

25th International Symposium & Exhibit on the
Separation of Proteins, Peptides & Polynucleotides

— PRELIMINARY SCIENTIFIC PROGRAM —

We encourage you to participate in the meeting by submitting an abstract for poster consideration.
The final deadline to submit is **September 15, 2005**

Sunday, November 6, 2005

The ISPPP Symposium reserves the right, without notice, to modify or amend the roster of Sunday short courses and/or presenters. Any changes will be updated on the web site at www.isppp.org.

**Short Course # 1:
9:00 am – noon**

Multidimensional LC/MS in Proteomics: Potential and Limitations

Presented by Egidijus Machtejevas and Klaus K. Unger, Johannes Gutenberg University, Mainz, Germany; and Rainer Bischoff, University of Groningen, The Netherlands

The course provides an introduction and overview on the various separation strategies by multidimensional LC/MS in proteomics.

The course is divided into three parts:

Introduction: the drivers and stimuli, pioneers and protagonists; where we are now? Basics in brief: biopolymers: structure. Design of functionalised surfaces. Protein surface interactions. LC of biopolymers, separation modes and characteristics. Separation of biopolymers versus traditional HPLC. Principles of multidimensional liquid chromatography, orthogonal and complementary separation modes. How many dimensions do we need? Peak capacity and resolution. Mass loadability issue: preparative and analytical aspects. Gradient operation: fractionation, sampling rate, peak compression and displacement. MD-LC for proteomics: the challenge, advantage of liquid chromatography, the magic triangle, the comprehensive and targeted approach. Developing MD-LC platforms: choice and combination of LC separation modes, speed of analysis, fractionation and trapping issues. General requirements to a MD-LC system: column I.D. and flow rate adjustment, peak capacity and resolution, gradient conditions compatibility of the operation steps), adjustment of column mass loadability. Mass spectrometry boundary conditions. Case studies of the endogenous peptides using various types of biofluids.

Handling and preparation of biofluids and tissues: depletion of high-abundance proteins, proteolytic digestion using on-line reactors, quantitative proteomics based on stable-isotope labelling.

These topics will be highlighted based on applications from the authors' labs as well as on work published in the literature.

Short Course # 2:
9:00 am – noon

Preparative-scale Separation of Biomolecules

Presented by Prof. Alois Jungbauer, University of Natural Resources and Applied Life Sciences, Vienna, Austria

Chromatographic methods play a pivotal role in biotechnology and biopharmaceutical technology, particularly for high molecular mass compounds such as proteins and plasmids. The high level of purity can be only achieved by chromatographic methods. Beside bulk contaminants traces of bioactive compounds such as endotoxins, DNA and other adventitious agents must be efficiently removed from the process solution. In the workshop special emphasis will be put on the description of the characteristics of chromatography media used in bioseparation and how they differ from analytical media and media used for separation of small molecules. Process optimization, scale up and important design criteria will be discussed. The influence of mobile phase composition on resolution, and guidelines for the optimization of selectivity will be presented. An overview on novel stationary phases for protein and polynucleotide separation and examples for novel bioseparation processes using these phases will be given. The difference and applicability of monoliths, beads with a porous shell and polymer grafted beads will be elaborated. In the second part of the workshop the progress on biorecognition for affinity chromatography will be discussed.

Short Course # 3:
1:30 - 4:30 pm

Monolithic Columns: How to Make and Use Them

Presented by Prof. Frantisek Svec, University of California, Berkeley, CA, USA

This workshop will give an introduction to the basics of monolithic stationary phases, their preparation, and selected applications. First, a brief history of monolithic stationary phases, their rebirth at the end of the 1980's and their fast development ever since will be presented. The various approaches to the stationary phases with reduced discontinuity including aligned fibers, rolled textiles, as well as monolithic discs, and columns based on both silica and synthetic polymers will also be introduced. Then, several specific examples of the preparation of monolithic columns based on synthetic polymers will be shown with emphasis on simplicity of both thermally and UV initiated processes and variety of chemistries easily available. Approaches to larger scale monoliths for preparative separations will be described. Also, monolithic materials placed in the currently very popular capillary and microfluidic formats will be presented in more detail. In addition, methods leading to desired chemistries by grafting of pores with selected functional monomers and combinations of various chemistries and functions within the same monolith will also be described. Due to the specifics of monolithic columns enabling high flow rates without compromising the efficiency, high speed/high throughput separations of a variety of compounds including proteins, peptides, nucleic acids, synthetic polymers, and small molecules in HPLC mode can be achieved. Several examples of these separations using monoliths of very diverse shapes and sizes from very large radial flow columns, over analytical scale units, to capillary columns will be shown. Since monolithic columns also represent quite a significant share of all columns used in capillary electrochromatography, their preparation and use in CEC will also be presented. This workshop will be wrapped up by discussing current trends and future developments of this promising new format of stationary phases.

**Short Course # 4:
1:30 - 4:30 pm**

Basics in Biopolymer Mass Spectrometry

Presented by: Guenter Allmaier, Institute of Chemical Technology and Analytics,
Vienna University of Technology, Vienna, Austria

An array of mass spectrometric techniques play, since the introduction of the first, so-called "soft ionization" techniques (Californium-252 Plasma Desorption (PD) and Fast Atom Bombardment (FAB)), a growing role in the characterization of biopolymers, particular due to its unsurpassed sensitivity. The characterization of proteins, oligonucleotides and oligosaccharides without mass spectrometry (determination of the exact molecular mass and primary structure) is no longer *state-of-the-art*. Even in case of secondary and tertiary structure establishment of biopolymers this technology plays an increasing role. The content of the workshop will be divided into three main sections: I. Modern mass spectrometric desorption/ionization techniques for the characterization of biopolymers; II. Basic concepts of tandem- and multistage mass spectrometry of peptides and oligosaccharides; and III. The combination of bioseparation techniques with mass spectrometry. The first and second part of the workshop will cover the basic concepts of the important desorption/ionization techniques (electrospray ionization (ESI), Nano ESI, matrix-assisted laser desorption ionization (MALDI), atmospheric pressure (AP) MALDI) and the recently introduced desorption electrospray ionization (DESI) and in brief the relevant types of mass spectrometric analyzers (time-of-flight (TOF), reflectron TOF, 3D and linear ion traps, quadrupole and its combinations for MS/MS and multistage MS experiments). In the last part of the workshop, the *on-line* as well as *off-line* combination of separation techniques with modern MS instruments will be briefly presented and evaluated in terms of suitability for biopolymer characterization.

6:00 – 8:00 PM

WELCOME RECEPTION (in the meeting hotel)

Monday, November 7, 2005

8:20 am **Opening Remarks** – Mark Schure, Rohm & Haas, Springhouse, PA, USA

PLENARY SESSION

8:30 am (L-01) **The Evolution of High Performance Bioseparation Science from the Nano- to the Macro-scale. A Twenty Five Year ISPPP Perspective.** Milton T. W. Hearn, ARC Special Research Centre for Green Chemistry, Monash University, Clayton, Victoria, AUSTRALIA

Session 1: PEPTIDES

Chair: F. Svec

9:00 am (L-02) **Problems and Pitfalls of Developing Robust Quantitative Bioanalytical LC/MS/MS Methodology to Support Clinical and Non-Clinical Specimen Analysis for Peptide Therapeutics.** Todd M. Branch and Tom Huggins, Procter and Gamble Pharmaceuticals, Mason, OH, USA

9:20 am (L-03) **Development of LC-MS Analysis of Small Cell Lung Cancer Biomarker Pro-GRP.** Bjørn Winther and J. Léon E. Reubsaet, Department of Pharmaceutical Analysis, School of Pharmacy, University of Oslo, NORWAY

9:40 am (L-04) **Problems Associated with Prediction of Peptide Retention Times in Reversed-phase Chromatography.** Brian P. Tripet¹, James M. Kovacs¹, Dziuleta Cepeniene¹, Don Blow², Krys Cios², Colin T. Mant¹, Oleg Krokhin³, Robert S. Hodges¹, ¹Department of Biochemistry and Molecular Genetics, University of Colorado at Denver and Health Sciences Center, Aurora, CO, USA; ²Computer Science and Engineering Department, University of Colorado at Denver and Health Sciences Center, Aurora, CO USA; ³Manitoba Center for Proteomics, University of Manitoba, Winnipeg, Manitoba, CANADA

10:00 am (L-05) **Fast, Two-Dimensional Gradient Elution High Performance Liquid Chromatography of Peptides.** Dwight Stoll, Xiaoli Wang, Adam Schellinger and Peter W. Carr, Department of Chemistry, University of Minnesota, Minneapolis, MN, USA

10:30 am Break / Exhibits

Monday, November 7, 2005

Session 2: PROTEOMICS I

Chair: R. Bischoff

- 11:00 am (L-06) **Proteomics of Prostate and Ovarian Tumor Cells Using Multidimensional Liquid Separations and Mass Mapping.** David M. Lubman¹, Yi Zhu¹, Hye-yeung Kim¹, Yanfei Wang¹, Rong Wu², Kathleen Cho², Manoj Pal¹, Arun Sreekumar², and Arul Chinnaiyan², ¹Department of Chemistry, The University of Michigan, Ann Arbor, MI, USA; ²Department of Pathology, University of Michigan Medical Center, Ann Arbor, MI, USA
- 11:30 am (L-07) **Mining Gold in Serum Proteomes: Discovery of Disease Biomarkers Using Multi-dimensional Protein and Peptide Separation Strategies.** David W. Speicher, The Wistar Institute, Philadelphia, PA, USA
- 12:00 pm (L-08) **Enhanced Reproducibility and Predictability in Serum Proteomics Achieved by Off-gel Isoelectric Focussing of Tryptic Peptides.** S. T. Hoehn, P. Hoerth, D. Hadbawnik and T. Preckel, Agilent Technologies, Waldbronn, GERMANY
- 12:20 pm (L-09) **Quantitative Differential Proteomics Technologies for Complexity Reduction En Route to Defining Novel Molecular Signatures of Protein Biomarkers.** André Schrattenholz, ProteoSys AG, Mainz, GERMANY
- 12:40 pm Break (lunch on own)
- 12:45-1:45 pm **Free Vendor Seminar by Agilent Technologies**
“From Sample to Data; New Developments in Agilent's Portfolio for the Molecular Biologist”
- 12:45-1:45 pm **Free Vendor Seminar by SACHEM**
“Displacement Chromatography 101: Turn Your Small Columns Into Powerful Preparative Tools”
- 1:45-3:15 pm **POSTER PRESENTATIONS**

Monday, November 7, 2005

Session 3: AFFINITY

Chair: M. Hearn

- 3:20 pm (L-10) **Novel Liquid Chromatographic Approaches to Managing Proteomic Analytical Problems.** Barry E. Boyes, Gordon Nicol, Douglas Walker², James Martosella, Hong-bin Liu, Haiying Chen and Nina Zolotarjova, Agilent Technologies Inc., Integrated Biology Solutions, Life Sciences and Chemical Analysis, Wilmington, DE, USA; ²Sun Health Research Institute, Sun City, AZ, USA
- 3:40 pm (L-11) **Immunoaffinity Separation of Plasma Proteins by IgY Microbeads: Meeting the Needs of Proteomic Sample Preparation and Analysis.** Lei Huang¹, Jerald S. Feitelson¹, Kosi Gramatikoff¹, David A. Herold², David L. Allen³, Ravi Amunagama³, Rachel A. Hagler³, Michael R. Pisano³, Jianzhong Zhang⁴, Edna Betgovargez⁴, Michael H. Simonian⁴, Wei-Wei Zhang¹, Xiangming Fang¹, ¹GenWay Biotech, Inc., San Diego, CA, USA; ²VA San Diego Healthcare System and UCSD, La Jolla, CA, USA; ³Proteomic Research Services, Inc., Ann Arbor, MI, USA; ⁴Biomedical Research Division, Beckman Coulter, Inc., Fullerton, CA, USA
- 4:00 pm (L-12) **Two-dimensional Liquid Chromatography for Intact Antibody Pharmacokinetic Analysis.** Robert E. Murphy, Sherri Callans, Marie Gonzales, Bernie Huyghe, Covx Pharmaceuticals Inc., 9361 Judicial Drive, Suite 200, San Diego, CA, USA
- 4:20 pm (L-13) **Identification of Affinity Ligands from Combinatorial Libraries in Minutes with the Use of Encoded Beads.** S. F. Christensen^{1,3}, R. Michael¹, M. Ramos¹, D. Larsen¹, M. Meldal², VersaMatrix A/S, Valby, Copenhagen, DENMARK
- 4:40 pm (L-14) **Use of Fast Chromatographic Separation Combined with Electrophoretical Methods, SELDI-TOF and ESI Mass Spectrometry for Mapping of Membrane Proteins.** Djuro Josic, Mari Kino Brown, Feilei Huang, Helen Callanan, Alison Nicoletti, James Clifton and Douglas C. Hixson, Brown Medical School, Rhode Island Hospital, Providence, RI, USA
- 5:00 pm Adjourn

Tuesday, November 8, 2005

7:15 – 8:15 am **Free Vendor Seminar time slots available**

Session 4: MONOLITHS
Chair: [G. Rozing](#)

- 8:30 am (L-15) **Past, Present, and Future of Monolithic Columns.** [Frantisek Svec](#), Department of Chemistry, University of California, Berkeley, CA, USA
- 9:00 am (L-16) **Monolithic Silica Columns in Liquid Phase Separation Techniques for Proteomics: Design, Potential and Limitations.** [Egidijus Machtejevas](#)¹, Klaus K. Unger¹ and D. Lubda², ¹Institut fuer Anorganische Chemie und Analytische Chemie, Johannes Gutenberg-Universitaet, Mainz, GERMANY; ²Life Science Products and Analytics, Merck KGaA, Darmstadt, GERMANY
- 9:20 am (L-17) **Masstransfer Properties of Plasmids and Nanoparticles on Monoliths and Chromatography Particles with Giga Pores.** Tina Tarmann and [Alois Jungbauer](#), Department of Biotechnology, University of Natural Resources and Applied Life Sciences, Vienna, AUSTRIA
- 9:50 am (L-18) **Macroporous Hydrophilic Gels as New Materials for Monolithic Chromatography.** [Igor Yu. Galaev](#), and Bo Mattiasson, Department of Biotechnology, Center for Chemistry and Chemical Engineering, Lund University, Lund, SWEDEN; Protista International AB, Bjuv, SWEDEN
- 10:10 am Break / Exhibits

Tuesday, November 8, 2005

Session 5: PROTEOMICS II

Chair: D. Lubman

- 10:50 am (L-19) **Activity-based Proteomics of Metalloproteases.** J.R. Freije, T. Klein and R. Bischoff, Centre for Pharmacy, Groningen University, Groningen, THE NETHERLANDS
- 11:20 am (L-20) **Specificity in Non-enzymatic Post-translational Modifications; The Case of Oxidative Stress.** Fred Regnier and Hamid Mirzaei, Department of Chemistry, Purdue University, West Lafayette, IN, USA
- 11:40 am (L-21) **Qualitative and Quantitative Analysis of Proteomic Mixtures by Intact Protein LC/MS.** Scott J. Berger¹, Kevin M. Millea², Ignatius J. Kass¹, Asish .B. Chakraborty¹, Ira S. Krull², and John C. Gebler¹, ¹Waters Life Sciences R&D, Milford, MA, USA; ²Department of Chemistry, Northeastern University, Boston, MA, USA
- 12:00 pm (L-22) **Characterization of Inclusion Body Composition by Proteomic Tools.** Karin Ahner^{1,2}, Waltraud Kaar^{1,2}, Rainer Hahn^{1,2}, Sabine Greinstetter^{1,2}, Franz Clementschitsch^{1,2}, Monika Cserjan-Puschmann^{1,2} and Alois Jungbauer^{1,2}, ¹Austrian Center of Biopharmaceutical Technology, and ²Department of Biotechnology, University of Natural Resources and Applied Life Sciences, Vienna, AUSTRIA
- 12:20 pm (L-23) **New Approaches to Plasma and Serum Proteomics.** M. Hincapie, W. Hancock, H. Baker, Barnett Institute, Northeastern University, Boston, MA, USA
- 12:40 pm Break (lunch on own)
- 12:45-1:45 pm **Free Vendor Seminar time slot available**
- 1:45-3:15 pm **POSTER PRESENTATIONS**

Tuesday, November 8, 2005

Session 6: GLYCOMICS

Chair: C. Mant

3:20 pm (L-24) **Structural and Functional Glycomics: Trolling for Carbohydrate-Binding Proteins with Well-Characterized Bait.** Steven B. Levery, David J. Ashline, Hailong Zhang, Anthony J. Lapadula, Suddham Singh, Andy Hannemann, Heather Eichert, Emma A. Arigi, Vernon N. Reinhold; Department of Chemistry, University of New Hampshire, Durham, NH, USA

3:50 pm (L-25) **Shotgun Glycomics.** Ron Orlando, CCRC/University of Georgia, Athens, GA, USA

Session 7: GENOMICS

Chair: C Mant

4:10 pm (L-26) **Metal-chelate Affinity Adsorption of Nucleic Acids: Effects of Neutral Additives.** Ajish Potty¹, Yuchun Fu¹, Sindhu Balan², George E. Fox², and Richard C. Willson^{1,2}, ¹Department of Chemical Engineering, University of Houston, Houston, TX, USA; ²Department of Biology and Biochemistry, University of Houston, Houston, TX, USA

4:30 pm (L-27) **Rapid SNP Detection by Temperature Gradient Affinity Chromatography.** Shigeo Kato, Tomohisa Katsuda, Ken Nishijima, Mitsumasa Kamura and Yasushi Nishiwada, Graduate School of Science and Technology, Kobe University, Kobe, JAPAN

4:50 pm **LIFETIME ACHIEVEMENT AWARD**

5:00 pm Pause

7:00-10:00 pm **SYMPOSIUM DINNER**

Wednesday, November 9, 2005

7:15 – 8:15 am **Free Vendor Seminar time slots available**

Session 8: PREP
Chair: [A. Jungbauer](#)

- 8:30 am (L-28) **A Novel Countercurrent Continuous Chromatographic Solvent Gradient Process for Biomolecule Purification.** [Lars Aumann](#), [Guido Stroehlein](#), [Abhijit Tarafder](#), [Lena Melter](#), [Marco Mazzotti](#), [Massimo Morbidelli](#), Swiss Federal Institute of Technology, Zurich, SWITZERLAND
- 9:00 am (L-29) **Membrane Chromatography of Nanometer-Sized Bio-Therapeutics.** [Mark Etzel](#) and [William Riordan](#), Department of Chemical and Biological Engineering, University of Wisconsin, Madison, WI, USA
- 9:30 am (L-30) **The Application of Process Analytical Technology (P.A.T.) to the LC Purification of Proteins and Peptides.** [Kimo Sanderson](#), [John Walker](#), TechniKrom Inc., Evanston, IL, USA
- 9:50 am (L-31) **Multicolumn Countercurrent Gradient Purification of the Polypeptide Calcitonin.** [Lars Aumann](#), [Marco Mazzotti](#), [Massimo Morbidelli](#), Swiss Federal Institute of Technology, Zurich, SWITZERLAND
- 10:10 am (L-32) **Multiobjective Optimization Study of a Multi-component Chromatographic Separation Unit with Genetic Algorithm.** [Abhijit Tarafder](#), [Guido Ströhlein](#), [Lars Aumann](#), and [Massimo Morbidelli](#), Institut für Chemie- and Bioingenieurwissenschaften, Swiss Federal Institute of Technology Zurich, ETH-Hönggerberg/HCI, Zurich, SWITZERLAND
- 10:30 am Break

Wednesday, November 9, 2005

Session 9: BIOCHIPS / PROTEOMICS III

Chair: S. Berger

- 11:00 am (L-33) **Use of a Combinatorial Peptide Library to Increase the Breadth of Proteomic Analysis by Concomitantly Diluting High Abundance Proteins While Concentrating Low Abundance Proteins.** Lee Lomas, Vanitha Thulasiraman, Steve Roth, Shanhua Lin and Egisto Boschetti, CIPHERGEN Biosystems Inc., Fremont, CA, USA
- 11:20 am (L-34) **Quantitative Analysis and Characterization of an IgG4 Half-Antibody Using GelChip Capillary Electrophoresis, rpHPLC and rpHPLC/ESI-TOF-MS.** Yelena Lyubarskaya¹, Damian Houde¹ James Woodward¹, Elena Vasilyeva¹, Chenhui Zeng², Kazumi Kobayashi¹ and Rohin Mhatre¹, ¹Analytical Development, ²Analytical Biochemistry, Biogen Idec, Inc., Cambridge, MA, USA
- 11:40 am (L-35) **An Automated and Integrated Alternative to SDS-PAGE: A Microfluidic Device for Protein Sizing and Quantitation that Enables Efficient High Throughput Experimentation.** Adrian Winoto, Andrea Chow, Bahram Fathollahi, Sang Jeong, and Jim Mikkelsen, Caliper Life Sciences, Mountain View, CA, USA
- 12:00 pm (L-36) **CGE-on-the Chip (Bioanalyzer) and MALDI Mass Spectrometry: Tools for the Characterization of Streptomyces Lipase-inhibitor Complexes.** Martin Zehl¹, Roland Müller¹, Ivana Lešćić^{1,2}, Marija Abramčić³, Biserka Kojić-Prodić² and Günter Allmaier¹, ¹Institute of Chemical Technologies and Analysis, Vienna University of Technology, Vienna, AUSTRIA; ²Department of Physical Chemistry, and ³Departments of Organic Chemistry and Biochemistry, Ruđer Bošković Institute, Zagreb, CROATIA
- 12:20 pm Break (lunch on own)
- 12:20–1:20 pm **Free Vendor Seminar time slots available**

Wednesday, November 9, 2005

Session 10: LC GENERAL

Chair: M. Schure

- 1:20 pm (L-37) **Automated High-throughput Screening for Chromatography in Batch Systems and Microscale Columns.** Pierre Schulze Wierling, Tim Schroeder, Matthias Bensch, Jürgen Hubbuch, Institute of Biotechnology, Forschungszentrum Jülich GmbH, GERMANY
- 1:40 pm (L-38) **Maximizing Binding Capacity of Hydrophobic Interaction Chromatography Resins Using Pore Size Optimization.** J. Kevin O'Donnell¹, Emi Sakima², Yoshimi Hashimoto², and Yasutami Mitoma², ¹Tosoh Bioscience, Montgomeryville, PA, USA; ²Scientific Instruments Division, Tosoh Corporation
- 2:00 pm (L-39) **Retention Behavior of Protein Fragments During Reversed-phase Chromatography Separation: Mechanistic Considerations Based on Thermodynamic Analyses and Biophysical Properties.** Eric Pridgen and Thomas Linden, Merck & Co., Inc., Biologics Development and Engineering, Sumneytown Pike, West Point, PA, USA
- 2:20 pm (L-40) **Quantitative Confocal Analysis of Column Dynamics of Single Protein Systems.** Magnus Schroeder, Eric von Lieres, Juergen Hubbuch, Institute of Biotechnology, Forschungszentrum Juelich GmbH, Juelich, GERMANY
- 2:40 pm Break
- 2:50 pm (L-41) **An Experimental Study of Chromatographic Properties of Nanoflow HPLC and HPLC-Chip Columns.** Gerard Rozing, Bernd Glatz, Karsten Kraiczek. Agilent Technologies, Life Science and Chemical Analysis, Waldbronn, GERMANY
- 3:10 pm (L-42) **Studies on the Interaction of Biomolecules with Solvated Immobilised Ligands Commonly Employed in Reversed-Phase Chromatography.** Reinhard I. Boysen, Yeqiu Wang, Agnes J.O. Jong, Yue Yin and Milton T. W. Hearn, ARC Special Research Centre for Green Chemistry, Monash University, Clayton, Victoria, AUSTRALIA
- 3:30 pm (L-43) **Polymer-coated Silica-supports for Bioseparations with Optimized Hydrophobicity.** Z. Bayram-Hahn¹, B.A. Grimes¹, M. Schulte², K.K. Unger¹, ¹Institute for Inorganic Chemistry and Analytical Chemistry, Johannes Gutenberg-University, Mainz, GERMANY; ²Merck KGaA, LSP R&D MDA, Darmstadt, GERMANY
- 3:50 pm **Invitation to ISPPP – 2006.** Alois Jungbauer, Department of Biotechnology, University of Natural Resources and Applied Life Sciences, Vienna, AUSTRIA
- 4:00 pm **Closing Remarks.** Mark Schure, Rohm & Haas, Springhouse, PA, USA
- 4:10 pm Adjourn

POSTER PRESENTATIONS

Posters will be presented on Monday and Tuesday

Post board size: 4 feet high by 8 feet wide

- **Simultaneous Identification and Quantification of Major Bovine Whey Proteins by HPLC and Sandwich ELISAs.** Milos Beran, Petr Hanak, Petr Molik, Marian Urban, and Ivana Zamecnikova, Food Research Institute Prague, Praha, CZECH REPUBLIC
- **Direct Determination in Cell Extracts of Enzymatic Reactions and Kinetics Using Electrospray Mass Spectrometry.** Joseph J. Dalluge^{†*} and Brian Brazeau[‡], Scientific Resources Center[†] and Biotechnology Development Center[‡], Cargill Incorporated, Minneapolis, MN, USA
- **Practical Applications of CD for KCl Pellet Materials.** M. Watanabe, H. Hayakawa, T. Takakuwa, H. Masago, and A. Wada, JASCO Corporation, Tokyo, JAPAN
- **Practical Applications of Powder CD Measurement.** M. Watanabe, H. Hayakawa, T. Takakuwa, H. Masago, and A. Wada, JASCO Corporation, Tokyo, JAPAN
- **Microfluidic High Throughput Protein Analysis.** Peter Barthmaier¹, Tanja Wulff², Carsten Buhlmann², Tobias Preckel², ¹Agilent Technologies, Palo Alto, CA, USA; ²Agilent Technologies, Waldbronn, GERMANY
- **A Compliant Solution for Monitoring Proteins Using a Lab-on-a-Chip Instrument.** Peter Barthmaier¹, Tanja Wulff², Carsten Buhlmann², Marc Valer², Tobias Preckel², ¹Agilent Technologies, Palo Alto, California, USA; ²Agilent Technologies, Waldbronn, GERMANY
- **75µm ID and Miniature Trap Columns with Integrated Design.** Dan DiFeo¹, Hans-Juergen Wirth², Peter Dawes², Ern Dawes², ¹SGE International Pty Ltd, Vic., AUSTRALIA; ²SGE Incorporated, Austin, TX, USA
- **New Columns to Facilitate the Analysis of Post-Translational Modifications by Capillary LC.** D. DiFeo¹, H.J. Wirth², N. Karlsson³, F. Olson³, N. Packer³ and P. Dawes², ¹SGE Inc. 2007 Kramer Lane, Austin, TX, USA; ²SGE International Pty Ltd, Vic., AUSTRALIA; ³Proteome Systems Ltd., North Ryde NSW, AUSTRALIA
- **New High Performance Ion Exchange Resins for Biomolecule Purification.** M. Deetz, J. Fisher, A. Gehris, J. Maikner, B. Polanyer, M. Kinzey and M. VanderHoff, Rohm and Haas Co., Spring House, PA, USA
- **Rapid and Selective Characterization of Influenza Virus Constituents in Monovalent and Multivalent Vaccine Preparations Using Non-porous RP-HPLC Columns.** Virginia Garcia-Cañas, Barry Lorbetskie and Michel Girard, Centre for Biologics Research, Health Canada, Ottawa (ON) CANADA
- **Characterizing the Qualitative and Quantitative Capabilities of a Label-Free MS^e Methodology for Comprehensive Proteomic Analysis.** Scott Geromanos, Jeffery C. Silva, Craig A. Dorschel, Asish B. Chakraborty, Petra Olivova, Martin Gilar, Guo Xhong Li, Marc V. Gorenstein, and Scott J. Berger, Waters Corporation, Milford, MA, USA
- **The 2D-LC Orthogonality and Practical Peak Capacity in 2D-LC-MS/MS Proteomic Analysis.** Martin Gilar, Petra Olivova, Scott Geromanos, Jeffrey C Silva, Craig A. Dorschel, Marc V. Gorenstein, Amy E. Daly, John C. Gebler, Waters Corporation, Milford, MA, USA

- **Open Tubular Capillary Electrochromatography Coupled with Electrospray Ionisation Mass Spectrometry for Peptide Analysis.** Yuanzhong Yang¹, Reinhard I. Boysen¹, Joseph J. Pesek², Maria T. Matyska² and Milton T. W. Hearn¹, ¹ARC Special Research Centre for Green Chemistry, Monash University, Clayton, Victoria, AUSTRALIA; ²Department of Chemistry, San Jose State University, San Jose, CA, USA
- **HisTrap FF Crude, A New IMAC Column for Simple Purification of Histidine-tagged Proteins Directly from Unclearified Cell Lysates.** Jon Lundqvist, Ann Bergh, Lars C. Andersson, Ellinor Ancker, Anna Heijbel, Helena Lindgren, Karin Torstenson and Katarina Öberg, GE Healthcare, SE-Uppsala, SWEDEN
- **New Advancements in Protein Separation.** Hueying Huang, Sepax Technologies, Inc., Newark, DE, USA
- **Analysis of Antibodies and Other High Molecular Weight Proteins of Biotechnical Interest by Capillary Liquid Chromatography Using the ExpressLC[®] System.** Ring-Ling Chien, Hung-Yuan Cheng, David Emlyn Hughes, David Rakestraw, Eksigent Technologies, Livermore, CA, USA
- **Selective Amino-Terminal Labeling of Peptides with Cascade Yellow Succinimidyl Ester.** Mohammad A. Al-Sayah¹, Kirsten Jeffries¹ and Randolph L. Rill^{1,2}, ¹Department of Chemistry and Biochemistry and ²Department of Biomedical Sciences, College of Medicine, The Florida State University, Tallahassee, FL, USA
- **Determination of Protein Oxidation by Mass Spectrometry in Biopharmaceutical Development and Method Transfer to QC.** Yelena Lyubarskaya, Damian Houde and Rohin Mhatre, Analytical Development Biogen Idec, Inc., Cambridge, MA, USA
- **Capillary-Channeled Polymer (C-CP) Fibers as Stationary Phases for Rapid Protein Separations.** Dwella M. Nelson and R. Kenneth Marcus, Department of Chemistry, Clemson University, Clemson, SC, USA
- **Automated Fast-Bead Synthesis of Small Peptides.** Joan Stevens, Mark Muncey, Greg Robinson, Norbert Wodke, Gilson, Inc., Middleton, WI, USA
- **Automated 2D HPLC Using Trap Columns for the Fractionation, Isolation and Screening of Natural Products.** Joan Stevens, Alan Hamstra, Tim Hegeman, and Luke Roenneburg, Gilson, Inc., Middleton, WI, USA
- **Dimension LC: An Automated 2D System Incorporating Ion-Exchange via SPE and RP-HPLC Chromatography for Natural and Biological Products.** Joan M. Stevens, Luke Roenneburg, Alan Hamstra, Gilson, Inc., Middleton, WI, USA
- **A Compact Automated Liquid Handler for Microbatch Protein Crystallography.** Joan Stevens, Bob Widholm, Gary Scharrer and Kirby Reed, and, Gilson, Inc., Middleton, WI, USA
- **Separation and Analysis of PEGylated Aptamers.** Yansheng Wu, Archemix, Cambridge, MA, USA
- **Effect of Negatively Charged Side-chains on Anionic Ion-pairing to Positively Charged Side-chains in Peptides During Reversed-phase Chromatography.** Mitsukuni Shibue, Colin T. Mant, Robert S. Hodges, Department of Biochemistry and Molecular Genetics, University of Colorado at Denver and Health Sciences Center, Aurora, CO, USA
- **Polypeptide Linkers for Over-expression of scFv Diabody.** Yoichi Kumada¹, Tomomi Kawasaki², Yasufumi Kikuchi², Shigeo Katoh², ¹Department of Bioscience and Biotechnology, Okayama University, Okayama, JAPAN; ²Graduate School of Science and Technology, Kobe University, Kobe, JAPAN

- **Examination of Protein-Ligand Interactions in Adsorptive Separations via Surface Plasmon Resonance.** Mark Etzel and William Riordan, Department of Chemical and Biological Engineering, University of Wisconsin, Madison, WI, USA
- **Protein Expression Profiling of Plasma from Retinol-sufficient and Retinol-deficient Rats by 2D-LC and SELDI-TOF MS.** Thomas Linke and Earl H. Harrison, Phytonutrients Laboratory, Beltsville Human Nutrition Research Center, Beltsville, MD, USA
- **Isolation and Purification Techniques Does not Affect Cytotoxic Ability of Protein.** R. S. Michelin¹, K. Lobban², L. Frederick³, J. Stewart¹, M. Jenkins¹, R. Shaw¹, F. Oladeinde⁴, S. Pramanik¹, A. Kinyua⁵, and A. L. Williams¹, ¹Department of Biology, ²Department of Basic Medical Sciences, University of the West Indies, Mona Campus, Kingston, JAMAICA; ³Department of Biology, Howard University, Washington, DC, USA; ⁴Department of Chemistry, ⁵Department of Physics and Complimentary and Alternative Medicine, Public Health Program, Morgan State University, Baltimore, MD, USA
- **Monoclonal Antibody Charge Heterogeneity Characterization.** Eddie N. Kast, Aleni Flores-Nate, and Machinani J. Rao, Analytical Chemistry, Protein Design Labs, Inc., Fremont, CA, USA
- **Refinement of Tentacle-Type Size Exclusion Chromatography Media Via Atom-Transfer Radical Polymerization.** Bryan R. Coad^{1,2}, Charles A. Haynes^{1,3}, Donald E. Brooks^{1,2,4}, ¹Centre for Blood Research; ²Department of Chemistry; ³Michael Smith Laboratories; ⁴Department of Pathology and Laboratory Medicine; University of British Columbia, Vancouver, B.C., CANADA
- **New, High-Affinity, Low-Molecular-Weight Displacers for Preparative Anion- and Cation-Exchange Chromatography of Biomolecules Using Displacement Mode: Properties, Performance, Advantages and Limitations.** Barry L. Haymore, Charles B. Little, Xiaoyue Xiao, Sachem Inc., Austin, TX, USA
- **Use of CIM Affinity Columns for Fast Isolation of Low Abundant Proteins from Complex Biological Mixtures.** Djuro Josic¹, Marijana Rucevic², Feilei Huang¹, Matjaz Peterka³, Ales Strancar³, Helen Callanan², Douglas Hixson², ¹COBRE Center for Cancer Research Development, Rhode Island Hospital, Providence, RI, USA; ²Division of Medical Oncology, Department of Medicine, Rhode Island Hospital, Providence, RI, USA; ³BIA Separations d.o.o., Ljubljana, SLOVENIA
- **Utilizing Displacement Effects for the RP-HPLC Purification of Peptides: Applicability of a General Method.** Sylvia Winkel Pettersson, Britt Kofoed-Hansen, Jörg Scheuerlein, Eka Chemicals AB, Bohus, SWEDEN
- **Selection of Reversed-Phase Chemistries, Column Configurations, and Ion Pairing Agents for LC-MS Analysis of Peptides and Proteins.** Reno Nguyen, Grace Davison, Hesperia, CA, USA
- **Venture A – A High Performance Analytical Column for Monoclonal Antibodies.** Jochen Saar, Gonda VanEssche, Grace Davison, Worms, GERMANY (presented by Reno Nguyen)
- **Combining High Resolution HPLC, Exact Mass Measurement OA-TOF MS, and Advanced Spectral Deconvolution to Measure Protein Modification.** Thomas E. Wheat, Beth L. Gillece-Castro, Ziling Lu and Jeffrey R. Mazzeo, Waters Corporation, Milford, MA, USA
- **Increasing Resolution in Peptide Separations Using Very Small Particle Packing Materials.** Thomas E. Wheat, Ziling Lu, Beth L. Gillece-Castro, and Jeffrey R. Mazzeo, Waters Corporation, Milford, MA, USA
- **Quantitative Analysis of Protein Aggregations by HPLC/Light Scattering.** Mark C. Stochl¹, Arthur Ley¹, Qingye Zhou², Trevor Havard², ¹Dyax Corp., Cambridge, MA, USA; ²Precision Detectors, Inc., Bellingham, MA, USA

- **Prediction of Protein Aggregation Using the Second Virial Coefficient Determined by Light Scattering Detectors.** Qingye Zhou, Trevor Havard, Precision Detectors, Inc., Bellingham, MA, USA
- **Rapid Automated Purification of BVES Expressed Proteins using an AKTA Explorer 3D Chromatography System.** James R. Black, Kumkum Saxena, Michael Wynn, Edward Fox, Vertex Pharmaceuticals, Inc., Cambridge, MA, USA
- **EXPERION™ Automated Electrophoresis System: An Efficient Device for Monitoring Recombinant Protein Expression and Purification.** Xuemei He, Larry Cummings, and William Strong, Bio-Rad Laboratories, Life Science Group, Protein Separations Division, Hercules, CA, USA (presented by Hong Chen)
- **Evaluation of Phosphopeptide Affinity Enrichment Sorbents Using a Standard Phosphopeptide Mixture Sample.** Jennifer Fournier, Ying Qing Yu, Martin Gilar, Grace Credo, Weibin Chen and John C. Gebler, Life Sciences R&D, Waters Corporation, MA, USA
- **Purification of Environmental Peptide Toxins Using Molecular Recognition Surfaces with Post Mass Spectrometry Identification.** Brian P. Gregson¹, David F. Millie^{2,3}, Gary L. Fahnenstiel⁴, David P. Fries¹, ¹Center for Ocean Technology, University of South Florida, St. Petersburg, FL, USA; ²Florida Institute of Oceanography, University of South Florida, St. Petersburg, FL, USA; ³Florida Fish & Wildlife Institute, Florida Fish & Wildlife Commission, St. Petersburg, FL, USA; ⁴Great Lakes Environmental Research Laboratory-Lake Michigan Field Station, NOAA, Muskegon, MI, USA
- **Electronic Gel Protein Transfer Device.** Dawei Zhou*, Haiyong Wang, Huaifeng Wang, College of Pharmaceuticals & Biotechnology, Tianjin University, Tianjin, CHINA
- **A Generic and Rapid Antibody Quantitation Assay Using Affinity Chromatography.** Dace Krasts, SiowFong Wee, Dean Pettit, Amgen Inc., Analytical Sciences, Seattle, WA , USA
- **Sample Preparation for Proteomics Studies – A Novel Technology for Separation and Enrichment of Organelle and Organellar Subtypes.** WenKui Lan, Kate L. Drahos, Danielle E. Kalman and Hung-Cuong Tran, Alfa Wassermann Proteomic Technologies, LLC, West Caldwell, NJ, USA
- **Application of Ceramic Hydroxyapatite (CHT™) for Proteomic Analysis.** Paul Ng, Ning Liu, Chad Eller, Shahram Farshchi, Aran Paulus, Pete Gagnon, Process Applications and New Technologies R&D, Protein Separations Division, Bio-Rad Laboratories Hercules, CA, USA
- **Tackling the Challenges in HIS-Tagged Protein Purification with Profinity IMAC Resin.** Xuemei He, Shane Petersen, Tanis Correa, Ursula Snow, Bio-Rad Laboratories, Life Science Group, Protein Separations Division, Hercules, CA, USA
- **A New Silica Hydrophobic Interaction Chromatography (HIC) Column for Protein Separations and Proteomics Applications with Improved Hydrolytic Stability.** S. Rao, A. Bordunov and C. Pohl, Dionex Corporation, Sunnyvale, CA, USA
- **Improved Chromatography Separation of Monoclonal Antibodies by Weak Cation Exchange Chromatography.** S. Rao, P. McCarthy, A. Heckenberg and C. Pohl, Dionex Corporation, Sunnyvale, CA, USA
- **Application of Analytical CEX Chromatography for the Isolation and Characterization of a Kunitz Domain Protein and its Associated Product-Related Species.** J. Muddiman, J. Wolkovitz, P. Faust, A. Ley, and M. Stochl, Dyax Corp., Cambridge, MA, USA
- **Innovative Surface Chemistry for Advancements of Protein Separation.** Xueying Huang, Sean Huang, C. P. Luo, and Ryan Pringle, Sepax Technologies, Inc., Newark, DE, USA

- **Determination of Polyethylene Glycol Content in Protein Preparation.** Ziping Wei, Susanna Bilbulian, Jingning Li, Gerard Lacourciere, and Mark Schenerman, MedImmune, Inc., Gaithersburg, MD, USA
- **A Novel Nanospray Emitter Design with a Custom Interface for Peptide/Protein nanoLC/MS Analysis.** Ananya Dubey, James P. Murphy III, Jeffrey W. Finch and John C. Gebler, Waters Corporation, Milford, MA, USA
- **Extremely High Efficient Separations for Biological Molecules by Coating Unconventional Narrow Capillary Tubes.** Xueying Huang, Sean Huang, C. P. Luo, Ryan Pringle, Sepax Technologies, Inc., Newark, DE, USA
- **Innovative Surface Chemistry for Advancements of Protein Separation.** Xueying Huang, Sean Huang, C. P. Luo, and Ryan Pringle, Sepax Technologies, Inc., Newark, DE, USA
- **Purification and Characterization of Recombinant HIV-1 gp41 5 and 6-Helix Peptides.** Marcia Kary, Karen Grimm, Anthony Grippe, Gwen Heidecker, Robert Hepler, Matthew Houser, Renee Hrin, Joseph Joyce, Deborah Nahas, Vanessa Sandford, and James Cook. Merck Research Laboratories, West Point, PA, USA
- **Effect of Overall Peptide Hydrophobicity and the Number of Positively Charged Residues on Peptide Retention Behaviour During Reversed-phase Chromatography in the Presence of Anionic Ion-pairing Reagents Varying in Hydrophobicity and Concentration.** Colin T. Mant, Robert S. Hodges, Department of Biochemistry and Molecular Genetics, University of Colorado at Denver and Health Sciences Center, Aurora, CO, USA
- **Weak Cation Exchange Chromatography Employing Alkali Treated Capillary-Channeled Polyester Fibers as Stationary Phase.** Christine M. Straut¹, Kate Stevens² and R. Kenneth Marcus², ¹Department of Chemistry, Clemson University, Clemson, SC, USA; ²School of Materials Science and Engineering, Clemson University, Clemson, SC, USA
- **Development of a New Reversed Phase HPLC Method for the Separation and Quantitation of Desthreonine Insulin and Insulin Related Substances.** Xiangli Zhang, Warren D. Rowland, Renee C. Ricke, and Gregory M. Beck, Eli Lilly and Company, Indianapolis, IN, USA
- **Potential Pitfalls of 18O Based N-linked Glycosylation Site Mapping.** Peggi M. Angel, Jae-Min Lim, Carl Bergmann, Ron Orlando, Lance Wells , Complex Carbohydrate Research Center, University of Georgia, Athens, GA, USA
- **Quantitative Analysis of Digested and Intact Proteins in Human Plasma Using LC-MS.** B.A.P. Buscher, H. Gerritsen, I. van Schöll and L.P. Brüll, Business Unit Analytical Sciences, TNO Quality of Life, Zeist, THE NETHERLANDS
- **Isolation and Characterization of a Unique C-Terminal Isoform of a Recombinant Monoclonal Antibody (mAb) Heavy Chain.** Kari A. Flango, Keith A. Johnson, Bruce S. Tangarone, Jason C. Rouse, Thomas J. Porter, Characterization and Analytical Development Department, Wyeth BioPharma, Andover, MA, USA
- **Refolding of Autoprotease Fusion Proteins.** Waltraud Kaar^{1,2}, Sabine Greinstetter^{1,2}, Philipp Wechner^{2,3}, Clemens Achmüller^{2,3}, Bernhard Auer^{2,3}, Franz Clementschitsch^{1,2}, Karl Bayer^{1,2} and Alois Jungbauer^{1,2,*}, ¹Department of Biotechnology, University of Natural Resources and Applied Life Sciences, Vienna, AUSTRIA; ²Austrian Center of Biopharmaceutical Technology, Vienna, AUSTRIA; ³Institute of Biochemistry, University of Innsbruck, Innsbruck, AUSTRIA
- **Fast Protein Separations with Ion Exchange Columns.** Koji Nakamura, Yoshio Kato, and Shuichi Okuzono, Nan-yo Research Lab., Tosoh Corporation, Yamaguchi, JAPAN

- **Expanding the Proteome: Inner Mitochondria Membrane Subproteome Analysis by 2DE, 2D-LC and Reverse Phase HPLC.** Simon Sheng¹, Todd McDonald^{1,5,6}, Dawn Chen⁴, Young Ko², Peter Pedersen², and Jennifer E. Van Eyk^{1-3,5}, ¹Departments of Medicine, ²Biological Chemistry and ³Biomedical Engineering and ⁴The Technical Implementation and Coordination Core, Johns Hopkins University, Baltimore, MD USA, ⁵Departments of Physiology and ⁶Neuroscience, Queen's University, Kingston, CANADA
- **Micro-Scale Self-Interaction Chromatography: A Bioseparation Process Design Tool.** Tangir Ahamed, Lin Luo, Marcel Ottens, Gijs W.K. van Dedem, Luuk A.M. van der Wielen, Department of Biotechnology, Delft University of Technology, Delft, THE NETHERLANDS
- **Combined Hydrophobic Metal Binding Fusion Tags for Applications in Aqueous Two-phase Partitioning.** Florent Bernaudat, Leif Bülow, Department of Pure and Applied Biochemistry, Centre for Chemistry and Chemical Engineering, Lund University, Lund, SWEDEN
- **Profinity™ Glutathione: A New Media for Purification of GST-tagged Proteins.** Yueping Xu, Mark Berardini, Lee Olech, Xuemei He, Chad Eller, Danni Wang, Michael Urban, Jiali Liao and Hong Chen, Bio-Rad Laboratories, Inc., Hercules, CA, USA
- **Ion Exchange Chromatography (IEC)-HPLC Method Development for Monoclonal Antibody Erbitux® and Partial Characterization of Its Charged Isoforms.** Ming-Ching Hsieh, Inder Patel, Ashok Purohit, Jun Quan, Babita Saxina, Tun Liu, Ann Daus, S. Joseph Tarnowski, and Qinwei Zhou, Department of Bioanalytical Science, ImClone Systems Incorporated, Branchburg, NJ, USA
- **High Resolution Analyses of Proteins by Ion-exchange Chromatography.** Yoshio Kato, Koji Nakamura, Takashi Kitamura, Teruhiko Tsuda, Nanyo Research Laboratory, Tosoh Corporation, Yamaguchi, JAPAN
- **Effects of Gradient Slope, Column Length and Column Particle Size on Nano LC/MS/MS Analysis of Proteomic Samples.** Hongji Liu, Jeffrey W. Finch, John C. Gebler, Life Sciences R&D, Waters Corporation, Milford, MA, USA
- **SEC-HPLC Analysis of a High Concentration Monoclonal Antibody.** Farah Natoli, Bruce Tangarone, Thomas Porter, Department of Characterization and Analytical Development, Wyeth, Andover, MA, USA
- **Free Flow Electrophoresis (FFE) as a Multifunctional Separation for Isolating Isoforms of Protein Species.** R. Wildgruber¹, P. O'Mullan², G. Weber¹, C. A. Gelfand², U. Sukop¹ and C. Eckerskorn¹, BD Diagnostics, ¹Innovation Center Biotechnology, Martinsried, GERMANY; ²Franklin Lakes, NJ, USA
- **Glycation of a Therapeutic Monoclonal Antibody: Where It Is and How It Affects Charge-based Behavior.** Cynthia Quan, Emily Wilkes, and Stacey Ma, Analytical Development Department, Genentech, Inc., South San Francisco, CA, USA
- **Plasmid Adsorption to Anion-exchange Chromatography Matrices.** Peter Tiainen, Per-Erik Gustavsson, Per-Olof Larsson, Department of Pure and Applied Biochemistry, Lund University, Lund, SWEDEN
- **Influence of Buffer Composition on Equilibrium and Uptake Kinetic of Proteins on Tentacle Media.** Anne Tscheliessnig^{1,2}, Barbara Kanatschnig^{1,2}, Rainer Hahn^{1,2}, Alois Jungbauer^{1,2}, ¹Austrian Center of Biopharmaceutical Technology, Vienna, AUSTRIA; ²Department of Biotechnology, University of Natural Resources and Applied Life Sciences, Vienna, AUSTRIA