

PREP

International Symposium,
Exhibit & Workshops on

Preparative and Process Chromatography,

Ion Exchange, Adsorption Processes & Related Separation Techniques

—PREP 2017 Preliminary Scientific Program—

[Click Here to Submit Abstracts for Poster Presentation](#)

(program as of 5-18-2017)

Training Workshops and Tutorials

Workshops and Tutorials are open to conference and non-conference participants. See details and pricing posted online at PREPsymposium.org. Must pre-register to attend. Each workshop/tutorial enrollment is limited to 30 participants.

Sunday, July 16	Workshops (See registration form for cost)	Instructors
9:00am - 1:00pm Commonwealth Hall A-1, 2nd floor	Fundamentals of Preparative Chromatography for Biomolecule Purification by Batch and Continuous Chromatography <i>Focus on biomolecule chromatography, stationary phases, binding capacity and selectivity, mass transfer, modeling, design for capture and resolution, multicolumn and continuous chromatography processes.</i>	Giorgio Carta, University of Virginia Alois Jungbauer, BOKU, Vienna Massimo Morbidelli, ETH Zurich
Sunday, July 16	Workshops (See registration form for cost)	Instructors
2:00pm - 6:00pm Commonwealth Hall A-1, 2nd floor	Fundamentals of Preparative Chromatography for Purification of APIs, Peptides, and Oligonucleotides by Batch Chromatography, SMB, and SFC <i>Focus on small molecule pharmaceuticals, APIs, chiral molecules, peptides, oligonucleotides, HPLC, column packing, gradient elution, overloaded chromatography, continuous chromatography, SMB, SFC, examples and industrial applications.</i>	Olivier Dapremont, AMPAC Fine Chemicals Geoffrey Cox, PIC Solution
Monday, July 17	Tutorial (See registration form for cost)	Instructors
7:00am - 8:25am Commonwealth Hall A-1, 2nd floor	Tips, Tricks, and Troubleshooting Analytical and Overloaded Prep Chromatography <i>Focus on analytical chromatography, overloaded chromatography, HPLC, SFC, examples of small molecules, APIs, peptides.</i>	Cecilia Mazza, AkzoNobel Qi (Tony) Yan, Pfizer, Inc.
Tuesday, July 18	Tutorial (See registration form for cost)	Instructor
7:00am - 8:25am Commonwealth Hall A-1, 2nd floor	Practical Concepts on Process Characterization and Validation of Biopharmaceuticals based on QbD Principles <i>Focus on Quality by Design, quality risk management, overall process control strategy, process characterization, application examples.</i>	Gisela Ferreira, MedImmune

Poster Competition

Poster presentations are a very important component of the PREP Symposia. In order to acknowledge their contribution to the field and high standards of the symposium, awards will be offered to distinguish the best poster contributions at PREP 2017. Posters will be evaluated on the basis of scientific content, clarity of presentation, and layout. Posters co-authored by members of the Scientific and Industrial Advisory Committees or by the Poster Judging Committee are eligible only if the main author and presenter of the poster is not a member on the above committees. Posters authored or co-authored by members of the Organizing Committee are not eligible for Best Poster Awards. However, should these posters be considered of sufficient quality to be among the top prize-winning entries, they will be given Honorable Mention. The Poster Judging Committee will have final say in the selection of the Prize Winners. At least two committee members will read each poster and top posters will be read by at least four committee members. If a poster author does not want his/her poster considered for a poster award, they must notify the Symposium Manager before 11:00 a.m. on Tuesday, July 18.

Presentation of awards to winners of the Best Poster Competition will take place at the end of Session 9 on Wednesday. The winners are encouraged to be present, but it is not mandatory to be present to win.

PREP Symposium Conference History

1985	Washington DC	2003	San Francisco, CA
1986	Washington DC	2004	Baltimore, MD
1987	Washington DC	2005	Philadelphia, PA
1989	Washington DC	2006	Washington DC
1991	Washington DC	2007	Washington DC
1993	Washington DC	2008	San Jose, CA
1994	Washington DC	2009	Philadelphia, PA
1995	Washington DC	2010	Philadelphia, PA
1996	Washington DC	2011	Cambridge, MA
1997	Washington DC	2012	Cambridge, MA
1998	Washington DC	2013	Boston, MA
1999	San Francisco, CA	2014	Boston, MA
2000	Washington DC	2015	Philadelphia, PA
2000	Washington DC	2016	Philadelphia, PA
2001	Washington DC	2017	Philadelphia, PA
2002	Washington DC		

Workshop 1: Sunday, July 16, at 9:00 am - 1:00 pm
Fundamentals of Preparative Chromatography for Biomolecule Purification
by Batch and Continuous Chromatography

Workshop registration is in addition to the symposium registration fee;
open to conference and non-conference participants; enrollment limited to 30 participants.
Location: Commonwealth Hall A-1, 2nd floor -- must pre-register/pay to attend

Focus: Biomolecule chromatography, stationary phases, binding capacity and selectivity, mass transfer, modeling, design for capture and resolution, multicolumn and continuous chromatography processes.

This workshop will focus on the theory and practice of biomolecule chromatography. Since mass transfer and the structure of the stationary phase influence deeply chromatographic performance, the main emphasis is on describing adsorption/desorption kinetics in single and multicomponent systems and determining the relationship between stationary phase properties and process performance. The latest advances in stationary phase developments will be reviewed along with methods for their experimental characterization. Design and optimization strategies for capture and resolution applications will be discussed including multicolumn and continuous bio-chromatography processes.

Topics: Adsorption equilibrium and transport in single and multicomponent systems; Stationary phases for small and large biomolecules; Design and optimization of batch processes for capture and high-resolution steps; Multicolumn and continuous bio-chromatography processes; Process validation.

Expert Instructors:

Giorgio Carta received his Ph.D. in Chemical Engineering from the University of Delaware in 1984. Since then he has been a professor in the Department of Chemical Engineering at the University of Virginia, where his research focuses on transport phenomena and bioseparations. He regularly organizes professional courses on various aspects of bioseparations, including a course on protein chromatography development and scale-up together with Alois Jungbauer.

Alois Jungbauer is the head of protein technology and downstream processing at the Department of Biotechnology of the University of Natural Resources and Applied Life Sciences in Vienna (Austria). For more than 20 years, Professor Jungbauer has worked in biochemical engineering, with a focus on bioseparation, where he has published widely and holds 15 patents. For over 10 years, he has organized a biennial professional course in protein chromatography focused on mass transfer, dispersion, and scale-up.

Massimo Morbidelli received his Laurea in Chemical Engineering at the Politecnico di Milano in 1977, and his Ph.D. in Chemical Engineering at the University of Notre Dame in 1986. After appointments as professor at the University of Cagliari (Italy) and at the Politecnico di Milano, since 1997 he is Professor of Chemical Reaction Engineering at the Institute for Chemical and Bioengineering at ETH Zurich (Switzerland). His research interests are in polymer reactions and reaction-separation processes based on continuous chromatography and in biomolecule purification with specific focus on therapeutic proteins and monoclonal antibodies. He is co-author of more than 300 papers, 11 international patents and 4 books. He serves as an associate editor of Industrial & Engineering Chemistry Research, and is a member of the scientific board of several international journals. He is the recipient of the 2005 R.H. Wilhelm Award in Chemical Reaction Engineering of the American Institute of Chemical Engineers.

Workshop 2: Sunday, July 16, at 2:00 - 6:00 pm

Fundamentals of Preparative Chromatography for Purification of APIs, Peptides, and Oligonucleotides by Batch Chromatography, SMB, and SFC

Workshop registration is in addition to the symposium registration fee;
open to conference and non-conference participants; enrollment limited to 30 participants.
Location: Commonwealth Hall A-1, 2nd floor -- must pre-register/pay to attend

Focus: Small molecules, APIs, peptides, oligonucleotides, chiral molecules, HPLC, column packing, gradient elution, overloaded chromatography, SFC, SMB, examples and industrial applications.

This workshop will focus on development of methods for the preparative purification of small molecules for the pharmaceutical industry. After an introduction of the theory, optimization and practice of prep HPLC, SMB and SFC for small molecule separations, the instructors will present practical approaches to the development of preparative separation through a series of examples. The attendees will learn valuable information and techniques to apply in the laboratory and at manufacturing scale to increase throughput and performance.

Topics: Prep HPLC batch - Theory, optimization and practice; SMB - Principle and technology; SMB - Examples and applications; SFC - Theory, equipment and examples.

Expert Instructors:

Olivier Dapremont received his Ph.D. on Chemical Engineering and Applied Chemistry from University of Paris on the development of continuous chromatography for the pharmaceutical industry. He has worked on the development of SMB technology since 1992. He is currently Executive Director of Process Technologies at AMPAC Fine Chemicals where his role encompasses the development of SMB separations using multiple SMB units ranging from 4.6 mm to 1 m in diameter as well as developing continuous processes for the manufacturing of APIs. He is coauthor of several publications and patents related to the use of SMB applications for the purification of small molecules.

Geoffrey Cox received his Ph.D. in Organic Chemistry from the University of Sheffield, England. Since then his career has been centered around chromatography, starting with preparative gas chromatography through introduction of HPLC to the premier Government analytical laboratory in the UK, development of bonded stationary phases and moving to preparative and industrial scale chromatography first with Du Pont and then in the mid-1980s as Director R&D with Prochrom. In 1997 he moved to Chiral Technologies, first in Europe before relocating to the USA as VP Technology, working in chiral separations. In March 2011 he started the US subsidiary of PIC Solution, the French SFC manufacturer, in order to expand the company's business into North America. He is author and coauthor of several publications and patents related to the use of chromatography for the purification of small molecules using multiple techniques.

Tutorial: Monday, July 17, at 7:00 - 8:25 am

Tips, Tricks, and Troubleshooting Analytical and Overloaded Prep Chromatography

Tutorial registration is in addition to the symposium registration fee;
open to conference and non-conference participants; enrollment limited to 30 participants.
Location: Commonwealth Hall A-1, 2nd floor; light breakfast will be provided.
Must pre-register/pay to attend.

Focus: Analytical chromatography, overloaded chromatography, HPLC, SFC, examples of small molecules, APIs, peptides

This workshop will focus on the practical aspects of analytical and preparative chromatography, scale-up, and how to overcome the challenges that the chromatographer encounters on a daily basis by using the tips and tricks provided.

Topics: Analytical and Preparative chromatography purpose, practical scaleup, issues with peak shape, considering the whole chromatographic system (equipment, column and software) as contributors to the final chromatographic result, troubleshooting tools for improved chromatographic performance.

Expert Instructors:

Cecilia Mazza has worked with small molecules, APIs, peptides and proteins for twenty five years, both in analytical as well as preparative chromatography. She is product manager and regional sales manager for Kromasil columns and bulk at AkzoNobel in Sweden.

Qi (Tony) Yan is currently working for Pfizer, Inc. (Groton, CT, USA) in the field of impurity isolation for structure elucidation in the department of pharmaceutical science. He has worked in pharmaceutical research and development in the area of chiral and achiral purifications, and impurity isolation for over 20 years.

Tutorial: Tuesday, July 18, at 7:00 - 8:25 am

Practical Concepts on Process Characterization and Validation of Biopharmaceuticals based on QbD Principles

Tutorial registration is in addition to the symposium registration fee;
open to conference and non-conference participants; enrollment limited to 30 participants.
Location: Commonwealth Hall A-1, 2nd floor; light breakfast will be provided.
Must pre-register/pay to attend.

Focus: This workshop will focus on the practical aspects of analytical and preparative chromatography, scale-up, and how to overcome the challenges that the chromatographer encounters on a daily basis by using the tips and tricks provided.

Topics: This interactive tutorial introduces principles of Quality by Design including preparation of risk assessments, design of experiments for process characterization, statistical data analysis, quality risk management and validation of biopharmaceutical processes. Topics: Quality by Design, quality risk management, overall process control strategy, process characterization, application examples.

Expert Instructor:

Gisela Ferreira received her Ph.D. in Chemical Engineering from the University of Maryland Baltimore County in 2001 and is currently Senior Scientist in the Process Biochemistry Group at MedImmune. Prior to joining MedImmune she held positions as Senior Scientist at Medarex in the downstream department. Dr. Ferreira has broad biotechnology experience and expertise in areas including process development for large-scale cGMP manufacture of biologics, recombinant biopharmaceutical purification (early and late stage development), QbD, technology transfer and scale-up.

Free Vendor Workshops Monday, July 17, 2017 @ 12:30-2:00 PM

12:30-2:00 PM **Workshop on Expanded Line of Chromatography Resins for Every Need, Commonwealth from Small Organic Biomolecules to Column Free Purification of Monoclonal Hall A-1 Antibodies, Sponsored by Purolite Life Sciences**
2nd floor *(light lunch will be provided)*
Must pre-register at the booth of Purolite Life Sciences by Monday @ 10:40 AM

12:30-2:00 PM **Workshop on Non-Invasive Investigation on the State of the Column during Commonwealth Cleaning-In-Place, Sponsored by DAISO Fine Chem USA, Inc.**
Hall A-2 *(light lunch will be provided)*
2nd floor *Must pre-register at the booth of DAISO Fine Chem USA, Inc. by Monday @ 10:40 AM*

12:30-2:00 PM **Workshop on Challenging Biomolecule Purifications Resolved with Innovative Tubman Room Selectivities, Sponsored by Bio-Rad Laboratories**
3rd floor *(light lunch will be provided)*
Must pre-register at the booth of Bio-Rad Laboratories by Monday @ 10:40 AM

Free Vendor Workshop Tuesday, July 18, 2017 @ 7:00-8:25 AM (Free workshop runs in parallel with the purchased Tuesday Tutorial)

7:00-8:25 AM **Workshop on Introducing Innovative Technologies for PREP Work Flows, Commonwealth Sponsored by Agilent Technologies**
Hall A-2 *(light breakfast will be provided)*
2nd floor *Must pre-register at the booth of Agilent Technologies by Monday @ 5:10 PM*

Free Vendor Workshops Tuesday, July 18, 2017 @ 12:30-2:00 PM

12:30-2:00 PM **Workshop on Address Bioburden Challenge and Enhance Productivity in mAb Commonwealth Processes with Improved Downstream Tools, Sponsored by GE Healthcare Life Sciences**
Hall A-1 *(light lunch will be provided)*
2nd floor *Must pre-register at the booth of GE Healthcare Life Sciences by Monday @ 5:10 PM*

12:30-2:00 PM **Workshop on How to Model, Simulate and Scale-up Your Chromatographic Commonwealth Processes, Sponsored by YPSO-FACTO**
Hall A-2 *(light lunch will be provided)*
2nd floor *Must pre-register at the booth of YPSO-FACTO by Monday @ 5:10 PM*

12:30-2:00 PM **Workshop on New Developments in Stationary Phases for Anthony Room Preparative Chromatography, Sponsored by AkzoNobel/Kromasil**
3rd floor *(light lunch will be provided)*
Must pre-register at the booth of AkzoNobel/Kromasil by Monday @ 5:10 PM

12:30-2:00 PM **Workshop on Increasing Productivity of Downstream Processes – Tubman Room Purification Tools for Even the Most Demanding Biotherapeutics, Sponsored by Thermo Fisher Scientific**
3rd floor *(light lunch will be provided)*
Must pre-register at the booth of Thermo Fisher Scientific by Monday @ 5:10 PM

Preliminary List of Sponsors, Exhibitors, Media Partners

Ace Glass Inc.	Knauer
Agilent Technologies	Lab Bulletin
AkzoNobel/Kromasil	Lab Compare
American Laboratory	Labomatic Instruments AG
American Pharmaceutical Review	LCGC
AMPAC Fine Chemicals	MedImmune
Bioanalysis Zone	Merck
BioProcessing Journal	NOVASEP
Bio-Rad Laboratories	Orochem Technologies
Biotage	Pfizer
Bristol-Myers Squibb	Phenomenex
Chromatography Today	PIC Solution Inc.
DAISO Fine Chem USA, Inc.	Purolite Life Sciences
Essential Life Solutions & emp Biotech	Quantum Analytics
GE Healthcare Life Sciences	Sartorius Stedim Biotech
Genentech	SelectScience.net
GENews	separationsNOW
Gilson	Separation Science
Innovations in Pharmaceutical Technology, IPT	SP Scientific-Genevac
International Labmate	Technology Networks
ITOCHU Chemicals America	The Analytical Scientist
JNC America	Thermo Fisher Scientific
JSR Life Sciences	YMC America, Inc.
Kaneka	YPSO-FACTO

9:00 AM - 1:00 PM
Commonwealth
Hall A-1, 2nd floor

Sunday Workshop 1: Fundamentals of Preparative Chromatography for Biomolecule Purification by Batch and Continuous Processes

This workshop will focus on the theory and practice of biomolecule chromatography. Since mass transfer and the structure of the stationary phase influence deeply chromatographic performance, the main emphasis is on describing adsorption/desorption kinetics in single and multicomponent systems and determining the relationship between stationary phase properties and process performance. The latest advances in stationary phase developments will be reviewed along with methods for their experimental characterization. Design and optimization strategies for capture and resolution applications will be discussed including multicolumn and continuous bio-chromatography processes. See details and pricing at PREPsymposium.org. Open to conference and non-conference participants. Enrollment limited to 30 participants. Must pre-register to attend.

2:00 PM - 6:00 PM
Commonwealth
Hall A-1, 2nd floor

Workshop 2: Fundamentals of Preparative Chromatography for Purification of APIs, Peptides, and Oligonucleotides by Batch Chromatography, SMB, and SFC

This workshop will focus on development of methods for the preparative purification of small molecules for the pharmaceutical industry. After an introduction of the theory, optimization and practice of prep HPLC, SMB and SFC for small molecule separations, the instructors will present practical approaches to the development of preparative separation through a series of examples. The attendees will learn valuable information and techniques to apply in the laboratory and at manufacturing scale to increase throughput and performance. See details and pricing at PREPsymposium.org. Open to conference and non-conference participants. Enrollment limited to 30 participants. Must pre-register to attend.

1:30 - 5:30 PM

Exhibitor Registration Only -- to obtain badge required to set up booth

6:00 - 7:30 PM

Symposium Registration Open for Conferees

Location: Commonwealth Hall Foyer, 2nd floor

6:00 - 7:30 PM

Grand Opening of the Exhibition & Welcome Reception

Location: Millennium Hall, 2nd floor

Open to all conference participants; conference name badge is required for entry.

Monday, July 17, 2017

7:15 AM **Symposium Registration Open**
Location: Commonwealth Hall Foyer, 2nd floor

10:15 AM - 5:15 PM **Exhibition Open in Millennium Hall**, 2nd floor

Monday Tutorial

Tutorial registration is in addition to the symposium registration fee; open to conference and non-conference participants; light breakfast included; enrollment limited to 30 participants; must pre-register/pay to attend.

Location: Commonwealth Hall A-1, 2nd floor

7:00 AM - 8:25 AM
*Commonwealth
Hall A-1, 2nd floor*

Tutorial on Tips, Tricks, and Troubleshooting Analytical and Overloaded Prep Chromatography

This workshop will focus on the practical aspects of analytical and preparative chromatography, scale-up, and how to overcome the challenges that the chromatographer encounters on a daily basis by using the tips and tricks provided.

See details and pricing at PREPsymposium.org. Open to conference and non-conference participants. Must pre-register to attend.

Monday Welcome and Opening Remarks

Location: Commonwealth Hall C/D, 2nd floor

8:25 - 8:30 AM

Welcome and Opening Remarks.

Giorgio Carta, University of Virginia, Charlottesville, VA, USA

1. Monday Keynote Session:

Industrial Case Studies in Protein Chromatography

Session Chair: Alan Hunter, MedImmune

Location: Commonwealth Hall C/D, 2nd floor

8:30 AM

A Keytruda Story: Lightening Speed from Development to Commercialization, Challenges and Successes. Sunitha Kandula, David Roush, Nihal Tugcu, Merck, Kenilworth, NJ, USA

8:50 AM

Separation Challenges and Strategies for the Manufacture of Homogenous Antibody-Drug Conjugates. Michaela Wendeler, MedImmune, Gaithersburg, MD, USA

9:10 AM

Chromatography in the Crosshairs: Intensifying Effectiveness and Managing Costs in Biopharmaceutical Manufacturing. Lakshmi Madhavan, Nick Levy, Andre Dumetz, Chris Gerberich, Lee Bink, Sophie Russell, Bob Scott, Will Lewis, Cindy Jung, Jessica Molek, Hiren Ardeshta, Gerald Terfloth, Kent Goklen, GlaxoSmithKline R&D, King of Prussia, PA, USA

9:30 AM

Determining Mechanisms of Yield Loss during Monoclonal Antibody Capture via Structural Characterization of the Stationary Phase. James Angelo, Chao Huang, Xuankuo Xu, Sanchayita Ghose, Zhengjian Li, Bristol-Myers Squibb, Devens, MA, USA

9:50 AM

Case Study: Clearance of an Immunogenic Host Cell Protein Impurity in a CHO-Derived Biotherapeutic Leading to a Standard Purification Approach. Susan Fisher, Benjamin Tran, Genentech, South San Francisco, CA, USA

10:10-10:40 AM

Break in Millennium Exhibition Hall

Monday, July 17, 2017

2. Monday Session: Mechanistic Understanding and Modeling - I

Session Chair: David Roush, Merck & Co., Inc.

Location: Commonwealth Hall C/D, 2nd floor

- 10:40 AM **Characterization of Heterogeneous Protein Adsorption on Depth Filters.** Ohnmar Khanal¹, Nripen Singh², Steven Traylor², Xuankuo Xu², Abraham Lenhoff¹, ¹University of Delaware, Newark, DE, USA; ²Bristol-Myers Squibb, Devens, MA, USA
- 11:00 AM **A Protein Surface Property Perspective on Multimodal Chromatography: From Fundamental Understanding to Predictive Tools.** Julie Robinson, Steven Cramer, Rensselaer Polytechnic Institute, Troy, NY, USA
- 11:20 AM **A New Binding Model for Complex Elution Behavior of mAb under High Loading Conditions on Cation Exchange Tentacle Resins.** Juliane Diedrich¹, William Heymann¹, Samuel Leweke¹, Stephen Hunt², Robert Todd², Christian Kunert³, Will Johnson³, Eric von Lieres¹, ¹Forschungszentrum Juelich, Juelich, GERMANY; ²KBI Biopharma, Boulder, CO, USA; ³AMGEN, Cambridge, MA, USA
- 11:40 AM **Calibration of Mechanistic Chromatography Models using Artificial Intelligence.** Gang Wang¹, Till Briskot¹, Tobias Hahn², Pascal Baumann¹, Jurgen Hubbuch¹, ¹KIT, Karlsruhe, GERMANY; ²GoSilico GmbH, Karlsruhe, GERMANY
- 12:00 PM **Liquid-liquid Phase Separation Causes High Turbidity and Pressure during Low pH Elution Process in Protein A Chromatography.** Haibin Luo, Nacole Lee, Xiangyang Wang, Yuling Li, Albert Schmelzer, Alan Hunter, Timothy Pabst, William Wang, MedImmune, Gaithersburg, MD, USA

Monday Mixer in the Exhibition Hall

Location: Millennium Hall, 2nd floor - Mixer includes light lunch in the Exhibition Hall

- 12:20-3:20 PM **Break, Exhibits, Mixer, Posters**

Monday, July 17, 2017

Monday Free Vendor Workshops

Must pre-register at the sponsor's booth to attend; light lunch will be provided

12:30-2:00 PM **Workshop on Expanded Line of Chromatography Resins for Every Need, Commonwealth from Small Organic Biomolecules to Column Free Purification of Monoclonal Hall A-1 Antibodies, Sponsored by Purolite Life Sciences**

(light lunch will be provided)

Must pre-register at the booth of Purolite Life Sciences by Monday @ 10:40 AM

12:30-2:00 PM **Workshop on Non-Invasive Investigation on the State of the Column during Commonwealth Cleaning-In-Place, Sponsored by DAISO Fine Chem USA, Inc. Hall A-2**

(light lunch will be provided)

Must pre-register at the booth of DAISO Fine Chem USA, Inc. by Monday @ 10:40 AM

Diabetes API purification processes are the biggest RP silica-based HPLC applications. The diabetes API peptides are prone to self-aggregation and fibrillation. The fibrillate renders the expensive columns useless too soon needing to discard the stationary phase. Desperate efforts are made to regenerate/clean the silica. However, only the most aggressive NaOH wash does the trick and cleans off the fibrillated peptides from the top of the column. Do we clean the column enough by following the CIP SOP or are we "over-cleaning" causing further damage? Here we present newly developed analytical tests and make possible the optimization of the CIP step.

12:30-2:00 PM **Workshop on Challenging Biomolecule Purifications Resolved with Innovative Tubman Room Selectivities, Sponsored by Bio-Rad Laboratories 3rd floor**

(light lunch will be provided)

Must pre-register at the booth of Bio-Rad Laboratories by Monday @ 10:40 AM

MONDAY POSTER SESSION 1

Poster Session Co-anchors: Dorota Antos, Rzeszow University of Technology, Poland and Attila Felinger, University of Pecs, Hungary

2:00-3:15 PM **POSTER SESSION 1 - Sponsored by Bristol-Myers Squibb**
Location: Millennium Exhibition Hall, 2nd floor

3A. Monday Parallel Session: Bioprocesses

Session Chair: Andre Dumetz, GlaxoSmithKline

Location: Commonwealth Hall C/D, 2nd floor

- 3:20 PM **pH Calculations in Physico-chemical Modeling of Bioprocess Systems – Concepts, Applications and Opportunities.** Natraj Ram, AbbVie, Worcester, MA, USA
- 3:40 PM **Effects of Antibody Disulfide Bond Reduction on Purification Process Performance and Final Drug Substance Stability.** Wai Keen Chung¹, Brian Russell¹, Yanhong Yang¹, Michael Handlogten², Suzanne Hudak¹, Mingyan Cao¹, Jihong Wang¹, David Robbins¹, Sanjeev Ahuja¹, Min Zhu³, ¹MedImmune, Gaithersburg, MD, USA; ²Macrogenics, Rockville, MD, USA; ³Boehringer Ingelheim, Fremont, CA, USA
- 4:00 PM **Downstream Process Development Challenges and Mitigation Strategies for a Novel Therapeutic Protein during a Clinical Campaign.** Chris Furcht, Rob Collatos, Russell Katz, Keith Selvitelli, Tate Healy, Biogen, Cambridge, MA, USA
- 4:20 PM **Linking Single Pass Tangential Flow Filtration with Affinity and Anion Exchange Chromatography for Intensified mAb Processing.** Juan Castano¹, Thomas Elich¹, Herb Lutz¹, Elizabeth Goodrich², Nicolas Laroudie³, Mathilde Bourguignat⁴, Alejandro Becerra-Arteaga¹, ¹EMD Millipore Corporation, Billerica, MA, USA; ²EMD Millipore Corporation, Molsheim, FRANCE; ³Millipore S.A.S, Molsheim, FRANCE; ⁴Millipore S.A.S, Billerica, MA, USA
- 4:40-5:10 PM **Break in Millennium Exhibition Hall, 2nd floor**

3B. Monday Parallel Session: Stationary Phases for Bio-Applications

Session Chair: Christian Frech, University of Applied Sciences, Mannheim

Location: Commonwealth Hall B, 2nd floor

- 3:20 PM **Continuous Manufacturing of Agarose Beads for Design of Protein A Chromatography Resins.** Hans J. Johansson, Purolite, Llantrisant, UK
- 3:40 PM **Polishing of mAb Charge Variants using Preparative Ion Exchange and Multimodal Chromatography.** Anna Gronberg, Bengt Westerlund, Tomas Bjorkman, Lena Karf, Anders Ljunglof, Eggert Brekkan, GE Healthcare, Uppsala, SWEDEN
- 4:00 PM **Development of a Novel Anionic Mixed Mode Resin by Optimization of a Primary Amine Surface Coating by Controlled Hydrophobic Substitution on a Stable Cellulose Based Bead.** Yoshihiro Matsumoto¹, Yasuto Umeda¹, Malcolm G. Pluskal², Shigeyuki Aoyama¹, ¹JNC Corporation, Yokohama, JAPAN; ²JNC America, Littleton, MA, USA
- 4:20 PM **Innovative Hydrophobic Interaction Chromatography (HIC) Resins for Next Generation Molecule Challenges.** Moira Lynch, Jinsong Liu, James Molinari, Dave Thomas, John Li, Kelly Flook, Andy Tomlinson, Shelly Parra, Thermo Fisher Scientific, Bedford, MA, USA
- 4:40-5:10 PM **Break in Millennium Exhibition Hall, 2nd floor**

Monday, July 17, 2017

4A. Monday Parallel Session: Protein A and Affinity Chromatography

Session Chair: Rainer Hahn, BOKU Vienna

Location: Commonwealth Hall C/D, 2nd floor

- 5:10 PM **Thermodynamic Properties of Staphylococcal Protein A – Antibody Interaction.** Walpurga Krepper¹, Peter Satzer¹, Alois Jungbauer², ¹BOKU Vienna, Vienna, AUSTRIA; ²BOKU Vienna and Austrian Center of Industrial Biotechnology (ACIB), Vienna, AUSTRIA
- 5:30 PM **Improving the Selectivity and Robustness of Protein A Chromatography with PEGylated Ligands.** Justin Weinberg¹, Shaojie Zhang², Allison Kirkby¹, Enosh Shachar¹, Giorgio Carta², Todd Przybycien¹, ¹Carnegie Mellon University, Pittsburgh, PA, USA; ²University of Virginia, Charlottesville, VA, USA
- 5:50 PM **Protein A Chromatography as Capture Step for Antibody Fragments: Mechanism of Interaction and Case Study.** Alpana Naresh¹, Gerald Platteau², Guido Stroehlein², Vaiva Gaspariunaite³, Cecile Vincke³, Yann Sterckx³, Serge Muyldermans³, Masa Nagaya¹, ¹JSR Life Sciences JSR Micro Inc., Sunnyvale, CA, USA; ²JSR Life Sciences – JSR Micro NV, Leuven, BELGIUM; ³Vrije Universiteit Brussel (VUB), Elsene, BELGIUM
- 6:10 PM **An Expanded use for an Industry Stalwart: Leveraging Affinity Purification to Select Product Critical Quality Attributes.** Warren Kett, Avitide Inc., Lebanon, NH, USA
- 6:30-7:30 PM **Reception in Millennium Exhibition Hall, 2nd floor**

4B. Monday Parallel Session: Stationary Phases for RP HPLC

Session Chair: Cecilia Mazza, AkzoNobel

Location: Commonwealth Hall B, 2nd floor

- 5:10 PM **Chromatographic Materials for Enhancing the Productivity and Resolution of High Performance Liquid Chromatography Separations using Modern Chromatographic Particles.** Ernest Sobkow, YMC, Allentown, PA, USA
- 5:30 PM **Process Scale Purification of Synthetic Peptides by HPLC.** Marc Jacob¹, Tivadar Farkas¹, Guido Krautz², ¹Phenomenex, Torrance, CA, USA; ²Phenomenex, Aschaffenburg, GERMANY
- 5:50 PM **Enhanced Peptide and Oligonucleotide Purification via Novel Orthogonal, Doped Reverse Phase Chromatography.** Timothy O`Mara¹, Joachim Kinkel², Juergen Machielse³, Andrea Wild³, ¹Itochu Chemicals America Inc., White Plains, NY, USA; ²TU Nuerenberg, Nuerenberg, GERMANY; ³Zeochem AG, Uetikon am See, SWITZERLAND
- 6:10 PM **RP-HPLC Analysis of Amphiphilic Oxime Linker Synthesis and DM1-oxime Conjugation for ADC.** Hyunmin Ryu, Pil Seok Chae, E. K. Lee, Hanyang University, Ansan, SOUTH KOREA
- 6:30-7:30 PM **Reception in Millennium Exhibition Hall, 2nd floor**

Tuesday, July 18, 2017

7:30 AM

Symposium Registration Open

Location: Commonwealth Hall Foyer, 2nd floor

9:00 AM - 3:30 PM

Exhibition Open in Millennium Hall, 2nd floor

Tuesday Tutorial

Tutorial registration is in addition to the symposium registration fee; open to conference and non-conference participants; light breakfast included; enrollment limited to 30 participants; must pre-register/pay to attend.

Location: Commonwealth Hall A-1, 2nd floor

7:00-8:25 AM

Tutorial on Practical Concepts on Process Characterization and Validation of Commonwealth Biopharmaceuticals based on QbD Principles

Hall A-1
2nd floor

This interactive tutorial introduces principles of Quality by Design including preparation of risk assessments, design of experiments for process characterization, statistical data analysis, quality risk management and validation of biopharmaceutical processes. Topics: Quality by Design, quality risk management, overall process control strategy, process characterization, application examples.

See details and pricing at PREPsymposium.org. Open to conference and non-conference participants. Must pre-register to attend.

Tuesday Free Vendor Workshop

Must pre-register at the sponsor's booth to attend; light breakfast will be provided

Location: Commonwealth Hall A-2, 2nd floor

7:00-8:25 AM

Workshop on Introducing Innovative Technologies for PREP Work Flows, Commonwealth Sponsored by Agilent Technologies

Hall A-2
2nd floor

(light breakfast will be provided)

Must pre-register at the booth of Agilent Technologies by Monday @ 5:10 PM

Discover how you can improve your workflow utilizing Agilent's tailor-made, high-efficiency LC purification solutions ranging from analytical scale to preparative scale for purification of your product. Learn how you will benefit from the completely new comprehensive portfolio of state-of-the-art LC purification instruments, which builds on 40+ years of technology leadership, offering you scalable LC purification solutions that meet your needs and budget. Agilent's Technical team will be available to answer your questions.

5. Tuesday Keynote Session: Preparative Chromatography in Drug Discovery, Development, and Manufacture

Session Chair: Qi (Tony) Yan, Pfizer

Location: Commonwealth Hall C/D, 2nd floor

- 8:30 AM **Preparative Reversed-phase HPLC Purification to Support GLP/GMP Deliveries.** Jimmy DaSilva, Fuh-Rong Tsay, Lisa Frey, Mirlinda Biba, Ingrid Mergelsberg, Merck & Co. Inc., Rahway, NJ, USA
- 8:50 AM **Modern Technology Platform based on Supercritical Fluid Chromatography for Small Molecules Drug Discovery.** Gerard Rosse, Dart NeuroScience, San Diego, CA, USA
- 9:10 AM **Column Loadability of Charged Versus Uncharged Forms of Ionizable Compounds in Preparative Reverse Phase Chromatography.** Jan Szeliga, Pfizer Inc., Groton, CT, USA
- 9:30 AM **Beyond UV - Detection of "Invisible" Compounds in Preparative and Production HPLC.** Markus Juza, Corden Pharma Switzerland, Liestal, SWITZERLAND
- 9:50 AM **Enantiomer Separations of Amino Acids and Derivatives on Immobilized Polysaccharide Phases with Extended Range of Solvents using Supercritical Fluid Chromatography.** Qi Yan, Frank Riley, Pfizer Inc., Groton, CT, USA
- 10:10-10:40 AM **Break in Millennium Exhibition Hall**

6. Tuesday Keynote Session: Continuous and Integrated Processing - I

Session Chair: Igor Quinones-Garcia, Mersana Therapeutics

Location: Commonwealth Hall C/D, 2nd floor

- 10:40 AM **Perspective on Continuous Manufacturing for Pharmaceuticals.** Lois Ann Beaver, LAB Enterprise, Chevy Chase, MD, USA
- 11:00 AM **Dynamic Process Control of Twin-column Periodic Counter-current Chromatography Processes.** Lars Aumann^{1,2}, Thomas Muller-Spath^{1,2}, Daniel Baur¹, Michael Bavand², Massimo Morbidelli¹, ¹ETH Zurich, Zurich, SWITZERLAND; ²ChromaCon, Zurich, SWITZERLAND
- 11:20 AM **Real-time Monitoring of Quantity and Purity of Fibroblast Growth Factor-2 during the Chromatographic Capture Step.** Dominik Georg Sauer, Michael Melcher, Friedrich Leisch, Nicole Walch, Theresa Scharl-Hirsch, Alois Jungbauer, Astrid Durauer, Austrian Center of Industrial Biotechnology, Vienna, AUSTRIA
- 11:40 AM **Rapid in Silico Design of Integrated Downstream Bioprocesses for Efficient Removal of Impurities.** Nicholas Vecchiarello, Chaz Goodwine, Steven Timmick, Steven Cramer, Rensselaer Polytechnic Institute, Troy, NY, USA
- 12:00 PM **Cost Modeling of an Integrated, Continuous Downstream mAb Platform.** Jonathan Hummel, Mark Schofield, Pall Life Sciences, Westborough, MA, USA

Tuesday, July 18, 2017

Tuesday Mixer in the Exhibition Hall

Location: Millennium Hall, 2nd floor - Mixer includes light lunch in the Exhibition Hall

12:20-3:20 PM **Break, Exhibits, Mixer, Posters**

Tuesday Free Vendor Workshops

Must pre-register at the sponsor's booth to attend; light lunch will be provided

12:30-2:00 PM **Workshop on Address Bioburden Challenge and Enhance Productivity in mAb Commonwealth Processes with Improved Downstream Tools, Sponsored by GE Healthcare Life Sciences**

Hall A-1 *(light lunch will be provided)*

2nd floor Must pre-register at the booth of GE Healthcare Life Sciences by Monday @ 5:10 PM

Bacteria and their byproducts can negatively affect the safety and potency of a biopharmaceutical drug. At a minimum, bioburden contaminations lead to reduced productivity as a result of lost batches and/or deviation investigations. Striving towards a bioburden-free process, biopharmaceutical companies and their suppliers must collaborate. This workshop will focus on the commitment from GE Healthcare and will describe the continuous improvements in downstream bioprocess equipment and consumables, further Protein A resin development to withstand high NaOH concentrations and investigation of an oxidizing agent for sanitization.

12:30-2:00 PM **Workshop on How to Model, Simulate and Scale-up Your Chromatographic Commonwealth Processes, Sponsored by YPSO-FACTO**

Hall A-2 *(light lunch will be provided)*

2nd floor Must pre-register at the booth of YPSO-FACTO by Monday @ 5:10 PM

ChromWorks© is the chromatography simulator made by users for users to help develop downstream process. Through this user-friendly tool, you can understand, scale-up, simulate and assess your processes. We see how to get the most from your data to deepen process understanding and design efficient units. Based on typical therapeutic proteins production stream, affinity, ion-exchange and size-exclusion chromatography are modeled. Making use of our toolbox to estimate physico-chemical parameters, we show how to use these to simulate various processes including single-column, SMB and template-free-user-defined systems. It will be shown how computer-based process development not only accelerates process design but also helps reducing the experimental effort.

12:30-2:00 PM **Workshop on New Developments in Stationary Phases for Preparative Chromatography, Sponsored by AkzoNobel/Kromasil**

Anthony Room *(light lunch will be provided)*

3rd floor Must pre-register at the booth of AkzoNobel/Kromasil by Monday @ 5:10 PM

Kromasil materials are used in a variety of applications for the purification of low molecular weight pharmaceuticals, peptides and larger molecules. One of the key benefits of using Kromasil in the pharmaceutical and biotechnology industries is that Kromasil is available in a wide range of particle sizes in bulk and as prepacked columns, so the methods developed in the early stages of discovery can easily be transferred and scaled up for development and manufacturing, saving critical resources and time to market. The unique high chemical and mechanical stability of Kromasil stationary phases plus ample portfolio allow users to run chromatography under very wide range mobile phase conditions according to the sample characteristics. The Separation Products team responsible for Kromasil products innovates and makes new products available according to chromatographers' needs; during this workshop we will share new developments in stationary phases for purification as well as key examples.

Tuesday Free Vendor Workshops (continued)

Must pre-register at the sponsor's booth to attend; light lunch will be provided

12:30-2:00 PM **Workshop on Increasing Productivity of Downstream Processes – Purification Tools for Even the Most Demanding Biotherapeutics, Sponsored by Thermo Fisher Scientific**
Tubman Room
3rd floor

(light lunch will be provided)

Must pre-register at the booth of Thermo Fisher Scientific by Monday @ 5:10 PM

The manufacture of complex biotherapeutics requires novel purification strategies without compromising the economic aspects of the process. The POROS® and CaptureSelect™ affinity resins offer unique performance attributes and drive benefits to downstream processing. CaptureSelect ligand technology addresses protein purification challenges and provides a platform approach by introducing a highly selective capture step. These affinity resins help enable reduced time-to-market, increased purity and yield, and reduced cost of goods for biopharmaceutical drug development. Here we present our unique purification solutions, designed for the discovery and manufacturing of therapeutic molecules and vaccines, including challenging proteins, antibodies, antibody fragments and viral vectors.

TUESDAY POSTER SESSION 2

Poster Session Co-anchors: Dorota Antos, Rzeszow University of Technology, Poland and Attila Felinger, University of Pecs, Hungary

2:00-3:15 PM **POSTER SESSION 2 - Sponsored by Bristol-Myers Squibb**

Location: Millennium Exhibition Hall, 2nd floor

7A. Tuesday Parallel Session: Mechanistic Understanding and Modeling - II

Session Chair: Melody Schmidt, Genentech

Location: Commonwealth Hall C/D, 2nd floor

3:20 PM **Moment Analysis Technique for Scaling-up Protein Chromatography.** Wojciech Marek¹, Astrid Duerauer², Alois Jungbauer², Wojciech Piatkowski¹, Dorota Antos¹,
¹Rzeszow University of Technology, Rzeszow, POLAND; ²University of Natural Resources and Life Sciences, Vienna, AUSTRIA

3:40 PM **Restricted Diffusion of Proteins in Multicomponent Mixtures.** Alexander Matschweiger¹, Preston Fuks², Giorgio Carta², Rainer Hahn¹, ¹BOKU Vienna, Vienna, AUSTRIA; ²University of Virginia, Charlottesville, VA, USA

4:00 PM **Charge Variants Separation of mAbs in Cation Exchange Chromatography: Comparison of Mechanistic Modelling based on the Donnan (DIX) and Steric Mass Action (SMA) Equilibrium.** Felix Wittkopp¹, Felix Selinger¹, Romas Skudas², Michael Schulte², Christian Frech¹, ¹University of Applied Sciences, Mannheim, GERMANY; ²Merck KGaA, Darmstadt, GERMANY

4:20 PM **Protein A Resin Lifetime Study by Evaluating Protein A Resin Performance during Continuous Capture Operation using a Model based Approach.** Ketki Behere¹, Bumjoon Cha¹, Kathleen Mihlbachler², Seongkyu Yoon¹, ¹University of Massachusetts, Lowell, MA, USA; ²LEWA-Nikkiso America Inc., Devens, MA, USA

4:40-4:50 PM **Intermission**

7B. Tuesday Parallel Session: Supercritical Fluid Chromatography

Session Chair: Lois Ann Beaver, LAB Enterprises and Jonathan Edelman, Wheaton
Location: Commonwealth Hall B, 2nd floor

- 3:20 PM **Fundamental Investigations of Peak Distortions in Preparative SFC Separation of Basic Components Accounting for Both Additive and Co-Solvent.** Emelie Glenne¹, Jorgen Samuelsson¹, Hanna Leek², Magnus Klarqvist², Torgny Fornstedt¹, ¹Karlstad University, Karlstad, SWEDEN; ²AstraZeneca R&D, Molndal, SWEDEN
- 3:40 PM **Preparative Supercritical Fluid Chromatography in Support of Drug Discovery and Development at Merck.** Mirlinda Biba, Jinchu Liu, Judy Morris, Jimmy DaSilva, Merck, Rahway, NJ, USA
- 4:00 PM **Sample Introduction in Preparative SFC.** Geoffrey Cox, PIC Solution Inc., Media, PA, USA
- 4:20 PM **The Development of a Chemical Test Mixture to Track Column Performance and Stationary Phase Suitability for Optimized Preparative SFC Chromatography.** Matthew Przybyciel, ES Industries, West Berlin, NJ, USA
- 4:40-4:50 PM **Intermission**

**8A. Tuesday Parallel Session:
Column and Molecule-Surface Interaction Characterization**

Session Chair: Gisela Ferreira, MedImmune
Location: Commonwealth Hall C/D, 2nd floor

- 4:50 PM **In situ Visualization of the Packing Structure by X-ray Nanotomography and Modeling of Chromatographic Efficiency by Computational Fluid Dynamics.** Susanne Schweiger¹, Rupert Tscheliessnig¹, Tim Schroeder², Alois Jungbauer³, ¹Austrian Centre of Industrial Biotechnology, Vienna, AUSTRIA; ²Repligen, Weingarten, GERMANY; ³BOKU Austrian Centre of Industrial Biotechnology, Vienna, AUSTRIA
- 5:10 PM **Effects of Resin Architecture and Protein Size on Protein Distribution in Ion-exchange Media.** Stijn Koshari, Norman Wagner, Abraham Lenhoff, University of Delaware, Newark, DE, USA
- 5:30 PM **Thermodynamic Analysis of the Adsorption of Proteins onto Ion Exchange Chromatography Resins: Basic Proteins – Cation Exchange Chromatography Gels.** Joao Cardoso, Noriko Yoshimoto, Shuichi Yamamoto, Yamaguchi University, Ube, JAPAN
- 5:50 PM **Overloading Studies of Zwitterionic Chromatographic Columns.** Attila Felinger, University of Pecs, Pecs, HUNGARY
- 6:10 PM **Pause**

Tuesday, July 18, 2017

8B. Tuesday Parallel Session: Natural Products Applications and CPC

Session Chair: Jose Paulo Mota, LAQV@REQUIMTE, Universidade de NOVA de Lisboa
Location: Commonwealth Hall B, 2nd floor

- 4:50 PM **Overcoming the Limitations for the Production of Pure Biomolecules using Simulated Moving Bed Chromatography.** Anil Oroskar, Babu Antharavally, Pravin Ninawe, Rahuljit Pla, Asha Oroskar, Orochem Technologies, Naperville, IL, USA
- 5:10 PM **Model-based Design of Ternary Separations with Centrifugal Partition Chromatography.** Raena Morley, Johannes Goll, Mirjana Minceva, Technical University of Munich, Freising, GERMANY
- 5:30 PM **New Prep Countercurrent Chromatograph with the Spiral Tubing Support and Mixer-Settler Rotors.** Martha Knight¹, Thomas Finn¹, Rodrigo Lazo-Portugal¹, Ben Feldman², Eric Cabahug², ¹CC Biotech LLC, Rockville, MD, USA; ²Prototype Productions Inc., Ashburn, VA, USA
- 5:50 PM **Improvement Opportunities for the Purification of Taxane Compounds.** Dora Rutterschmid, Zsolt Kovacs, Zsolt Misek, Ying Hou Guan, Laszlo Nemeth, Laszlo Lorantfy, RotaChrom, Dabas, HUNGARY
- 6:10 PM **Pause**

Wednesday, July 19, 2017

- 7:15 AM **Symposium Registration Open**

9. Wednesday Keynote Session: Continuous and Integrated Processing - II

Session Chair: Olivier Dapremont, AMPAC Fine Chemicals
Location: Millennium Hall, 2nd floor

- 8:30 AM **8-Zone Simulated Moving Bed Chromatography: Setup Techniques.** Francisco Vitor Santos da Silva¹, Andreas Seidel-Morgenstern², ¹Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, GERMANY; ²Otto von Guericke University, Magdeburg, GERMANY
- 8:50 AM **Model-based Design and Operation of Simulated Moving Bed Reactor for the Production of Glycol Ether Acetate: Esterification vs. Transesterification.** Shan Tie¹, Balamurali Sreedhar², Jungmin Oh¹, Megan Donaldson², Alfred Schultz², Timothy Frank², Andreas Bommarius¹, Yoshiaki Kawajiri¹, ¹Georgia Tech, Atlanta, GA, USA; ²The Dow Chemical Company, Midland, MI, USA
- 9:10 AM **Recovery of Sugars from Lignocellulosic Hydrolysates by Continuous Ion Exclusion Chromatography.** Gabriele Lodi¹, Giuseppe Storti², Laura Annamaria Pellegrini¹, Massimo Morbidelli², ¹Politecnico di Milano, Milano, ITALY; ²ETH Zurich, Zurich, SWITZERLAND

9. Wednesday Keynote Session: Continuous and Integrated Processing - II (continued)

Session Chair: Olivier Dapremont, AMPAC Fine Chemicals

Location: Millennium Hall, 2nd floor

- 9:30 AM **On the use of Single-column Chromatography with Recycle Lag to Reproduce the Behavior of Three- and Four-column Simulated Countercurrent Chromatography.** Abimaelle Chiberio, Jose Paulo Mota, LAQV@REQUIMTE, Universidade NOVA de Lisboa, Monte de Caparica, PORTUGAL
- 9:50 AM **Recycling Chromatography Process to Unlock Challenging Separation Problems.** Fabrice Gritti, Mike Leal, Martin Gilar, Waters Corporation, Milford, MA, USA
- 10:10-10:20 AM **Presentation of Awards to Winners of the Best Poster Competition**
- 10:20-10:40 AM **Break**

10. Wednesday Session: Monoliths and Alternatives to Packed Beds

Session Chair: Milton Hearn, Monash University

Location: Millennium Hall, 2nd floor

- 10:40 AM **Monolithic Chromatography as an Alternative for the Separation of High-value Biomolecules.** Mirna Gonzalez-Gonzalez, Jose Gonzalez-Valdez, Karla Mayolo-Deloisa, Marco Rito-Palomares, Tecnologico de Monterrey, Monterrey, MEXICO
- 11:00 AM **Efficient High Throughput Separations of IgG using a Protein A Immobilized Spongy Monolith in Liquid Chromatography.** Takuya Kubo¹, Kei Kubota², Naoki Nishimura¹, Tetsuya Tanigawa³, Toyohiro Naito¹, Koji Otsuka¹, ¹Kyoto University, Kyoto, JAPAN; ²Daiichi Sankyo Co. Ltd., Hiratsuka, JAPAN; ³Chemco Scientific Co. Ltd., Osaka, JAPAN
- 11:20 AM **Triply Periodic Minimal Surface Structures in 3D-printed Chromatography Columns.** Conan Fee¹, Anne Gordon¹, Tim Huber¹, Simone Dimartino², ¹University of Canterbury, Christchurch, NEW ZEALAND; ²University of Edinburgh, Edinburgh, UK
- 11:40 AM **mAb Purification Processes Innovation using Novel Chromatographic Materials and Ligands.** Alexei Voloshin, 3M Company, St. Paul, MN, USA
- 12:00PM **Protein A-modified Capillary-channeled Polymer Fibers for Antibody Isolation: From the Analytical PAT Quantification to the Preparative Scale.** R. Kenneth Marcus, Hung Trang, Clemson University, Clemson, SC, USA
- 12:20-2:00 PM **Break**

11. Wednesday Session: Virus, VLPs, and Cells Applications

Session Chair: Marco Rito-Palomares, Tecnologico de Monterrey, Mexico

Location: Millennium Hall, 2nd floor

- 2:00 PM **Defining the Mechanistic Binding of Viral Particles to a Multi-modal Anion Exchange Resin.** Matthew Brown¹, Mike Burnham², Scott Lute¹, Fushan Wang², Sarah Johnson¹, Alison Walsh², Joseph Huges², Kurt Brorson¹, David Roush³, ¹Food and Drug Administration, Silver Spring, MD, USA; ²WuXi Apptec, Philadelphia, PA, USA; ³Merck, Kenilworth, NJ, USA
- 2:20 PM **Polymer Grafted Chromatography Media in the Purification of HIV-1 gag Virus-like Particles.** Patricia Pereira Aguilar¹, Tobias Amadeus Schneider², Alois Jungbauer¹, ¹University of Natural Resources and Life Sciences, Vienna, AUSTRIA; ²Austrian Centre of Industrial Biotechnology, Vienna, AUSTRIA
- 2:40 PM **Progress in Downstream Process of New Biopharmaceuticals using Non-traditional Chromatographic Strategies.** Cristina Peixoto¹, Ricardo Silva¹, Sofia Carvalho², Sara Rosa¹, Mafalda Moleirinho¹, Paula M. Alves², Manuel J.T. Carrondo³, ¹IBET, Oeiras, PORTUGAL; ²ITQB/IBET, Oeiras, PORTUGAL; ³IBET/DQ-FCT- UNL, Oeiras, PORTUGAL
- 3:00 PM **Modular Membrane Chromatography in a Cassette System for Large Scale Virus Capture Chromatography.** Stefan Fischer-Fruehholz, Martin Leuthold, Stefan Weisshaar, Miyako Hirai, Florian Taft, Sartorius Stedim Biotech GmbH, Goettingen, GERMANY
- 3:20 PM **Synthetic Protein Nanoparticles as Tools Informing the Chromatography of Virus Particle Products.** Stephan Joseph¹, Owen Thomas¹, Daniel Bracewell², ¹University of Birmingham, Birmingham, UK; ²University College London, London, UK
- 3:40-4:10 PM **Break**

Wednesday, July 19, 2017

12. Wednesday Session: Process Modeling and Design

Session Chair: Alois Jungbauer, BOKU Vienna

Location: Millennium Hall, 2nd floor

- 4:10 PM **A Simplified Approach to Design Chromatographic Processes for the Capture of Antibodies.** David Pfister¹, Laurent David¹, Margit Holzer¹, Jay Jun², Roger-Marc Nicoud¹, ¹Ypso-Facto, Nancy, FRANCE; ²Ypso-Facto, Cambridge, MA, USA
- 4:30 PM **A Design Calculation Method for Flow-through Chromatography Processes.** Sumiko Hasegawa, Noriko Yoshimoto, Shuichi Yamamoto, Yamaguchi University, Ube, JAPAN
- 4:50 PM **Determination of SMA Parameters for Ribulose-1,5-bisphosphate carboxylase/oxygenase from Nicotiana Tabacum in an Oligomeric State of More than 300 kDa.** Catherine Rose Muschen¹, Johannes Felix Buyel², ¹Fraunhofer IME, Aachen, GERMANY; ²RWTH Aachen University/Fraunhofer IME, Aachen, GERMANY
- 5:10 PM **When DoE Fails: Mechanistic Modeling for Chromatographic Manufacturability.** Thiemo Huuk¹, Tobias Hahn¹, Teresa Beck¹, Juergen Hubbuch², ¹GoSilico GmbH, Karlsruhe, GERMANY; ²Karlsruhe Institute of Technology (KIT), Karlsruhe, GERMANY
- 5:30 PM **Chromatography at High Viscosity.** Anton Schultze-Jena^{1,2}, Floor Boon¹, Paul Bussmann¹, Anja Janssen², Albert van der Padt^{2,3}, ¹TNO, Zeist, NETHERLANDS; ²Wageningen University, Wageningen, NETHERLANDS; ³FrieslandCampina, Amersfoort, NETHERLANDS
- 5:50-6:00 PM **CLOSING REMARKS,** Giorgio Carta, University of Virginia, Charlottesville, VA, USA
- 6:30-7:30 PM **FAREWELL RECEPTION**
PREP & ISPPP shared reception in ISPPP Exhibit/Poster Hall
Location: Commonwealth Hall B/C, 2nd floor

PREP 2017 Preliminary List of Poster Presentations

Poster Board size 42 inches high by 42 inches wide (107cm x 107cm)

See link to poster guidelines under Author Instructions at PREPsymposium.org

[Click here to submit abstracts online](#)

Customizing a Stationary Phase for Extreme usage Conditions. Hidehiro Itou¹, Imre Sallay², ¹Osaka Soda, Amagasaki, JAPAN; ²Osaka Soda, Osaka, JAPAN

Noninvasive Investigation on the State of the Column during CIP. Imre Sallay, Osaka Soda Co. Ltd., Osaka, JAPAN

Chromatography at High Viscosity. Anton Schultze-Jena^{1,2}, Floor Boon¹, Paul Bussmann¹, Anja Janssen², Albert van der Padt^{2,3}, ¹TNO, Zeist, NETHERLANDS; ²Wageningen University, Wageningen, NETHERLANDS; ³FrieslandCampina, Amersfoort, NETHERLANDS

Theoretical Study of Thermal and Radial Effects in Liquid Chromatography. Shamsul Qamar, Andreas Seidel-Morgenstern, Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, GERMANY

PREP 2017 Preliminary List of Poster Presentations

Poster Board size 42 inches high by 42 inches wide (107cm x 107cm)

See link to poster guidelines under Author Instructions at PREPsymposium.org

[Click here to submit abstracts online](#)

Simulation and Experimental Study of Continuous Chromatographic Purification of Prebiotics Galacto-Oligosaccharides. Ines Mueller¹, Lisa Schoon¹, Andreas Seidel-Morgenstern², Christof Hamel¹,
¹Anhalt University of Applied Sciences, Koethen (Anhalt), GERMANY; ²Otto von Guericke University, Magdeburg, GERMANY

Multi-layer Multi-component Adsorption: A Generic Isotherm Model for Liquid Chromatography. Ju Weon Lee, Andreas Seidel-Morgenstern, Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, GERMANY

Enhanced Peptide and Oligonucleotide Purification via Novel Orthogonal, Doped Reverse Phase Chromatography. Jurgen Machielse¹, Joachim Kinkel², Andrea Wild¹, Timothy O'Mara³, ¹Zeochem AG, Uetikon am See, SWITZERLAND; ²TU Nuernberg, Nuernberg, GERMANY; ³Itochu Chemicals America Inc., White Plains, NY, USA

Strongly Coupled Network Simulation with CADET. William Heymann, Samuel Leweke, Eric von Lieres, Forschungszentrum Juelich, Juelich, GERMANY

Investigations into the Effects of Mixed Mode Resin Ligand Chemistry on Recovery and Aggregate Removal of Homologous Tetravalent Bispecific Antibodies. Dana Motabar¹, Cassia Andrade¹, Ronald Schoner¹, Xuemei He², Yueping Xu², Jiali Liao², Christopher Belisle², Mark Snyder², Swarnim Ranjan³, Alan Hunter¹, Wai Keen Chung¹, ¹MedImmune, Gaithersburg, MD, USA; ²Bio-Rad, San Francisco, CA, USA; ³Rensselaer Polytechnic Institute, Troy, NY, USA

High-speed Gas and Headspace Analysis for the Process-line and Laboratory: SIFT-MS. Casey Anderson¹, Daniel Milligan², Barry Prince², Mark Perkins³, Terry Wilks⁴, ¹Quantum Analytics, Foster City, CA, USA; ²Syft Technologies, Christchurch, NEW ZEALAND; ³Anatune Limited, Cambridge, UK; ⁴Quantum Analytics, Foster City, CA, USA

Rapid Screening of Packaging for Residual Monomers using SIFT-MS. Casey Anderson¹, Daniel Milligan², Vaughan Langford², Barry Prince², Mark Perkins³, Terry Wilks¹, ¹Quantum Analytics, Foster City, CA, USA; ²Syft, Christchurch, NEW ZEALAND; ³Anatune Limited, Cambridge, UK

Efficient, Baseline Separation of Pyrethrins by Centrifugal Partition Chromatography. Vitold Glinski, Planta Analytica, New Milford, CT, USA

Evaluation of Non-affinity Continuous Capture Chromatography. Chris Thompson, Kelly Wilson, Michaela Wendeler, MedImmune, Gaithersburg, MD, USA

Pre-packed Columns for Protein Chromatography: Trend Analysis of Performance Parameters of Over a Time Span of Ten Years. Alois Jungbauer¹, Theresa Scharl-Hirsch², Christian Jungreuthmayer², Astrid Duerauer¹, Susanne Schweiger², Tim Schroeder³, ¹BOKU, Vienna, AUSTRIA; ²ACIB, Vienna, AUSTRIA; ³Repligen, Weingarten, GERMANY

Fundamental Studies of the Effect of pH and Temperature on the Adsorbent Surface Interaction for the Anion-exchange Chromatographic Separation. Gorgi Pavlov, James T. Hsu, Lehigh University, Bethlehem, PA, USA

The Effect of pH and Temperature on Protein Separation in Anion-exchange Chromatography. Gorgi Pavlov, James T. Hsu, Lehigh University, Bethlehem, PA, USA

Separation of PEGylated Ribonuclease A using PEGylated Monoliths. Calef Sanchez-Trasvina, Jose Gonzalez-Valdez, Marco Rito-Palomares, Tecnologico de Monterrey, Monterrey, MEXICO

PREP 2017 Preliminary List of Poster Presentations

Poster Board size 42 inches high by 42 inches wide (107cm x 107cm)
See link to poster guidelines under Author Instructions at PREPsymposium.org
[Click here to submit abstracts online](#)

Synthetic Chromatographic Resins for Purification of Proteins, Peptides and Small Molecules from a Complex Matrix. Benjamin Summers, Alessandra Basso, [Simona Serban](#), Purolite, Llantrisant, UK

Development of Mathematical Model to Identify the Fouling Mechanism in Depth Filters. [Dongyou Jang](#), Michael Peck, Nripen Singh, Michael Borys, Zheng Jian Li, Bristol-Myers Squibb, Devens, MA, USA

Development of a Scale-down TFF System to Mimic Commercial UF/DF Process: Evaluation of Equipment and Process Performance using Permeate Flux and Processing Time as Additional Criteria. [Lawrence Huang](#), Zach Rogers, Prasad Pathange, Bayer U.S., Berkeley, CA, USA

Preparative Protein Separation Base on Hydrophobic Interaction Chromatography using Polyethylene Terephthalate Capillary-channeled Polymer (C-CP) Phases. R. Kenneth Marcus, [Lei Wang](#), Terri Bruce, Tyler Stonecki, Clemson University, Clemson, SC, USA

A Root Cause Investigation Leveraging the Scaled-down UFDF Model for the Assessment of Higher Aggregate Levels in Drug Substance – A Case Study. [Elisa Pepicelli](#)¹, Dai Shen¹, John Amari¹, Sherry Castle¹, Piyush Jain¹, Matt Groff¹, Doug Ducharme¹, Joonsoo Lee¹, Saani Yakubu¹, Craig Howes¹, Christa Tauer², Yong Wang¹, ¹Shire, Lexington, MA, USA; ²Shire, Orth, AUSTRIA

Evaluation of Viral Clearance Studies for Monoclonal Antibody Chromatographic Process Steps. [William Evans](#), Atis Chakrabarti, Tosoh Bioscience LLC, King of Prussia, PA, USA

Extra Column Effects in Linear Gradient Elution. [Rainer Hahn](#), BOKU Vienna, Vienna, AUSTRIA

High Throughput LC/MS Purification of Pharmaceutical Impurities. [Florian Rieck](#), Ronald Guilliet, Stefan Ullrich, Agilent Technologies, Waldbronn, GERMANY

Automated LC/MS Purification of Compound Libraries. [Florian Rieck](#), Ronald Guilliet, Stefan Ullrich, Agilent Technologies, Waldbronn, GERMANY

New Process Analytical Technology for Monitoring Therapeutic Protein Products: Automated Micro-Volume Capillary Circular Dichroism and Fluorescence Spectroscopy for Rapid Analysis of Protein Conformation. [Charles Moore-Kelly](#)¹, John Welsh², Alison Rodger³, Tim Dafforn¹, Owen Thomas¹, ¹University of Birmingham, Birmingham, UK; ²Pall Corporation, Portsmouth, UK; ³University of Warwick, Warwick, UK

Evaluation of a Highly Effective Sporicidal Sanitization Solution for Protein A Affinity Resins. [Alexis Henry](#)¹, Elin Monie², Anna Groenberg², Matthew Wheeler³, Bill Carpenter¹, Greg Runyon¹, Edward Koepf¹, ¹Biogen, RTP, NC, USA; ²GE Life Sciences, Uppsala, SWEDEN; ³Kymanox, Durham, NC, USA

Enhancement of Your Pharmaceutical Development and/or Manufacturing Process through Integration of Deployable Mass Detection. [Ross Milam](#), Quantum Analytics, Foster City, CA, USA

Effect of Additive in Elution Buffers on Protein Separation with Ion-exchange Media. [Nandu Deorkar](#), B. Thiyagarajan, Hong Li, Quanxuan Zhang, Avantor Performance Materials, Phillipsburg, NJ, USA

Impact of Product and Recycle Times in MCSGP Polishing on Process Performance Parameters. [Sebastian Vogg](#), Nicole Ulmer, Massimo Morbidelli, ETH Zurich, Zurich, SWITZERLAND

PREP 2017 Preliminary List of Poster Presentations

Poster Board size 42 inches high by 42 inches wide (107cm x 107cm)
See link to poster guidelines under Author Instructions at PREPsymposium.org
[Click here to submit abstracts online](#)

Multi Column Chromatography: Number of Columns Required for Optimizing Protein A Capacity and Productivity. Xhorxhi Gjoka, Mark Pagkaliwangan, Jonathan Hummel, Aditya Utturkar, Mark Schofield, Pall Corporation, Westborough, MA, USA

Downstream Process Development for Tc24-C4, A Lead Chagas Disease Vaccine Candidate: Troubleshooting Purity Obstacles – Aggregation and Endotoxin. Elissa Hudspeth, C. Patrick McAtee, Jeroen Pollet, Oluwatoyin Asojo, Christopher A. Seid, Molly Hammond, Junfei Wei, Zhuyun Liu, Bin Zhan, Peter J. Hotez, Maria Elena Bottazzi, Baylor College of Medicine, Houston, TX, USA

Purification of Xylitol by HPLC Methods from Fermented Biomass. Yannick Krauke, Matthias Lubbert, Christian Benkhauser, KNAUER Wissenschaftliche Geräte GmbH, Berlin, GERMANY

Versatility of the Continuous Chromatography Platform. Rachel Quesenberry, Mark Schofield, Aditya Utturkar, Pall Corporation, Westborough, MA, USA

Description of Thermodynamic Equilibria between Adsorbed and Convective Phases under Nonideal Conditions. Franziska Ortner, Chantal Ruppli, Mazzotti Marco, ETH Zurich, Zurich, SWITZERLAND

Improving Downstream Processing of Influenza Virus-like Particles using Multi-column Chromatography. Sofia Carvalho¹, Ricardo Silva², Paula Alves¹, Cristina Peixoto¹, Manuel Carrondo³, ¹iBET/ITQB-UNL, Oeiras, PORTUGAL; ²iBET, Oeiras, PORTUGAL; ³iBET/ITQB-UNL/FCT-UNL, Oeiras, PORTUGAL

Exploration of Fiber-based Cation Exchange Adsorbents for the Removal of Monoclonal Antibody Aggregates. Johannes Winderl, Eric Neumann, Jürgen Hubbuch, Karlsruhe Institute of Technology (KIT), Karlsruhe, GERMANY

Use of Flocculants in Mammalian Cell Culture Processes for Enhanced Clarification Performance and Impurity Removal. Michael Peck¹, Ushma Mehta², Trish Greenberg², Nripen Singh¹, Michael Borys¹, Zheng Jian Li¹, ¹Bristol-Myers Squibb, Devens, MA, USA; ²MilliporeSigma, Bedford, MA, USA

Targeted Change of the Glycostructure of Therapeutic Monoclonal Antibodies by Combining Affinity Chromatography with Specific Glycoenzymes, Industrial Applicability. Roberto Falkenstein, Sebastian Malik, Matthias Freiherr von Roman, Ingrid Schmid, Thomas Dams, Marco Thomann Roche Diagnostics GmbH, Penzberg, GERMANY

Real Time Measurement of Product Quality Attributes using Light Scattering. Izhar Medalsy¹, Michael Larking¹, Douglas Richardson², Bhumit Patel², ¹Wyatt Technology, Santa Barbara, CA, USA; ²Merck and Co. Inc., Kenilworth, NJ, USA

Microwave-assisted Grafting Polymerization of Capillary-channeled Polymer (C-CP) Nylon Fibers for Immobilized Metal-ion Affinity Chromatography (IMAC) Protein Separations. Hung Trang, Ken Marcus, Clemson University, Clemson, SC, USA

Little Science – Big Difference in Peptide Purification Processes. Oscar Rebolledo¹, Imre Sallay², Keiji Koyanagi³, ¹DAISO Fine Chem USA Inc., Torrance, CA, USA; ²Osaka Soda Co. Ltd., Osaka, JAPAN; ³Osaka Soda Co. Ltd., Amagasaki, JAPAN

PREP 2017 Preliminary List of Poster Presentations

Poster Board size 42 inches high by 42 inches wide (107cm x 107cm)

See link to poster guidelines under Author Instructions at PREPsymposium.org

[Click here to submit abstracts online](#)

A New Binding Model for Complex Elution Behavior of mAb under High Loading Conditions on Cation Exchange Tentacle Resins. [Juliane Diedrich](#)¹, [William Heymann](#)¹, [Samuel Leweke](#)¹, [Stephen Hunt](#)², [Robert Todd](#)², [Christian Kunert](#)³, [Will Johnson](#)³, [Eric von Lieres](#)¹, ¹Forschungszentrum Julich, Julich, GERMANY; ²KBI Biopharma, Boulder, CO, USA; ³Amgen, Cambridge, MA, USA

Calibration of Mechanistic Chromatography Models using Artificial Intelligence. [Gang Wang](#)¹, [Till Briskot](#)¹, [Tobias Hahn](#)², [Pascal Baumann](#)¹, [Jurgen Hubbuch](#)¹, ¹Karlsruhe Institute of Technology, Karlsruhe, GERMANY; ²GoSilico GmbH, Karlsruhe, GERMANY

Preparative Reversed-Phase HPLC Purification and Salt Ion-Exchange Chromatography to Support GLP/GMP Deliveries. [Fuh-Rong Tsay](#), [Mirlinda Biba](#), [Ryan Cohen](#), [Lisa Frey](#), [Jerry Hill](#), [Junyong Jo](#), [Jinchu Liu](#), [Zhijian Liu](#), [Ingrid Mergelsberg](#), [Jimmy DaSilva](#), Merck & Co. Inc., Rahway, NJ, USA

Protein Capture on 3D-printed Solid Tolerant Chromatography Columns for a Range of Chromatographic Functions. [Anne Gordon](#)¹, [Conan Fee](#)¹, [Simone Dimartino](#)², ¹University of Canterbury, Christchurch, NEW ZEALAND; ²University of Edingburgh, Edinburgh, UK

Column Qualification Runs: Influence of 3D Packing Structure, Peak Analysis Method, and Measurement Accuracy. [Susanne Schweiger](#)¹, [Stephan Hinterberger](#)¹, [Tim Schroeder](#)², [Christine Gebski](#)², [James Peyser](#)², [Astrid Duerauer](#)³, [Alois Jungbauer](#)³, ¹Austrian Centre of Industrial Biotechnology, Vienna, AUSTRIA; ²Repligen, Waltham, MA, USA; ³BOKU, Vienna, AUSTRIA

When DoE Fails: Mechanistic Modeling for Chromatographic Manufacturability. [Thiemo Huuk](#)¹, [Tobias Hahn](#)¹, [Teresa Beck](#)¹, [Juergen Hubbuch](#)², ¹GoSilico GmbH, Karlsruhe, GERMANY; ²Karlsruhe Institute of Technology (KIT), Karlsruhe, GERMANY

Peptide Purification Utilizing an Automated Focused Gradient for Scale Up with Automated Delay Volume Calibration Versus a Manual Linear Scale Up and Calculated Delay Volume Calibration for Reliable Fractionation of LC Runs into an Open Bed Fraction Collector. [Lori Sandford](#), [Lance Kasper](#), Agilent Technologies, Inc., Wood Dale, IL, USA