Cergy St Christophe, FRANCE

P-137 Global Optimization of the Combined Performance of Two Sequential Chromatography Steps for Monoclonal Antibody Purification. Terry Benner, Daniel Bezila, Mark Teeters, Pedro Alfonso, Patricia Alred, Centocor R&D, Malvern, PA, USA

P-138 Acetonitrile-free HPLC Analysis and Preparative Purification of a Biopharmaceutical Peptide. L. Lloyd, S. Ball, K. Mapp, Varian, Inc., Shropshire, UK

P-139 Interrogating Expanded Beds with Positrons. E. Theodosiou¹, J. Souquet¹, X. Fan², D.J. Parker², J. Liddell³, P. Levison⁴, O.R.T. Thomas¹, Schools of ¹Chemical Engineering, and ²Physics and Astronomy, College of Engineering and Physical Sciences, The University of Birmingham, Birmingham, UK; ³Avecia Biologics Ltd, Cleveland, UK; ⁴Pall Europe Ltd., Portsmouth, UK

M-140 Separation of IgG Monomer from Aggregates Using Cation Exchange Chromatography. Yan Yao, Patricia Rowicki, John Gavin, Igor Quiñones-García, Schering-Plough Research Institute, Union, NJ, USA

M-141 Preparative Purification of Optically Active Pharmaceutical Compounds using Axial Compressed Columns. Peter Rahn, Phenomenex, Torrance, CA, USA (presented by Wayne Daneker)

P-142 Identification of Differentially Expressed Proteins in Dormant and Sprouting *Dioscorea cayenensis* (Round Leaf Yellow Yam) Tubers Following Gel Electrophoresis and Liquid Chromatography. K. Lobban^{1,2}, A. Wheatley¹, F. Oladeinde³, R. Michelin^{4,5}, J. Whittaker³, S. Pramanik³, H. Asemota¹, ¹University of the West Indies, WEST INDIES; ²University of Technology, JAMAICA, ³Morgan State University, ⁴School of Health Sciences, Walden University, Minneapolis, MN, USA, ⁵IUHS, School of Medicine, St. Kitts, WEST INDIES

Tuesday Poster Presentations

Location: Millennium Hall, 2nd floor

Session Times: 2:00 – 3:25 PM

Posters with program numbers in the P-200 series are presented during Tuesday's Poster Session. All posters will remain up for viewing all day Monday and Tuesday. All posters should be mounted onto the poster boards on Monday between 8:30 AM and 1:00 PM and not removed until Tuesday between 3:25 PM and 5:00 PM (anything remaining after 5:00 PM on Tuesday will be discarded).

- P-201 Effects of Weak Acid Group Content on the Chromatographic Behavior and Protein Adsorption Characteristics of Macroporous Polymeric Cation Exchangers. E.X. Perez-Almodovar, Giorgio Carta, University of Virginia, Charlottesville, VA, USA
- P-202 Enantiomeric Analysis of D, L-serine as Naproxen Acyl Derivatives by Micellar Electrokinetic Capillary Chromatography. Yu-Ting Lin, Hsin-Lung Wu, Kaohsiung Medical University, Kaohsiung, TAIWAN
- P-203 Performance Evaluation of MS-directed Preparative SFC with Open-bed Fraction Collection. Christine Aurigemma¹, Steve Zulli², Ziqiang Wang², Jennifer L. Lefler², ¹Pfizer Global R&D, San Diego, CA, USA; ²TharSFC, a Waters Company, Pittsburgh, PA, USA (presented by Tom DePhillipo)
- P-204 Adsorption of the Naproxen Enantiomers on Whelk O1 Chiral Stationary Phase from Water-methanol Buffer Solution. Effect of pH and Buffer Salt Concentration. Leonid Asnin^{1,3}, Georges Guoichon^{1,2}, ¹University of Tennessee, Knoxville, TN, USA; ²Oak Ridge National Laboratory, Oak Ridge, TN, USA; ³Institute of Technical Chemistry, Perm, RUSSIA
- P-205 New Generation of Semi Prep Column by Using Technology of Dynamic Axial Compression Column. Masakatsu Omote, Kiyoshi Morishita, Noriko Shoji, Naohiro Kuriyama, YMC Co., Ltd., Ishikawa, JAPAN
- P-206 Newly Developed High Strength and Chemically Stable Silica Gel Based Preparative Reversed-phase Packing Materials. Masakatsu Omote, Kiyoshi Morishita, Noriko Shoji, Naohiro Kuriyama, YMC Co., Ltd., Ishikawa, JAPAN
- P-207 A Scale-up Study of Saikosaponin Separation Using a Preparative LC System. Lu Ren, Jerry Q. Wang, Jianbo Liu, Agela Technologies Inc., Newark, DE, USA
- P-208 Ion Exchange Behavior of Associating Apolipoprotein A-I Milano. Theresa E. Bankston, Giorgio Carta, University of Virginia, Charlottesville, VA, USA
- P-209 Uniform Sized Polymethacrylic Adsorbent for Preparative Separation and a Family of Polymethacrylic Adsorbents. Tadashi Adachi, Mitsubishi Chemical Corporation, Kanagawa, JAPAN
- P-210 Process Design of Stepwise Elution Chromatography on the Basis of Iso-resolution Curve. Shuichi Yamamoto, Mareto Hosono, Noriko Yoshimoto, Yamaguchi University, Ube, JAPAN
- P-211 Relating Hydrophobic Interaction Chromatography to Protein Precipitation. B. K. Nfor¹, K. Wiedhaup¹, T. Ahamed¹, L. A. M. van der Wielen¹, G. W. K. van Dedem^{1,3}, E. J. A. X. van de Sandt², M. H. M. Eppink³, M. Ottens¹, ¹Delft University of Technology, THE NETHERLANDS; ²DSM Anti-Infectives, Delft, THE NETHERLANDS; ³Schering-Plough, Oss, THE NETHERLANDS
- P-212 Performance and Benefits of Macrocyclic Glycopeptide-based CSPs in Enantiomeric Purification Using Bench-top Simulated Moving Bed (SMB) Technology. J.T. Lee¹, William H. Campbell¹, Tracy L. Ascah¹, Robert Mierendorf², ¹Supelco, Division of Sigma-Aldrich, Bellefonte, PA, USA; ²Semba Biosciences, Madison, WI, USA
- P-213 Hindered Diffusion of Bio-molecules in Porous Chromatographic Beads. Bertrand de Neuville, Abhijit Tarafder, Bertrand Guelat, David Getaz, Helen Thomas, Guido Stroehlein, Massimo Morbidelli, ETH Zürich, Zürich, SWITZERLAND

Tuesday Poster Presentations

Location: Millennium Hall, 2nd floor

Session Times: 2:00 – 3:25 PM

- P-214 Simultaneous Modeling and Optimization of Preparative Chromatography. Fredrik Nielsen, Karin Westerberg, Marcus Degerman, Bernt Nilsson, Lund University, Lund, SWEDEN
- P-215 Model-based Optimization of MCSGP Compared to Batch Chromatography. Niklas Andersson, Karin Westerberg, Marcus Degerman, Bernt Nilsson, Lund University, Lund, SWEDEN
- P-216 The Use of Displacement Chromatography in 2D Analysis of Product Streams. C. Patrick McAtee, Barry L. Haymore, J. P. Woods, Sachem, Inc., Austin, TX, USA
- P-217 HPLC Purification of Synthetic GLP-1 by Using DAISO GEL. Tetsuyuki Saika, Osakazu Nakajima, DAISO Fine Chem USA, Inc., Santa Clara, CA, USA
- P-218 Innovative High Throughput Protein Purification by Parallel Chromatography in 96-Array Formats. Tim Schroeder¹, Jürgen Friedle¹, Irina Kostareva², ¹Atoll GmbH, Weingarten, GERMANY; ²Bio ChromoTools Co, Bronx, NY, USA
- P-219 RP-HPLC Method for the Analysis of Levocetirizine Dihydrochloride and Ambroxol Hydrochloride in Combination and Its Application in the Evaluation of Marketed Preparations. Venisetty R. Kumar, Kamarapu S. Kumar, Vaddiraj R. Venkateshwar, Vaddiraj S. C. Raj, Sri Shivani College of Pharmacy, Warangal, INDIA
- P-220 Unique Approaches to Solve the Downstream Processing “Bottleneck”. Klaus Lohse, Michael Jendzeizyk, B. Thiyagarajan, Nandu Deorkar, Mallinckrodt Baker Inc., Phillipsburg, NJ, USA
- P-221 Optimizing the Performance of Denali® RP Media for Preparative Purification by Using MODcol® Spring® Column and Multipacker® Technology. Reno Nguyen, Susan Diaz, Jochen Saar, Bart Denoulet, Grace Davison Discovery Sciences, Deerfield, IL, USA
- P-222 Negative Solvent Gradient in RP Chromatography for Purifying Pharmaceutical Compounds. Kathleen Mihlbachler, Fernando Quiroz, Doris Chen, Bristol-Myers Squibb Company, New Brunswick, NJ, USA
- P-223 Column and Buffer Selection for the Purification of a Polypeptide Crude Mixture. David Gétaz^a, Nicola Forrer^b, Massimo Morbidelli^a, ^aETH Zürich, Zürich, SWITZERLAND; ^bZeochem AG, Uetikon, SWITZERLAND
- P-224 Characteristics of a Novel Alkaline Stable Protein A Resin. K. Nakamura¹, S. Fujii¹, A. Shima², Y. Hara², E. Majima², ¹Nanyo Research Laboratory, Tosoh, Yamaguchi, JAPAN; ²ProteNova Inc., Kagawa, JAPAN
- P-225 Effect of Ionic Liquids as Mobile Phase Additives on the Retention of Some Amino Acids on Reversed-phase Liquid Chromatography. Tarab Ahmad, Western Illinois University, Macomb, IL, USA; Tariq Zeyad Ahmad, Macomb Senior High School, Macomb, IL, USA
- P-226 Separation of Live Virus from Each Other by Chromatography. Fred Tepper, Leonid Kaledin, Tatiana Kaledin, Argonide Corporation, Sanford, FL, USA
- P-227 Flash SFC and Centrifugal Fraction Collection. Michael Burns, Bert Hedberg, Brian Kangas, Al Chisholm, Modular SFC, Franklin, MA, USA
- P-228 Investigation into the Alternatives to Acetonitrile for the Reverse-phase Analysis of Peptides. L. Lloyd, S. Ball, K. Mapp, Varian, Inc., Shropshire, UK
- P-229 An Industrial Platform for Purifying Influenza Virus Particles. Elisabeth Roethl¹, Ales Podgornik², Matja Peterka², Manuela Gassner¹, Helena Seper¹, Franz Gelhart¹, Marko Banjac², Marko Jarc², Barbara Lah², Petra Kramberger², Nata¹a Menar², Lidija Urbas², Milo Barut², Thomas Muster¹, ¹Avir Green Hills Biotechnology, Vienna, AUSTRIA; ²BIA Separations, Ljubljana, Slovenia and Wilmington, DE, USA

Tuesday Poster Presentations

Location: Millennium Hall, 2nd floor

Session Times: 2:00 – 3:25 PM

P-230 Bacteriophage Purification Using CIM Monoliths. Franc Smrekar¹, Mateja Ciringer¹, Peter Raspor², Ales Podgornik¹, Ales Strancar¹, ¹BIA Separations, Teslova 30, 1000 Ljubljana, SLOVENIA; ²University of Ljubljana, Ljubljana, SLOVENIA

P-231 Design, Construction and Operation of Real SMB Units for the Separation of Chiral Mixtures: The FLEXSMB-LSRE®. Pedro Sá Gomes, Michal Zabka, Miriam Zabkova, Alfrío E. Rodrigues, University of Porto, Porto, PORTUGAL

P-232 In Preparative Scale Gradient Reversed-phase Liquid Chromatography, Load-ability and Peak Shape as a Function of pH and Buffer Concentration for Basic Compounds are Readily Rationalized Based on the Interaction of Eluent Conditions with Analyte Properties. Xu Zhang, David P. Budac, Mark J. Hayward, Lundbeck Research USA, Inc., Paramus, NJ, USA

P-233 Development of a Scalable Process for the Purification of a Porcine Virus from Cell Culture. Jianzhong Hu¹, X.J. Meng², Chenming Zhang², ¹Department of Biomedical Sciences and Pathobiology, Virginia Tech, Blacksburg, VA, USA; ²Department of Biological Systems Engineering, Virginia Tech, Blacksburg, VA, USA

P-234 Investigation of the Mechanism of Protein Adsorption on Ordered Mesoporous Silica Using Flow Microcalorimetry. Amit Katiyar, Stephen W. Thiel, Vadim V. Guliants, Neville G. Pinto, University of Cincinnati, Cincinnati, OH, USA

P-235 Plasma Homocysteine Level and Serum Paraoxonase Activity after Methionine Loading. Hatice Turkeli¹, Tuncer Cayci², E. Ozgur Akgül², Enis Macit³, Z. Ilker Kunak⁴, Erdinc Cakir², Halil Yaman², Kutlay Burak¹, Serif Akman², M. Kemal Erbil², ¹Ankara University Faculty of Pharmacy, Ankara, TURKEY; ²Gulhane Military Medical School, Ankara, TURKEY; ³Gulhane Military Medical School, Ankara, TURKEY; ⁴Gulhane Military Medical School, Ankara, TURKEY

P-236 Comparison of the Cord Blood Neopterin Levels Between Preeclamptic and Normotensive Pregnants. Tuncer Cayci¹, Emin Özgür Akgül¹, Halil Yaman¹, Ibrahim Aydın¹, Hasan Alacam², Esin Özkan¹, Erdinc Cakir¹, Özgür Deren³, Mehmet Kemal Erbil¹, ¹Gulhane Military School of Medicine, Ankara, TURKEY; ²Hacettepe University, Ankara, TURKEY; ³Hacettepe University, Ankara, TURKEY

P-237 Efficacy of Hyperbaric Oxygen Therapy and Medical Ozone Therapy in Experimental Acute Necrotizing Pancreatitis. Serdar Sadir¹, Bulent Uysal¹, Mehmet Yasar², Nail Ersoz², Omer Coskun³, Abdullah Kilic⁴, Tuncer Cayci⁵, Bulent Kurt⁶, Sukru Oter¹, Ahmet Korkmaz¹, Ahmet Guven⁷, ¹Departments of Physiology, ²General Surgery, ³Infectious Diseases, ⁴Clinical Microbiology, ⁵Clinical Biochemistry, ⁶Pathology, ⁷Pediatric Surgery, Gulhane Military Medical Academy, Ankara, TURKEY

P-238 Separation of Caffeine and Acetaminophen by Simulated Moving Bed. Ming-Tsai Liang¹, Junhui Chen², Ru-Chien Liang³, Gao-Zhi Huang⁴, ¹I-Shou University, Kaohsiung, TAIWAN; ²Chung-Yuan Christian University, TAIWAN; ³Asia Giant Engineering CO. LTD., Kaohsiung, TAIWAN; ⁴JOJIA Bio-Tech Co., Kaohsiung, TAIWAN

P-239 Polymeric Fibrillar Monolithic HPLC Columns for Protein Separations. Elizabeth Cates, Amanda Hart, Invenca LLC, Mauldin, SC, USA

P-240 Optimization of Protein Purification Using Small-Scale Separation Columns. Chris Suh, Lee Hoang, Lisa Thurston, Doug Gjerde, Phynexus Inc., San Jose, CA, USA

P-241 Rapid Chemical Warfare Agent Detection in Field with Thermal Desorber. Zeki Ilker Kunak¹, Levent Kenar¹, Sermet Sezigen¹, Ali Oztuna¹, Hakan Yaren¹, Turan Karayilanoglu¹, E.Özgür Akgül², Enis Macit³, ¹GATA Department of Medical CBRN Defense, Ankara, TURKEY; ²GATA Department of Medical Biochemistry, Etlik Ankara, TURKEY; ³GATA Department of Analytical Toxicology, Etlik Ankara, TURKEY

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