—PREP 2019 Scientific Program—

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(program as of 6/28/2019)

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All devices must be silenced and screens darkened in oral sessions. No photography or recording is allowed in oral sessions or in the poster/exhibit hall. You must wear your official conference name badge (no badge sharing), and your name and name badge must be completely visible at all times, in order to enter, and while you are inside, the meeting rooms and poster/exhibition hall. Persons without a visible name badge, or with a badge that is not their own name badge, will be escorted out of the meeting room or exhibition hall. Material presented or displayed during the conference, including but not limited to orals, posters, workshops, and exhibit booths, is the intellectual property of the presenter and may not be recorded, photographed, quoted, disseminated or transmitted by summary in any form without express written authority of the author. Opinions expressed by presenters, instructors and exhibitors are not necessarily the opinions of the PREP 2019 Symposium.
The Workshop and Tutorial Training Program provides advanced tutorials covering various aspects of preparative and process chromatography. Workshops and Tutorial are open to conference and non-conference participants. See details and pricing posted online under "Workshops & Tutorial" at PREPsymposium.org. Must pre-register to attend.

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<th>Sunday, July 7</th>
<th>Workshops (See registration form for cost)</th>
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| 9:00 AM - 1:00 PM | Fundamentals of Preparative Chromatography for Biomolecule Purification by Batch and Continuous Processes  
Maryland Suite  
“ANNAPOLIS”  
2nd floor | Giorgio Carta, University of Virginia  
Alois Jungbauer, BOKU, Vienna  
Massimo Morbidelli, ETH Zurich |
| 2:00 PM - 6:00 PM | Fundamentals of Preparative Chromatography for Purification of Small and Intermediate Size APIs by Batch Chromatography, SMB, and SFC  
Maryland Suite  
“ANNAPOLIS”  
2nd floor | Olivier Dapremont, AMPAC Fine Chemicals  
Geoffrey Cox, Chromatography Consultant |
| Monday, July 8 | Tutorial (See registration form for cost) | Instructor |
| 7:00 AM - 8:25 AM | Tips, Tricks, and Troubleshooting Analytical and Overloaded Prep Chromatography  
Maryland Suite  
“ANNAPOLIS”  
2nd floor | Cecilia Mazza, Nouryon/Kromasil  
Tony Yan, Pfizer, Inc. |
| Tuesday, July 9 | Tutorial (See registration form for cost) | Instructor |
| 7:00 AM - 8:25 AM | Practical Concepts on Process Characterization and Validation of Biopharmaceuticals based on QbD Principles  
Maryland Suite  
“ANNAPOLIS”  
2nd floor | Gisela Ferreira, AstraZeneca |
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.
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 8, at 7:00 - 8:25 AM
Tips, Tricks, and Troubleshooting Analytical and Overloaded Prep Chromatography

**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 Lecturers:**

**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, now Nouryon.

**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 8, at 7:00 - 8:25 AM
Practical Concepts on Process Characterization and Validation of Biopharmaceuticals based on QbD Principles

**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 Lecturer:**

**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 AstraZeneca. Prior to joining AstraZeneca 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.
**Monday Free Vendor Technical Workshops**
**July 8, 2019 at 12:30 – 2:00 PM**
Must pre-register at the sponsor’s booth to attend; light meal will be provided

12:30-2:00 pm  
Maryland Suite “ANNAPOlis”  
2nd floor  
Drivers and Visions for Process Development and Purification Technology for Antibody Variants, Viral Vectors and Oligos  
Sponsored by GE Healthcare Life Sciences  
*Must pre-register at the booth of GE Healthcare Life Sciences by Monday @ 10:50 AM*

Presenter: Peter Hagwall and John Scibetta. The changing biopharma pipeline is creating challenges to process development and manufacturing methodology. Bispecific antibodies, conjugated antibodies and other antibody variants as well as viral vectors and oligonucleotides contribute to this increased molecular diversity. With an ever-increasing pressure to reduce time to market, there is a need to revise how process development is performed and what technologies are employed for manufacturing. We will review the trends in process development and emerging technology for purification of these molecular formats and discuss purification strategies to address the increasing productivity demands of mAbs and purification approaches for antibody variants including bispecific antibodies.

12:30-2:00 pm  
Maryland Suite “COLUMBIA”  
2nd floor  
Overcoming mAb and Virus Purification Challenges with Innovative Resin Designs  
Sponsored by Bio-Rad Laboratories  
*Must pre-register at the booth of Bio-Rad Laboratories by Monday @ 10:50 AM*

Presenters: Dr. Mark A. Snyder, R&D Manager and Dr. Carsten Voss, Applications Manager of the Process Chromatography Group at Bio-Rad Laboratories. Purification of biologics can face a range of obstacles, depending on the characteristics of the molecule, which can affect product purity and recovery. Improvements of purification tools are necessary to overcome these challenges and must be engineered for easy scalability to meet manufacturing demands. In this seminar, we will discuss the difficulties that are faced when developing purification strategies for monoclonal antibodies and viruses. We will explore innovative resin designs and functionalities and examine recent case studies and current processes that benefit from these resins used from capture to polishing of biologics.

12:30-2:00 pm  
Maryland Suite “BALTIMORE”  
2nd floor  
Flexible Solutions for Continuous and Batch Purification of Small Molecules and Biomolecules  
Sponsored by KNAUER  
*Must pre-register at the booth of KNAUER by Monday @ 10:50 AM*

Presenter: Paul Pietsch. KNAUER presents a new generation solution enhancing the flexibility of purification. With a new device up to three different modules such as pumps, valves and detectors can be easily used. The fast exchange of modules by the user allows an easy adaption to different purification tasks and reduces the down times and service costs. Above that KNAUER’s robust purification solutions offer a wide detector portfolio, e.g. mass-triggered fractionation. Smart valves allow switching tasks beyond peak and solvent recycling. And even more: Increase the purity and yield of your purification by a continuous process with AZURA SMB. KNAUER offers purification solutions for small and biomolecules. Get to know the new device/systems at our booth.

12:30-2:00 pm  
Maryland Suite “FREDERICK”  
2nd floor  
Cost Reduction Verification Test with 50L Scale Down Stream Process  
Sponsored by DAISO Fine Chem USA, Inc.  
*Must pre-register at the booth of DAISO Fine Chem USA, Inc. by Monday @ 10:50 AM*

Presenter: Masashi Jousha. Daisogel series new protein A media has the ability to elute antibodies at mild pH which contributes to the quality of the antibody. The exposure of the antibody to acidic conditions is reduced and as a result, the aggregate formation is suppressed. This helps improve the antibody yield and purity leading to an overall cost savings. In addition, filter consumption in the manufacturing process is also reduced, making it less likely to lose product by filter replacement. In this workshop, we show an example of purifying 50 L of culture supernatant and estimate the cost saving effect.
Tuesday Morning Free Vendor Technical Workshop
July 9, 2019 at 7:00 – 8:25 AM
Must pre-register at the sponsor’s booth to attend; light meal will be provided

7:00-8:25 am Accelerating Antibody Drug Development – Innovative Solutions for Antibody Purification
Maryland Suite “FREDERICK” 2nd floor
Sponsored by Thermo Fisher Scientific

Must pre-register at the booth of Thermo Fisher Scientific by Monday @ 10:50 AM

The changing landscape for antibody-derived therapeutics, such as bi-specific monoclonal antibodies, Fabs and Fc-fusion proteins, brings new purification challenges in the downstream process of these molecules. Standard chromatography resins, such as protein A, may not result in the most efficient process. During this seminar you will learn more about efficient purification of antibody therapeutics and how our unique portfolio of antibody affinity resins can help you develop the next generation of antibody therapeutics, including a customer case study showing an improved therapeutic antibody manufacturing process.

Tuesday Free Vendor Technical Workshops
July 9, 2019 at 12:30 – 2:00 PM
Must pre-register at the sponsor’s booth to attend; light meal will be provided

12:30-2:00 pm Manufacturing Innovation: A Complete Chromatography Resin Portfolio for Reverse-phase, Ion Exchange and Protein A Affinity Separations
Maryland Suite “COLUMBIA” 2nd floor
Sponsored by Purolite Life Sciences

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

Presenters: Hans J. Johansson and Alessandra Basso. Hans J. Johansson will give an update on recent developments of the Praesto range of agarose-based chromatography resins. The presentation will cover Protein A, high salt tolerant IEX resins, and the jetting technology for continuous manufacturing of resins with a very narrow particle distribution. Alessandra Basso will present the Chromalite M methacrylate-based resins with a full range of functionalities, including ion exchange, reverse-phase and, affinity chromatography. Available in standard average particle sizes of 50 -100 µm and 75-200 µm, for high resolution, intermediate purification, or capture chromatography; Purolite Life Sciences can also offer customization of Chromalite M from 5 to 500 µm for any application.

12:30-2:00 pm New Developments in the Purification of Biotherapeutics
Maryland Suite “FREDERICK” 2nd floor
Sponsored by Nouryon/Kromasil

Must pre-register at the booth of Nouryon/Kromasil by Tuesday @ 10:40 AM

Presenter: Cecilia Mazza. Peptides and oligonucleotides have an increased interest due their therapeutics potential and chromatographers must deal with an ever-increasing variety of structures in the purification of key APIs. Kromasil, high performance chromatographic media based on state-of-the-art spherical silica for UHPLC/HPLC/SFC analysis and purification using HPLC, SFC and SMB process technology, has a unique combination of pore volume and surface area, plus very high mechanical and chemical stability, making it ideal for the separation of substances from small to large biotherapeutics. During this workshop, we will share the latest solutions for the purification of complex biotherapeutic mixtures, including method development and optimization for maximizing purity, yield and productivity.
12:30-2:00 pm  A Unified Open-Access Amenable Workflow from Analysis to Purification  
Maryland Suite “ANAPOLIS” 2nd floor  
Sponsored by Agilent Technologies  
Must pre-register at the booth of Agilent Technologies by Tuesday @ 10:40 AM  
Presenter: Paul Zimba, Center for Coastal Studies, Texas A&M University-Corpus Christi. Currently cyanobacteria, diatoms, haptophytes, dinoflagellates, euglenoids, and raphidophytes are known to produce algal toxins. Bioactivity of these toxins include neurotoxicity, cytotoxicity, hepatotoxicity, and a significant number with unknown targets. Preparation of these toxin standards largely relies on purification from algal cells. In this workshop we present the workflow of euglenophycin, from analysis to purification, to determine the presence of compounds, as well as purify these compounds in an open access and automated manner. This workflow allows researchers to determine the presence of targeted compounds through an analytical run, then the system automatically scales the solvent gradient to purify the selected compounds using the preparative purification system, which can be triggered on time, UV absorption and/or MS signal of target peak.

12:30-2:00 pm  Industrial Purification Solutions with Innovative Process Technology  
Maryland Suite “BALTIMORE” 2nd floor  
Sponsored by Novasep  
Must pre-register at the booth of Novasep by Tuesday @ 10:40 AM  
Presenter: Jin Seok Hur. In the workshop, we will present innovative chromatography processes such as Cyclojet® and GSSR® (Gradient Steady State Recycle), which are designed to resolve challenging purifications with outstanding productivity. The cutting-edge technologies have been proven at development scale and are already used for large scale API manufacturing at Novasep. Novasep provides flexible development and manufacturing solutions for APIs to innovators at a wide range of production scales. We offer specialized technologies, process development expertise and an outstanding regulatory track record. Novasep is a leading manufacture and operator of industrial chromatography equipment, with over 30 years of commercial manufacturing experience.
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 presented to the best poster contributions in the two separate categories of (a) academic and non-profit research institutions and (b) industry. In the case of joint academia/industry posters, the affiliation of the poster presenter will determine the category. Posters will be evaluated on the basis of scientific content, clarity of presentation, and layout. 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 9.

Presentation of awards to winners of the Best Poster Competition will take place at the end of the session immediately prior to the Wednesday mid-morning break. The winners are encouraged to be present, but it is not mandatory to be present to win.

PREP Symposium Conference History

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- BIO-RAD
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- YMC America Inc.
# Sunday, July 7, 2019

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<td>9:00 AM - 1:00 PM</td>
<td>Workshop 1 on Fundamentals of Preparative Chromatography for Biomolecule Purification by Batch and Continuous Processes</td>
<td>Maryland Suite “ANAPOLIS” 2nd floor</td>
<td>See details and pricing at <a href="http://PREPsymposium.org">PREPsymposium.org</a>. Open to conference and non-conference participants. Must pre-register to attend.</td>
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<tr>
<td>2:00 PM - 6:00 PM</td>
<td>Workshop 2 on Fundamentals of Preparative Chromatography for Purification of Small and Intermediate Size APIs by Batch Chromatography, SMB, and SFC</td>
<td>Maryland Suite “ANAPOLIS” 2nd floor</td>
<td>See details and pricing at <a href="http://PREPsymposium.org">PREPsymposium.org</a>. Open to conference and non-conference participants. Must pre-register to attend.</td>
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<td>1:30 PM - 5:30 PM</td>
<td>Exhibitor Registration Only -- badge required to set up booth</td>
<td>Location: Constellation Ballroom, 2nd floor</td>
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<tr>
<td>6:00 PM - 7:30 PM</td>
<td>Symposium Registration Open for Conferees</td>
<td>Location: Constellation Ballroom, 2nd floor</td>
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<td>6:00 PM - 7:30 PM</td>
<td>Grand Opening of the Exhibition &amp; Welcome Reception</td>
<td>Location: Constellation Ballroom, 2nd floor</td>
<td>Open to all conference participants; conference name badge is required for entry.</td>
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# Monday, July 8, 2019

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<td>Tutorial on Tips, Tricks, and Troubleshooting Analytical and Overloaded Prep Chromatography</td>
<td>Maryland Suite “ANAPOLIS” 2nd floor</td>
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<tr>
<td>7:30 AM</td>
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<td>10:00 AM - 7:10 PM</td>
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Monday, July 8, 2019

**Monday Welcome and Opening Remarks**
Location: Constellation Ballroom C/D, 2nd floor

8:30 AM - 8:40 AM  **WELCOME AND OPENING REMARKS**
Giorgio Carta, University of Virginia, Charlottesville, VA, USA

1. **Monday Keynote Session: Industrial Case Studies in Protein Chromatography**
Session Chairs: Alan Hunter and Timothy Pabst, AstraZeneca
Location: Constellation Ballroom C/D, 2nd floor

8:40 AM  (L-101)  **Applying Quality by Design Principles for Accelerated Process Characterization and Biologics Development.** Hong Li¹, Gaurav Chauhan¹, Sunitha Kandula¹, David Wylie¹, Seth Clark², Gregg Nyberg¹, ¹Merck & Co. Inc., Kenilworth, NJ, USA; ²Merck & Co. Inc., West Point, PA, USA

9:00 AM  (L-102)  **Development of ADC Purification Tool Box to Address Manufacturing Challenges.** Lihua Yang, AbbVie, Worcester, MA, USA

9:20 AM  (L-103)  **A Case Study of Mechanistic Chromatography Model Applications in a Lean Development Paradigm.** Connor Thompson, Rachel Hendricks, Mark Fedesco, Jessica Yang, Genentech Inc., South San Francisco, CA, USA

9:40 AM  (L-104)  **Decoupling Secondary Adsorption Mechanisms in Apparent Protein Uptake on Protein A Resins for Rational Capture Design.** Ronald Maurer, Jie Chen, Sanchayita Ghose, Zhengjian Li, Bristol-Myers Squibb, Devens, MA, USA

10:00 AM  (L-105)  **Process Optimization and Protein Engineering Mitigated Manufacturing Challenges of a Monoclonal Antibody with Liquid-liquid Phase Separation Issue.** Haibin Luo, Qun Du, Melissa Damschroder, Timothy Pabst, Alan Hunter, William Wang, MedImmune, Gaithersburg, MD, USA

10:20 AM - 10:50 AM  **Mixer in Constellation Exhibition Hall, 2nd floor**

2. **Monday Session: Innovative Stationary Phases and Processes**
Session Chair: Lois Ann Beaver, LAB Enterprises
Location: Constellation Ballroom C/D, 2nd floor

10:50 AM  (L-106)  **Application of Stimuli-Responsive Polymers for the Downstream Recovery of Proteins.** Sinuo Tan, Roshanak Sepehrifar, Pankaj Maharjan, Yuanzhong Yang, Roy Jackson, Lachlan Schwarz, Eva Campi, Reinhard Boysen, Kei Saito, Milton Hearn, Monash University, Clayton, AUSTRALIA

11:10 AM  (L-107)  **Peptide-based Adsorbents for Improved Clearance of CHO Host Cell Proteins in Flow-through Mode.** Ashton Lavoie¹, Alice DiFazio¹, Kevin Blackburn², David Muddiman¹, Michael Goshe¹, Ruben Carbonell¹, Stefano Menegatti¹, ¹North Carolina State University, Raleigh, NC, USA; ²Waters Corporation, Raleigh, NC, USA

11:30 AM  (L-108)  **A Mathematical Framework for Quantifying Product-Agnostic Orthogonality in Preparative Chromatography: Selecting and Designing Optimally Orthogonal Resins.** Nicholas Vecchiarello, Camille Bilodeau, Scott Altern, Steven Cramer, Rensselaer Polytechnic Institute, Troy, NY, USA
Did You Know that Magnetic Separation for Proteins Does Not have to be Expensive?
Sonja Berensmeier, Silvia Blank-Shim, Sebastian Schwaminger, Alexander Zanker, Fraga-García Paula, Technical University of Munich, Garching, GERMANY

3D Printed Monoliths with Quaternary Amine Functionality for Protein Separations.
Ursula Simon, Simone Dimartino, University of Edinburgh, Edinburgh, UK

Monday Mixer in the Constellation Exhibition Hall
Location: Constellation Ballroom, 2nd floor – Mixer includes light lunch in the hall

Break, Exhibits, Mixer, Posters

Monday Free Vendor Technical Workshops
Must pre-register at the sponsor's booth to attend; light lunch will be provided

Drivers and Visions for Process Development and Purification Technology for Antibody Variants, Viral Vectors and Oligos
Sponsored by GE Healthcare Life Sciences
Must pre-register at the booth of GE Healthcare Life Sciences by Monday @ 10:50 AM

Overcoming mAb and Virus Purification Challenges with Innovative Resin Designs
Sponsored by Bio-Rad Laboratories
Must pre-register at the booth of Bio-Rad Laboratories by Monday @ 10:50 AM

Flexible Solutions for Continuous and Batch Purification of Small Molecules and Biomolecules
Sponsored by KNAUER
Must pre-register at the booth of KNAUER by Monday @ 10:50 AM

Cost Reduction Verification Test with 50L Scale Down Stream Process
Sponsored by DAISO Fine Chem USA, Inc.
Must pre-register at the booth of DAISO Fine Chem USA, Inc. by Monday @ 10:50 AM

MONDAY POSTER SESSION 1
Poster Session Chairs: Melody Schmidt, Genentech and Owen Thomas, University of Birmingham
Location: Constellation Ballroom C/D, 2nd floor

POSTER SESSION 1 - Sponsored by Bristol-Myers Squibb
### 3A. Monday Parallel Session: Process Modeling - I

**Session Chair:** Abraham Lenhoff, University of Delaware  
**Location:** Constellation Ballroom C, 2nd floor

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<th>Time</th>
<th>Presentation</th>
<th>Authors</th>
<th>Institutions</th>
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<tr>
<td>3:20 PM</td>
<td>(L-111) <strong>Modeling of Ion Exchange Chromatography: From Mechanistic to Empirical and Back.</strong> Till Briskot¹, Tobias Hahn¹, Thiemo Huuk¹, Jürgen Hubbuch², ¹GoSilico GmbH, Karlsruhe, GERMANY; ²Karlsruhe Institute of Technology (KIT), Karlsruhe, GERMANY</td>
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<td>3:40 PM</td>
<td>(L-112) <strong>Modeling of Monoclonal Antibody Charge Variant Elution in Mixed-mode Cation Exchange Chromatography.</strong> Jan Hedrich¹, Felix Seelinger¹, Romas Skudas², Michael M. Schulte², Christian Frech¹, ¹University of Applied Sciences, Mannheim, GERMANY; ²Merck KGaA, Darmstadt, GERMANY</td>
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<td>4:00 PM</td>
<td>(L-113) <strong>Accelerated Process Design and Simulation of Linear Gradient Elution of Proteins by using Mechanistic Modeling.</strong> Chyii-Shin Chen, Noriko Yoshimoto, Shuichi Yamamoto, Yamaguchi University, Ube, JAPAN</td>
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<td>4:20 PM</td>
<td>(L-114) <strong>Mechanistic Modeling of Chromatography for On-demand Production of Biologics.</strong> Sevda Deldari¹, Shayan Borhani¹, Payam Rezaei², Yang Liu², Abhay Andar¹, Govind Rao¹, Douglas Frey², ¹University of Maryland Baltimore County CAST, Baltimore, MD, USA; ²University of Maryland Baltimore County, Baltimore, MD, USA</td>
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<td>4:40 PM - 5:10 PM</td>
<td><strong>Mixer in Constellation Exhibition Hall, 2nd floor</strong></td>
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### 3B. Monday Parallel Session: Stationary Phases - I

**Session Chair:** Rainer Hahn, BOKU, Vienna  
**Location:** Constellation Ballroom D, 2nd floor

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<th>Time</th>
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<tr>
<td>3:20 PM</td>
<td>(L-115) <strong>Exploring Enhanced Selectivity on Ion Exchange Resin in ADC Polishing.</strong> Annika Holzgreve, Michael Schulte, Romas Skudas, Merck KGaA, Darmstadt, GERMANY</td>
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<td>3:40 PM</td>
<td>(L-116) <strong>Mixed PEL Brush Modified Porous Chromatography Media for pH Modulated Protein Separations.</strong> Thantawat Theeranan, Owen R.T. Thomas, University of Birmingham, Birmingham, UK</td>
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<td>4:00 PM</td>
<td>(L-117) <strong>Chromalite M: A Novel Range of Methacrylic Polymers with High Performance in Chromatographic Bio-Separations.</strong> Benjamin Summers, Alessandra Basso, Simona Serban, Purolite Ltd., Llantrisant, UK</td>
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<td>4:20 PM</td>
<td>(L-118) <strong>Strategies for Process Design: Unlocking Combinations with Continuous Chromatography and Cutting-edge Technologies.</strong> Ben Kester, Joseph Pate, Kate Blando, Catalent, Bloomington, IN, USA</td>
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<td>4:40 PM - 5:10 PM</td>
<td><strong>Mixer in Constellation Exhibition Hall, 2nd floor</strong></td>
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Monday, July 8, 2019

4A. Monday Parallel Session: Process Modeling - II
Session Chair: Dorota Antos, Rzeszow University of Technology
Location: Constellation Ballroom C, 2nd floor

5:10 PM (L-119) Prediction of Protein Mixture Elution on Anion Exchangers.
Catherine Mueschen, Ronald Jaepel, Johannes Buyel, Fraunhofer IME, Aachen, GERMANY

5:30 PM (L-120) Error Modeling in Chromatography and Parameter Confidence.
William Heymann, Eric von Lieres, Forschungszentrum Jülich, Julich, GERMANY

5:50 PM (L-121) Down the Drain: Troubleshooting At-scale Affinity Chromatography.
William Rayfield1, Ehsan Borujeni1, Sandra Rios1, Edward Glowacki1, Jiong Yang2, Mark Haverick1, Tim St. Clair1, Jesse Minor1, 1Merck, Kenilworth, NJ, USA; 2Merck, Rahway, NJ, USA

6:10 PM - 7:10 PM Reception in Constellation Exhibition Hall, 2nd floor

4B. Monday Parallel Session: Stationary Phases - II
Session Chair: Alois Jungbauer, BOKU, Vienna
Location: Constellation Ballroom D, 2nd floor

5:10 PM (L-122) Protein A Chromatography: Important Features in Process Optimization and Benefits of Additives for mAb Elution.
Jukka Kervinen, William Evans, J. Kevin O'Donnell, Atis Chakrabarti, Phu Duong, Ali Soleymannezhad, Tosoh Bioscience LLC, King of Prussia, PA, USA

5:30 PM (L-123) Protein A Engineering to Enhance Performance, Alkali Stability and Bioburden Control.
Magnus Wetterhall, Mats Ander, Tomas Bjorkman, Gustav Rodrigo, GE Healthcare Lifesciences, Uppsala, SWEDEN

5:50 PM (L-124) Sweet, Sweeter - Stevia – From Analytical Method Development to a Robust and Effective Preparative HPLC Online SPE Purification Method for Steviolglycosides.
Yannick Krauke, Juliane Böttcher, Johannes Menke, Kate Monks, KNAUER Wissenschaftliche Geräte GmbH, Berlin, GERMANY

6:10 PM - 7:10 PM Reception in Constellation Exhibition Hall, 2nd floor
### Tuesday Tutorial

7:00 AM - 8:25 AM  
Maryland Suite  
“ANAPOLIS”  
2nd floor  
**Practical Concepts on Process Characterization and Validation of Biopharmaceuticals based on QbD Principles**  
See details and pricing at PREPsymposium.org. Open to conference and non-conference participants. Must pre-register to attend.

### Tuesday Free Vendor Technical Workshop

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

7:00-8:25 am  
Maryland Suite  
“FREDERICK”  
2nd floor  
**Accelerating Antibody Drug Development – Innovative Solutions for Antibody Purification**  
Sponsored by Thermo Fisher Scientific  
*Must pre-register at the booth of Thermo Fisher Scientific by Monday @ 10:50 AM*

7:30 AM  
**Symposium Registration Open**

9:00 AM - 3:30 PM  
**Exhibition Open**

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

Session Chair: Qi (Tony) Yan, Pfizer  
Location: Constellation Ballroom C/D, 2nd floor

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<th>Time</th>
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| 8:30 AM   | (L-201) *Diluent-to-Eluent Strength Mismatch in Preparative Liquid Chromatography: Coping with Resolution Losses From in-Silico Approaches.*  
            Fabrice Gritti, Jason Hill, Martin Gilar, Waters Corporation, Milford, MA, USA |
| 8:50 AM   | (L-202) *Using pH as a Tool for Prep Chromatography: What if it Degrades Your Compound?*  
            J Preston, Phenomenex, Torrance, CA, USA |
| 9:10 AM   | (L-203) *Exploring the Relationship of SFC Stationary Phase Chemistry to Optimize Separation Performance.*  
            Matthew Przybyciel, ES Industries, West Berlin, NJ, USA |
| 9:30 AM   | (L-204) *Preparative Separation of Phosphorothioated Antisense Oligonucleotides.*  
            Martin Enmark\(^1\), Joakim Bagge\(^1\), Jorgen Samuelsson\(^1\), Linda Thunberg\(^2\), Hanna Leek\(^2\), Fredrik Lime\(^3\), Per Jageland\(^3\), Torgny Fornstedt\(^4\),  
            "Karlstad University, Karlstad, SWEDEN;  
            "AstraZeneca, Gothenburg, SWEDEN;  
            "Nouryon, Bohus, SWEDEN |
| 9:50 AM   | (L-205) *Recycling Liquid Chromatographic Technology to Support Drug Discovery and Development.*  
            Frank Riley, Tony Q. Yan, Pfizer, Groton, CT, USA |

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<td>10:10 AM</td>
<td><strong>Mixer in Constellation Exhibition Hall</strong>, 2nd floor</td>
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</table>
Tuesday, July 9, 2019

6. Tuesday Keynote Session: Continuous Chromatography
Session Chair: Sunitha Kandula, Merck & Co., Inc.
Location: Constellation Ballroom C/D, 2nd floor

10:40 AM  (L-206) Automated End-to-end Integrated Manufacturing of an Antibody.
Sebastian Vogg, Moritz Wolf, Fabian Feidl, Nicole Ulmer, Ruben Wälchli, Massimo Morbidelli, ETH Zürich, Zürich, SWITZERLAND

11:00 AM  (L-207) Virus Clearance with Continuous Multi-column Chromatography.
Jason Forte¹, Mark Pagkaliwangan¹, Meng-Jung Chiang², Scott Lute², Denis Kole¹, Krunal Mehta¹, Glen Bolton³, Mark Schofield¹, Kurt Bronson², ¹Pall, Westborough, MA, USA; ²U.S. Food and Drug Administration, Silver Spring, MD, USA; ³Amgen, Cambridge, MA, USA

11:20 AM  (L-208) High Productivity and High Purity Charge Variant Isolation using Continuous Chromatography. Yuanli Song, Bristol-Myers Squibb, Devens, MA, USA

11:40 AM  (L-209) Peptide Purification using Two- and Three-column Simulated Countercurrent Chromatography. Tiago Santos, Raquel Serra, Goncalo Policarpo, Joao Antunes, Jose Mota, LAQV/REQUIMTE FCT-UNL, Caparica, PORTUGAL

12:00 PM  (L-210) Adaptive Cycle to Cycle Control of Simulated Moving Bed Processes.
Achim Kienle, Otto von Guericke University, Magdeburg, GERMANY

Tuesday Mixer in the Constellation Exhibition Hall
Location: Constellation Ballroom, 2nd floor – mixer includes light lunch

12:20 PM - 3:10 PM  Break, Exhibits, Mixer, Posters

Tuesday Free Vendor Technical Workshops
Must pre-register at the sponsor's booth to attend; light lunch will be provided

12:30-2:00 pm  Maryland Suite “COLUMBIA” 2nd floor
Manufacturing Innovation: A Complete Chromatography Resin Portfolio for Reverse-Phase, Ion Exchange and Protein A Affinity Separations
Sponsored by Purolite Life Sciences
Must pre-register at the booth of Purolite Life Sciences by Tuesday @ 10:40 AM

12:30-2:00 pm  Maryland Suite “FREDERICK” 2nd floor
New Developments in the Purification of Biotherapeutics
Sponsored by Nouryon/Kromasil
Must pre-register at the booth of Nouryon/Kromasil by Tuesday @ 10:40 AM

12:30-2:00 pm  Maryland Suite “ANAPOLIS” 2nd floor
A Unified Open-Access Amenable Workflow from Analysis to Purification
Sponsored by Agilent Technologies
Must pre-register at the booth of Agilent Technologies by Tuesday @ 10:40 AM

12:30-2:00 pm  Maryland Suite “BALTIMORE” 2nd floor
Industrial Purification Solutions with Innovative Process Technology
Sponsored by Novasep
Must pre-register at the booth of Novasep by Tuesday @ 10:40 AM
Tuesday, July 9, 2019

TUESDAY POSTER SESSION 2
Poster Session Chairs: Melody Schmidt, Genentech and Owen Thomas, University of Birmingham
Location: Constellation Ballroom C/D, 2nd floor

1:50 PM - 3:10 PM  POSTER SESSION 2 - Sponsored by Bristol-Myers Squibb

7A. Tuesday Parallel Session: QbD in Biopharmaceutical Process Development and Manufacturing
Session Chair: Christian Frech, University of Applied Sciences, Mannheim
Location: Constellation Ballroom C, 2nd floor

3:10 PM  (L-211) QbD: Light on a Chromatography Blind Spot. Gunnar Malmquist, Peter Hagwall, John Scibetta, GE Healthcare, Uppsala, SWEDEN

3:30 PM  (L-212) Real-time Monitoring and Model-based Prediction of Purity and Quantity in a Chromatographic Step of a Biopharmaceutical. Dominik Georg Sauer1, Michael Melcher2, Theresa Scharl-Hirsch3, Friedrich Leisch2, Alois Jungbauer2, Astrid Dürauer2, 1ACIB, Vienna, AUSTRIA; 2BOKU, Vienna, AUSTRIA

3:50 PM  (L-213) Application of Multi-attribute Monitoring and In-silico Methodology to Address Challenges during Process Development of mAb Intermediate for ADC Programme. Tingting Cui1, Matthew Edgeworth1, Samuel Shepherd1, Lu Shan2, Alistair Hines1, Nicholas Bond1, Richard Turner1, 1AstraZeneca, Cambridge, UK; 2AstraZeneca, Gaithersburg, MD, USA

4:10 PM  (L-214) Utilizing Mechanistic Modeling for Critical Process Parameter Identification. Rachel Hendricks, Jessica Yang, Connor Thompson, Mark Fedesco, Genentech, South San Francisco, CA, USA

4:30 PM  (L-215) Evaluating High throughput Chromatography for Process Characterization of Different Fc-based Modalities. Catherine Grimm, Ashish Sharma, Balakumar Thangaraj, Amgen Inc., Cambridge, MA, USA

4:50 PM - 5:00 PM  Intermission
Tuesday, July 9, 2019

7B. Tuesday Parallel Session: Stationary Phases - III
Session Chair: Marco Rito-Palomares, Tecnologico de Monterrey
Location: Constellation Ballroom D, 2nd floor

3:10 PM  (L-216) Downstream Process Development for a Clinical Stage Retrovirus like Particle. Mark Snyder¹, Mark Fitchmun², ¹Bio-Rad Laboratories, Hercules, CA, USA; ²Somatek, San Diego, CA, USA

3:30 PM  (L-217) A New Chromatographic Approach to Quickly Assess ADCC Activity of Therapeutic Antibodies. Leila Salim Abadi Ghaleh¹, Toru Tanaka², Egbert Muller³, ¹TU Darmstadt, Darmstadt, GERMANY; ²Tosoh Corporation, Shin-Nanyo, JAPAN; ³Tosoh Bioscience GmbH, Griesheim, GERMANY [presented by Werner Conze]

3:50 PM  (L-218) The Future of Protein A Affinity Chromatography. Hans Johansson¹, Patrick Gilbert², Mark Hicks², ¹Purolite, Uppsala, SWEDEN; ²Purolite, Llantrisant, UK


4:30 PM  (L-220) Inline Concentration of Monoclonal Antibody Feed to Increase the Productivity of a Continuous Multi-column Chromatography Capture Step. Thomas Elich, Herb Lutz, MilliporeSigma, Burlington, MA, USA

4:50 PM - 5:00 PM  Intermission

8A. Tuesday Parallel Session: Alternative Chromatographic Processes
Session Chair: Shuichi Yamamoto, Yamaguchi University
Location: Constellation Ballroom C, 2nd floor

5:00 PM  (L-221) 3-D Chromatography for Fab Fragment Purification. Matthias Kubek¹, Matthias Fink¹, Clemens Schimek¹, Cecile Brocard², Gerald Striedner¹, Monika Cserjan¹, Rainer Hahn¹, ¹BOKU Vienna, Vienna, AUSTRIA; ²Boehringer Ingelheim RCV GmbH & Co KG, Vienna, AUSTRIA


5:40 PM  (L-223) Development of Electro-Chromatography Methods and Application to Purification of Polymerized IgM. Xun Zuo, Gregory Sabatino, Eric Routhier, Manish Makhija, Zhanling Wang, Joye Bramble, Eisai, Exton, PA, USA

6:00 PM  (L-224) The Purification of Monoclonal Antibodies using Novel Chromatofocusing Methods. Yang Liu¹, Sevda Deldari¹, Hui Guo¹, Chittoor Narahari Rao², Ronald Bates³, Jay West⁴, Kathleen Trejo⁴, Ryan Swanson⁴, Sanchayita Ghose⁴, Zhengjian Li⁵, Douglas Frey¹, ¹University of Maryland Baltimore County, Baltimore, MD, USA; ²Moderna Therapeutics, Cambridge, MA, USA; ³Bristol-Myers Squibb, East Syracuse, NY, USA; ⁴Bristol-Myers Squibb, Devens, MA, USA

6:20 PM  Pause
**8B. Tuesday Parallel Session: Continuous Processes**  
Session Chair: Jose Paulo Mota, Universidade NOVA de Lisboa  
Location: Constellation Ballroom D, 2nd floor

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<tr>
<td>5:00 PM</td>
<td><strong>Continuous Downstream Purification of mAbs Enabled by Versatile Twin-Column Chromatography.</strong> James Angelo¹, Kathleen Mihlbachler², ¹Bristol-Myers Squibb, Devens, MA, USA; ²YMC Process Technologies, Devens, MA, USA</td>
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<td>5:20 PM</td>
<td><strong>Continuous Purifications in Multistep Continuous Flow Synthesis of Pharmaceutical Compounds.</strong> Robert Orkenyi¹,², ¹Budapest University of Technology and Economics, Budapest, HUNGARY; ²RotaChrom Technologies LLC, Dabas, HUNGARY</td>
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<td>6:00 PM</td>
<td><strong>Assuring Bioburden Control in Continuous Downstream Processing.</strong> Sandhya Manjunath¹, Ozan Otes², Hendrik Flato², Daniel Vazquez Ramirez², Britta Manser³, Marc Bisschops⁴, Florian Capito², ¹Pall Biotech, Westborough, MA, USA; ²Sanofi, Frankfurt, GERMANY; ³Pall Biotech, Basel, SWITZERLAND; ⁴Pall Biotech, Medemblik, NETHERLANDS</td>
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### 9. Wednesday Keynote Session: Peptides and Oligonucleotides

**Session Chair:** Olivier Dapremont, AMPAC Fine Chemicals  
**Location:** Constellation Ballroom C/D, 2nd floor

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| 8:30 AM | (L-301) **Breaking the Yield-purity Trade-off in Preparative Purification of Peptide and Oligonucleotides using Twin-column Chromatography.**  
Thomas Muller-Spath¹, Massimo Morbidelli², ¹ETH Zurich & ChromaCon, Zurich, SWITZERLAND; ²ETH Zurich, Zurich, SWITZERLAND |
| 8:50 AM | (L-302) **Industrial Peptide Purification – Challenges and Concepts.** Ralf Eisenhuth,  
Bachem AG, Bubendorf, SWITZERLAND |
| 9:10 AM | (L-303) **Practical Application of a Model based Approach for Small Molecules and API/Intermediates within Johnson Matthey's Manufacturing Operations.** Paul O'Shaughnessy,  
Johnson Matthey Health, Reading, UK |
| 9:30 AM | (L-304) **Preparative Supercritical Fluid Chromatography Separation of Peptides: On the Issue of Solubility and Robustness.** Joakim Bagge¹, Martin Enmark¹, Marek Lesko¹, Emelie Glenne¹, Linda Thunberg¹, Annika Langborg Weinmann², Tomas Leek², Hanna Leek², Fredrik Lime³, Jorgen Samuelsson⁴, Torgny Fornstedt⁵, ¹Karlstad University, Karlstad, SWEDEN; ²AstraZeneca, Gothenburg, SWEDEN; ³Nouryon, Bohus, SWEDEN |
| 9:50 AM | (L-305) **Investigation of Impurity Profiles in Preparative HPLC Applications of Peptide APIs.** Fredrik Lîme, Anneli Hermansson, Per Jageland, Therése Tran, Nouryon/Kromasil, Bohus, SWEDEN |
| 10:10 AM | **Presentation of Awards to Winners of the Best Poster Competition** |

### 10. Wednesday Session: Fundamentals Applied to Understand Chromatography Columns

**Session Chair:** Chen Wang, AbbVie  
**Location:** Constellation Ballroom C/D, 2nd floor

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<tr>
<td>10:40 AM</td>
<td>(L-306) <strong>Increasing Protein Dynamic Binding Capacity By using Binding Affinity to Manipulate Surface Diffusivity.</strong> Ohnmar Khanal¹, Vijesh Kumar¹, Fabrice Schlegel², Abraham M. Lenhoff¹, ¹Department of Chemical and Biomolecular Engineering University of Delaware, Newark, DE, USA; ²Amgen Process Development One Kendall Square 360 Binney St., Cambridge, MA, USA</td>
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<td>11:00 AM</td>
<td>(L-307) <strong>Domain Contributions to Selectivity in Bispecific Antibody Purification by Multimodal Chromatography.</strong> Siddharth Parasnavis¹, Matthew Aspelund², Wai Keen Chung², Steven Cramer¹, ¹Rensselaer Polytechnic Institute, Troy, NY, USA; ²AstraZeneca, Gaithersburg, MD, USA</td>
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<td>11:20 AM</td>
<td>(L-308) <strong>Quantification of Unfolding and Aggregation of Monoclonal Antibodies on Cation Exchange Resins.</strong> Artur Stanczak¹, Krystian Baran², Izabela Poplewska², Dorota Antos², ¹Polpharma Biologics, Gdansk, POLAND; ²Rzeszow University of Technology, Rzeszow, POLAND</td>
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Wednesday, July 10, 2019

11:40 AM  (L-309) Quantifying the Importance of Radial Inhomogeneity in Preparative Chromatography Columns. Dmytro Iurashev, Anna Christler, Susanne Schweiger, Astrid Dürauer, Alois Jungbauer, Jürgen Zanghellini, Austrian Centre of Industrial Biotechnology, Vienna, AUSTRIA; University of Natural Resources and Life Sciences, Vienna, AUSTRIA

12:00 PM  (L-310) Implementation of a Generic Approach to Simplify Column Packing and Testing. Arvid Rehm, Rentschler Biopharma SE, Laupheim, GERMANY

12:20 PM - 2:00 PM  Lunch Break

11. Wednesday Session: Monoliths and Membrane Chromatography
Session Chairs: Sebastian Vogg, ETH Zurich and Yiran Wang, University of Virginia
Location: Constellation Ballroom C/D, 2nd floor

2:00 PM  (L-311) Rapid and Effective Separation of Targeting Glycoproteins using a Macroporous Sponge-monolith Modified with Lectins in Liquid Chromatography. Takuya Kubo, Seiya Kato, Tetsuya Tanigawa, Toyohiro Naito, Koji Otsuka, Kyoto University, Kyoto, JAPAN; Chemco Scientific Co. Ltd., Osaka, JAPAN

2:20 PM  (L-312) Monolithic Chromatography Strategies for the Purification of CD133+ Stem Cells. Mirna Gonzalez-Gonzalez, Erika Arias, Karla Mayolo-Deloisa, Richard C. Willson, Marco Rito-Palomares, Tecnologico de Monterrey, Monterrey, MEXICO; Northwestern University, Chicago, IL, USA; University of Houston, Houston, TX, USA

2:40 PM  (L-313) Simultaneous Purification and Break-through Curve Analysis of Macromolecules on a Single Akta System. Rok Ambrozic, Petra Modic, Gorazd Hribar, Ales Podgornik, Faculty of Chemistry and Chemical Technology, Ljubljana, SLOVENIA; Lek d.d. Technical Development Biologics, Menges, SLOVENIA

3:00 PM  (L-314) Chromassette™, A 3D Printed Device, Contains a Lattice Structure Allowing for Enhanced Purification of Biologics on Previously Unachievable, Higher Performance Resins. Kristi Haskins, Tomonori Shiotani, Yusaku Mizuguchi, Masayoshi Nagaya, JSR Life Sciences, Sunnyvale, CA, USA

3:20 PM  (L-315) Harvesting with Chromatography-improved Protein A Performance in Batch and Continuous Processes. Chris Koehler, Hani El Sabbahy, Angelines Castro, 3M, St. Paul, MN, USA

3:40 PM - 4:10 PM  Break
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| 4:10 PM | (L-316) **Two-Step Purification Process for H1N1 Virus using Ion Exchange Resins.**
|        | Duy Tien Ta, Kai Ling Chu, Wei Zhang, Bioprocessing Technology Institute A*STAR, Singapore, SINGAPORE |
| 4:30 PM | (L-317) **Purification of Plasmid DNA for Gene Therapy and Genetic Vaccination.**
|        | Carsten Voss, Bio-Rad Laboratories GmbH, Munich, GERMANY                |
| 4:50 PM | (L-318) **A Scalable Adenovirus Production Process, from Cell Culture to Purified Bulk.**
|        | Asa Hagner McWhirter, Magnus Bergman, Eva Blanck, Sara Haggblad-Sahlberg, Pelle Sjoholm, Maria Soultzioti, Sravani Musunuri, Anna Akerblom, Asa Lagerlof, Mats Lundgren, GE Healthcare, Uppsala, SWEDEN |
| 5:10 PM | (L-319) **Major Histocompatibility Complex Class II Multi-epitope Insert Improves Anion Exchange Chromatography Purification of Human Papilloma Virus 16 L1 Protein Expressed in E. coli without Affecting Folding Efficiency.**
|        | Kyle Saylor¹, Alison Waldman², Frank Gillam³, Chenming Zhang¹, ¹Virginia Tech, Blacksburg, VA, USA; ²North Carolina State University, Raleigh, NC, USA; ³Grifols, Durham, NC, USA |
| 5:30-5:40 PM | **CLOSING REMARKS**, Giorgio Carta, University of Virginia, Charlottesville, VA, USA |
| 5:40 PM | **FAREWELL MIXER**
|        | PREP & ISPPP shared Mixer in ISPPP Exhibit/Poster Hall                |
|        | Location: Constellation Ballroom E/F, 2nd floor                       |

*12. Wednesday Session: Applications to Virus, VLPs, and Plasmid Purification*

Session Chair: Ales Podgornik, COBIK, Ljubljana
Location: Constellation Ballroom C/D, 2nd floor
**Poster Session 1 - Monday 2:00 - 3:20 PM**

Posters in the P-100 series will be presented on Monday in Poster Session I @ 2:00 - 3:20 PM

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See link to ‘Poster Guidelines’ under Posters at PREPsymposium.org

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**P-M-101**

Collection of Peptide Drug and On-column Concentration with Ultra-fast Preparative Purification Liquid Chromatograph. Yoshiyuki Watabe, Kosuke Nakajima, Yoshihiro Hayakawa, Shimadzu Corporation, Kyoto, JAPAN

**P-M-102**

Development of an Integrated Harvest and Process Chromatography Tool-box for High-cell Density E.Coli, Yeast, and Mammalian Cell Cultures. Paul Gahr, Gerald Terfloth, Antonio Ubiera, GlaxoSmithKline, Upper Merion, PA, USA

**P-M-103**


**P-M-104**

HPMA as Carrier of 3-3-diindolylmethane Derivate: its Conjugation and Purification Process. Eddie Robles-Garza, Calef Sanchez-Trasvina, Fabiola Castorena-Torres, Karla Mayolo-Deloisa, Marco Rito-Palomares, Tecnologico de Monterrey, Monterrey, MEXICO

**P-M-105**

Structure and Protein Adsorption Behavior of CaptoTM Core 700 Resin. Calef Sanchez-Trasvina¹, Preston Fuks², Christiane Mushagasha², Karla Mayolo-Deloisa¹, Marco Rito-Palomares¹, Giorgio Carta₂, ¹Tecnologico de Monterrey, Monterrey, MEXICO; ²University of Virginia, Charlottesville, VA, USA

**P-M-106**


**P-M-107**

Pesticide Classification System in the Isolation of Cannabidiol using Centrifugal Partition Chromatography. Arpad Konczol¹, Dora Rutterschmid¹, Robert Orkenyi¹,², ¹Budapest University of Technology and Economics, Budapest, HUNGARY; ²RotaChrom Technologies LLC, Dabas, HUNGARY

**P-M-108**

Error Modeling in Chromatography and Parameter Confidence. William Heymann, Eric von Lieres, Forschungszentrum Julich, Julich, GERMANY

**P-M-109**

Continuous Capture Chromatography as an Integrated Downstream Purification Platform for mAbs. Jared Steffy¹, Lindsay Arnold¹, Kathleen Mihlbachler², ¹MedImmune, Gaithersburg, MD, USA; ²YMC Process Technologies, Devens, MA, USA

**P-M-110**

Isolation of Pharmaceutical Degradants using Supercritical Fluid Chromatography (SFC). Paul Lefebvre, Alexander Neue, Cindy Berger, Heather Lane, Averica Discovery Services, Marlborough, MA, USA

**P-M-111**

Semi-prep FcR Column for Separation of Monoclonal Antibody based on the Differences of N-glycans. Ryoko Otake, Yesuke Terao, Tosoh Corporation, Ayase, JAPAN

**P-M-112**

Protein A Chromatography as a Polishing Step in a Downstream Bioprocess? Ehsan Espah Borujeni, William Rayfield, Sandra Rios, Merck Co. & Inc., Kenilworth, NJ, USA
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| P-M-113 | **Development of a Novel Fiber-based Chromatography Platform to Break Downstream Bottlenecks.** Ian Scanlon¹, Oliver Hardick¹, Peter Guterstam², Linnea Troeng², Lotta Hedkvist³, Penny Hamlyn², Peter Lundback², John Jenco⁴, GE Healthcare, Stevenage, UK; GE Healthcare, Uppsala, SWEDEN; GE Healthcare, Little Chalfont, UK; GE Healthcare, Marlborough, MA, USA |
| P-M-114 | **Scale Up of a Chromatographic Capture Step for a Clarified Bacterial Homogenate – Influence of Feed Viscosity and Competitive Adsorption of Impurities.** Michal Kolodziej¹, Dominik Sauer², Juergen Beck³, Wojciech Marek¹, Rainer Hahn², Astrid Duerauer², Alois Junbauer³, Wojciech Piatkowski¹, Dorota Antos¹, Rzeszow University of Technology, Rzeszow, POLAND; Austrian Centre of Industrial Biotechnology, Vienna, AUSTRIA; Department of Biotechnology, Vienna, AUSTRIA |
| P-M-115 | **Prediction of Peak Variances and Mass Transfer Coefficients in Linear pH and Salt Gradient Elution.** Jan Hedrich¹, Romas Skudas¹, Michael M. Schulte², Christian Frech¹, ¹University of Applied Sciences, Mannheim, GERMANY; ²Merck KGaA, Darmstadt, GERMANY |
| P-M-116 | **Modeling and Process Development for Protein Separation by Flow-through Chromatography.** Chyi-Shin Chen, Sumiko Hasegawa, Noriko Yoshimoto, Shuichi Yamamoto, Biomedical Engineering Center (YUBEC) Yamaguchi University, Ube, JAPAN |
| P-M-117 | **Use of 3D Printing to Improve Plug-flow Recycling in Batch Chromatography with Recycle Lag.** Abimaelle Chiberio, Gonçalo Policarpo, Tiago Santos, João Antunes, José Paulo Mota, NOVA University of Lisbon, Lisbon, PORTUGAL |
| P-M-118 | **Exploiting the Analogy between Carbon Nanotubes and Proteins to Develop Novel Separation Methods.** Payam Rezaei¹, Lisa Pfefferle², Douglas Frey¹, ¹University of Maryland Baltimore County, Baltimore, MD, USA; ²Yale University, New Haven, CT, USA |
| P-M-119 | **Recombinant Protein Purification from E. coli Fermentate with Mixed-mode Chromatography Resins.** William Rushton¹, David Frisch², Hyunsic Choi², ¹Bio-Rad Laboratories, Hercules, CA, USA; ²Scarab Genomics, Madison, WI, USA |
| P-M-120 | **Recombinant Monoclonal Antibody – Rituximab Biosimilar – Alternate Non-affinity based Chromatographic Purification Process.** Anton Posch¹, Chelsea Pratt², Laura Moriarty², Payal Khandelwal², Jiali Liao², ¹Bio-Rad Laboratories, Munich, GERMANY; ²Bio-Rad Laboratories, Hercules, CA, USA |
| P-M-121 | **Elucidation of Retention Behaviors in Reversed-phase Liquid Chromatography as a Function of Mobile Phase Composition.** Hung-Wei Tsui, Che-Hung Kuo, Yung-Chen Huang, National Taipei University of Technology, Taipei, TAIWAN |
| P-M-122 | **Preparative Separation of Phosphorothioated Antisense Oligonucleotides.** Martin Enmark¹, Joakim Bagge¹, Jorgen Samuelsson¹, Linda Thunberg², Hanna Leek², Fredrik Lime³, Per Jageland³, Torgy Fornstedt¹, ¹Karlstad University, Karlstad, SWEDEN; ²AstraZeneca, Gothenburg, SWEDEN; ³Nouryon, Bohus, SWEDEN |
| P-M-123 | **Hydrophobic Interaction Chromatography Cleaning to Achieve Facility Fit in a Next-gen Enzyme Manufacturing Facility: Considerations for Cycling Study Design.** Arjun Bhadouria, Mary Kilroy, Tari Vetter, Kevin Brower, Rohan Patil, Jason Walther, Sanofi, Framingham, MA, USA |
P-M-124  **Impact of Plant Cultivation on the Chromatographic Behavior of Host Cell Proteins Purified from Different Nicotiana Species.** Jan Wilhelm Huebbers¹, Catherine Rose Mueschen¹, Johannes Felix Buyel², ¹Fraunhofer Institute for Molecular Biology and Applied, Aachen, GERMANY; ²Institute for Molecular Biology RWTH Aachen University, Aachen, GERMANY

P-M-125  **Analysis of Chromatographic Column Performance during Resin Lifetime Studies using Data Mining Methods.** Chris Gerberich, Yanhong Feng, Sam Flores, Myles Boyd, André Dumetz, Gerald Terfloth, GlaxoSmithKline, King of Prussia, PA, USA

P-M-126  **Prediction of Protein Mixture Elution on Anion Exchangers.** Catherine Mueschen, Fraunhofer IME, Aachen, GERMANY

P-M-127  **Continuous Purifications in Multistep Continuous Flow Synthesis of Pharmaceutical Compounds.** Robert Orkenyi¹,², ¹Budapest University of Technology and Economics, Budapest, HUNGARY; ²RotaChrom Technologies LLC, Dabas, HUNGARY

P-M-128  **Improved Key Quality Attributes of Antibody Purification Processes.** Kajsa Eriksson, Cecilia Unoson, Lars Haneskog, Bio-Works, Uppsala, SWEDEN

P-M-129  **Mixed PEL Brush Modified Porous Chromatography Media for pH Modulated Protein Separations.** Thantawat Theeranan, Owen R.T. Thomas, University of Birmingham, Birmingham, UK

P-M-130  **Quantifying the Importance of Radial Inhomogeneity in Preparative Chromatography Columns.** Anna Christler¹, Dmytro Iurashev¹, Susanne Schweiger², Astrid Dürauer², Alois Jungbauer², Jürgen Zanghellini², ¹Austrian Centre of Industrial Biotechnology, Vienna, AUSTRIA; ²University of Natural Resources and Life Sciences, Vienna, AUSTRIA

P-M-131  **Advantage of Antibody Based Selectivity in the Purification of Biologics.** Jessica de Rooij¹, Frank Detmers¹, Pim Hermans¹, Hendrik Adams¹, Orjana Terova², ¹Thermo Fisher Scientific, Leiden, NETHERLANDS; ²Thermo Fisher Scientific, Bedford, MA, USA

P-M-132  **From Preparative Batch Chromatography to a 2-Column Multicolumn Countercurrent Solvent Gradient Purification (MCSGP) Process for the Purification of a Peptide Crude Mixture.** Chiara De Luca¹, Sebastian Vogg², Martina Catani¹, Marco Macis³, Antonio Ricci³, Alberto Cavazzini³, Massimo Morbidelli², ¹University of Ferrara, Ferrara, ITALY; ²ETH Zurich, Zurich, SWITZERLAND; ³Fresenius Kabi iPSUM, Villadose (RO), ITALY

P-M-133  **Separation of Empty and Full Adeno-Associated Viral Vectors (AAV) using Scalable Ion Exchange Chromatography.** Chris Argento, Ryan Dickerson, Meisam Bakhshayeshi, Biogen, Cambridge, MA, USA

P-M-134  **Flash Purification Methodology for Synthetic Peptides.** Marc Jacob, J Preston, Phenomenex, Torrance, CA, USA

P-M-135  **A Robust Study in Column Packing of Amsphere A3 from Lab to Manufacturing Scale.** Tomonori Shiotani¹, Yusaku Mizuguchi¹, Kristi Haskins¹, Jason Chiu², Masayoshi Nagaya², Kaori Itaya², Ryo Do², Gerald Platteau², ¹JSR Life Sciences, NC, USA; ²JSR Life Sciences, JAPAN; ³JSR Life Sciences, BELGIUM
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<td>Breaking the Yield-Purity Trade-off in Preparative Purification of Peptide and Oligonucleotides.</td>
<td>Thomas Muller-Spath¹, Richard Weldon¹, Massimo Morbidelli², ¹YMC ChromaCon, Zurich, SWITZERLAND; ²ETH Zurich, Zurich, SWITZERLAND</td>
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<td>Regularities and Anomalies in Modeling Protein Elution in ion-exchange Chromatography.</td>
<td>Vijesh Kumar¹, Fabrice Schlegel², Oliver Kaltenbrunner², Abraham Lenhoff¹, ¹University of Delaware, Newark, DE, USA; ²Amgen, Cambridge, MA, USA</td>
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<td>P-M-138</td>
<td>Spreading Kinetic Model for mAb Monomer-Dimer Mixtures on Ceramic Hydroxyapatite.</td>
<td>Yiran Wang, Giorgio Carta, University of Virginia, Charlottesville, VA, USA</td>
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<td>Evaluation the Control of Host Cell Proteins (HCPs) in a NS0 Cell Bioprocess.</td>
<td>Juan Wang, Bristol-Myers Squibb, Devens, MA, USA</td>
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<td>Rapid Sanitization of Protein A Resin in Bioprocess Columns using a Sporicidal Agent.</td>
<td>Johan Avallin¹, Anders Nilsson¹, Henrik Ingvarrson¹, Anna Gronberg¹, Magnus Asplund¹, Eva Blanck¹, Linda Persson¹, Reinhard Braaz², Joseph Vinnemeier², Philip Lester², ¹GE Healthcare, Uppsala, SWEDEN; ²Roche, Penzberg, GERMANY</td>
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<td>P-M-141</td>
<td>Improving mAbs Purification Process using a High Capacity Anion Exchange Resin Coupled with Buffer Modulation.</td>
<td>Quanxuan Zhang, Rudrajit Mal, Bhaktavachalam Thiyagarajan, Nandu Deorkar, Avantor, Bridgewater, NJ, USA</td>
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<td>P-M-142</td>
<td>Modification of Sarkosyl Concentration to Facilitate Virus like Particle (VLP) Purification through Diethylaminoethyl (DEAE) Chromatography.</td>
<td>Yi Lu, Frank Gillam, Chenming Zhang, Virginia Tech, Blacksburg, VA, USA</td>
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<td>P-M-143</td>
<td>Fast and Easy Injection of Large Sample Volumes in Preparative HPLC.</td>
<td>Ronald Guilliet¹, Florian Rieck², ¹Agilent, Middelburg, NETHERLANDS; ²Agilent, Waldbronn, GERMANY</td>
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<td>P-M-144</td>
<td>Organic Phase Injection in Reversed Phase Liquid Chromatography for High-Concentration Samples.</td>
<td>Ronald Guilliet¹, Lena Höninger², Florian Rieck², ¹Agilent, Middelburg, NETHERLANDS; ²Agilent, Waldbronn, GERMANY</td>
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<td>P-M-145</td>
<td>Biomacromolecule Separation using Sepax Monomix MC SEC Bulk Media.</td>
<td>Huiming Mao¹, Ke Yang¹, Xueying Huang¹, Huhua Chen², Xinmei Hu², ¹Sepax Technologies, Inc., Newark, DE, USA; ²Sepax Technologies, Inc., Suzhou, CHINA</td>
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<td>P-M-146</td>
<td>Downstream Process Development of Monoclonal Antibodies in High-yield and High-purity by Affinity and Ion-exchange Chromatography.</td>
<td>Masatoshi Taniguchi¹, Tetsuo Fukuta², Kaori Itaya², Makoto Higami², Masaaki Hanamura², Noritaka Kuroda¹, Naohiro Kuriyama¹, ¹YMC Co., Ltd., Kyoto, JAPAN; ²JSR Corporation, Tokyo, JAPAN [presented by Jeffrey Kakaley]</td>
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<td>P-M-147</td>
<td>Viral Clearance Strategy for POROS Hydrophobic Interaction Chromatography.</td>
<td>John Li¹, Moira Lynch¹, David Cetlin², Stephen Stoltzfus³, Abbie Hevner³, Nicholas Decandia³, Jessica De Rooij¹, Orjana Terova¹, ¹Thermo Fisher Scientific, Bedford, MA, USA; ²Mock V Solutions, Rockville, MD, USA; ³Eurofins Lancaster Laboratories, Lancaster, PA, USA</td>
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<td>P-M-148</td>
<td>Increased Productivity with Single-use Membrane Chromatography.</td>
<td>Daniela Soluk¹, Ricarda Busse², ¹Sartorius Stedim Biotech, Bohemia, NY, USA; ²Sartorius Stedim Biotech, Gottingen, GERMANY</td>
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P-M-149  **Characterization of Tryptamine-coupled Resin for Affinity Purification of Human IgG.** H. Michelle Rakotondravao¹, Ayaka Ohara¹, Naohiro Kuriyama², Noritaka Kuroda², Masatoshi Taniguchi², Yumiko Sakoda², Jun-Ichi Horiuchi¹, Yoichi Kumada¹, ¹Kyoto Institute of Technology, Kyoto, JAPAN; ²YMC, Kyoto, JAPAN

P-M-150  **Reversible, Three-peak Elution Behavior of Bivalent Bispecific Antibodies on Hydrophobic Interaction Chromatography Columns.** Lucas Kimerer¹, Timothy Pabst², Alan Hunter², Giorgio Carta¹, ¹University of Virginia, Charlottesville, VA, USA; ²AstraZeneca, Gaithersburg, MD, USA

P-M-151  **Continuous Monitoring of Antibody Column Breakthrough by Fluorescence Polarization and Fluorescence Intensity.** Ujwal Patil, Mary Crum, Binh Vu, Katerina Kourentzi, Richard C. Willson, University of Houston, Houston, TX, USA

P-M-152  **Osmolality is a Predictor for Model based Real Time Monitoring of Concentration in Protein Chromatography.** Edit Feldfödi¹, Therese Scharl-hirsch¹, Astrid Duerauer², Kristeena Wright³, Alois Jungbauer², ¹acib, Vienna, AUSTRIA; ²BOKU, Vienna, AUSTRIA; ³Alcomapnies, Norwood, MA, USA

P-M-153  **Dispersive Pipette Extraction for 3-5 mL Sample Volumes using Automated Liquid Handling Systems to Increase Purification Throughput.** P. Nikki Sitasuwan, Todd Mullis, Huey Nguyen, L. Andrew Lee, IMCS, Inc., Irmo, SC, USA

P-M-154  **Preparation of Tertiary Amine Functionalized Sepharose Fast Flow Resins.** Tingyu Li¹, David Vanderah², ¹National Science Foundation, Alexandria, VA, USA; ²NIST IBBR, Rockville, MD, USA

P-M-155  **HIV Aids Test Report for the People of Geita Region – Tanzania.** Vivian Bengesi, Geita Regional Hospital, Geita, TANZANIA

P-M-156  **Practical Application of a Model Based Approach to Process Chromatography for Small Molecules and API/Intermediates within Johnson Matthey Health’s Manufacturing Operations.** Paul O’Shaughnessy¹, Adam Turner², ¹Johnson Matthey Technology Centre, Reading, UK; ²Johnson Matthey Heath, Devens, MA, USA
P-T-201  Three Unique Cation Exchange Resins Sharing a Common Base Bead.  
Joaquin Umana, Matthew T. Stone¹, Romas Skudas², Peter Menstell², Heiner Graalts³,  
¹MilliporeSigma, Bedford, MA, USA; ²Merck KGaA, Darmstadt, GERMANY

P-T-202  Penetrating and Non-penetrating Tracer for the Empiric Determination of Column  
Porosities used in Chromatography Modelling – A Long and Winding Road.  
Catherine Müschen, Ronald Jäpel, Johannes Buyel, Fraunhofer IME, Aachen, GERMANY

P-T-203  Purification of Infectious Adenovirus using Ceramic Hydroxyapatite Column.  
Yae Kurosawa, HOYA Technosurgical Corporation, Tokyo, JAPAN

P-T-204  A Fully Scalable Platform for the Production and Purification of Magnetosomes.  
Hong Li¹, Alfred Fernández-Castané², Moritz Eberle³, Matthias Franzreb³, Tim W.  
Overton¹, Owen R.T. Thomas¹, ¹University of Birmingham, Birmingham, UK; ²Aston University, Birmingham, UK; ³Karlsruhe Institute of Technology, Karlsruhe, GERMANY

P-T-205  Reduce Risk of Failure in Virus Clearance Studies using Robust Scale-down  
Chromatography Tools.  Tina Pitarresi, Linnea Troeng, GE Healthcare, Uppsala, SWEDEN

P-T-206  Rapid Resolution of Isomers from Chiral Molecules with Multiple Stereocenters.  
Paul Lefebvre, Alexander Neue, Cindy Berger, Heather Lane, Averica Discovery  
Services, Marlborough, MA, USA

P-T-207  Influenza Virus Capture using Membrane Chromatography: Improving Selectivity  
by Matrix Design and Pseudo-affinity Ligand Interactions.  Florian Taft¹, Ana Raquel  
Fortuna¹, Michael Wolff², Udo Reich³, Volkmar Thom¹, ¹Sartorius Stedim GmbH,  
Goettingen, GERMANY; ²Institute of Bioprocess Engineering and Pharmaceutical Technology, University of Applied Sciences Mittelhessen and Max Planck Institute for Dynamics of Complex Technical Systems, Giessen, GERMANY; ³Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, GERMANY

P-T-208  Flocculation and Synthetic Depth Filtration for Increased Purity and Reduced  
Turbidity of a mAb Product.  Dominick Groux, George Weeden, Adam Meizinger, Carl  
Beigie, Sanofi Genzyme, Framingham, MA, USA

P-T-209  Purification of a Recombinant Bacterial DyP-peroxidase with a Hydrophobic Anion  
Exchange Resin.  Nikola Loncarib¹, Natasa Bozica², Marinela Sokarda Slavica², Marco  
Fraaije¹, Zoran Vujcic², Payal Khandelwal¹, ¹University of Groningen, Groningen,  
NETHERLANDS; ²University of Belgrade, Belgrade, SERBIA; ³Bio-Rad Laboratories,  
Hercules, CA, USA

P-T-210  Mitigation of Protein Transport Limitations during Multimodal Chromatography  
Process Development.  Stijn Hendrik Simon Koshari, Hong Zhang, Robert G Luo,  
GlaxoSmithKline, King of Prussia, PA, USA

P-T-211  Did You Know that Magnetic Separation for Proteins does not have to be  
Expensive?  Silvia Blank-Shim, Sebastian Schwaminger, Alexander Zanker, Paula Fraga  
García, Sonja Berensmeier, Technical University of Munich, Garching, GERMANY

P-T-212  Efficient Protection of Protein A Resins during mAb Purifications.  Cecilia Unoson,  
Kaisa Eriksson, Lars Haneskog, Bio-Works, Uppsala, SWEDEN
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<td>Chromalite M: A Novel Range of Methacrylic Polymers with High Performance in Chromatographic Bio-Separations</td>
<td>Benjamin Summers, Alessandra Basso, Simona Serban, Purolite Ltd., Llantrisant, UK</td>
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<td>P-T-214</td>
<td>Automated End-to-end Integrated Manufacturing of an Antibody</td>
<td>Sebastian Vogg, Moritz Wolf, Fabian Feidl, Nicole Ulmer, Ruben Wälchli, ETH Zurich, Zurich, SWITZERLAND</td>
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<td>P-T-215</td>
<td>Assuring Bioburden Control in Continuous Downstream Processing</td>
<td>Ozan Otes, Hendrik Flato, Daniel Vazquez-Ramirez, Britta Manser, Marc Bisschops, Florian Capito, Sandhya Manjunath, Sanofi-Aventis, Frankfurt, GERMANY; Pall Biotech, Basel, SWITZERLAND; Pall Biotech, Medemblik, NETHERLANDS; Pall Biotech, Westborough, MA, USA</td>
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<td>P-T-216</td>
<td>Sample Loadability on Coated and Immobilized Polysaccharide-Based CSPs</td>
<td>Gay Lowden, Edward Franklin, Regis Technologies, Inc., Morton Grove, IL, USA</td>
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<td>Purification of Protein Solutions based on Diffusion through a Thin Liquid Barrier using Continuous SPLITT Fractionation System</td>
<td>Soheyl Tadjiki, Robert Reed, Postnova Analytics, Salt Lake City, UT, USA</td>
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<td>P-T-218</td>
<td>Reversible Three Peak Behavior of Bivalent Bispecific Antibodies on Cation Exchange Columns</td>
<td>Lucas Kimmer, Tim Pabst, Alan Hunter, Giorgio Carta, University of Virginia, Charlottesville, VA, USA; AstraZeneca, Gaithersburg, MD, USA</td>
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<td>P-T-220</td>
<td>Modeling the Nonlinear Behavior of a Bioactive Peptide in Reversed-Phase Gradient Elution Chromatography</td>
<td>Martina Catani, Chiara De Luca, Simona Felletti, Marco Macis, Antonio Ricci, Massimo Morbidelli, Alberto Cavazzini, University of Ferrara, Ferrara, ITALY; Fresenius Kabi iPSUM, Villadose (Rovigo), ITALY; ETH Zurich, Zurich, SWITZERLAND</td>
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<td>P-T-221</td>
<td>Chromassette™, A 3D Printed Device, Contains a Lattice Structure Allowing for Enhanced Purification of Biologics on Previously Unachievable, Higher Performance Resins.</td>
<td>Kristi Haskins, Tomonori Shiotani, Yusaku Mizuguchi, Masayoshi Nagaya, JSR Life Sciences, Durham, NC, USA; JSR Life Sciences, Sunnyvale, CA, USA</td>
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<td>P-T-222</td>
<td>Peak Deconvolution of Multicomponent Protein Mixtures: A Method to Rapidly Determine Product Retention and Identify Orthogonal Chromatographic Steps.</td>
<td>Scott Alter, Nicholas Vecchiarelli, Camille Bilodeau, Steven Cramer, Rensselaer Polytechnic Institute, Troy, NY, USA; Amgen, Cambridge, MA, USA</td>
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<td>P-T-223</td>
<td>Brining Down the Cost of MAb Purification with a New Protein A Resin and Intensified Batch Processing.</td>
<td>Hans Johansson, Purolite, Uppsala, SWEDEN</td>
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<td>P-T-224</td>
<td>SFC Isolation of THCA and CBD from Cannabis using a New Developed Chromatography Column.</td>
<td>Matthew Przybycie, ES Industries, West Berlin, NJ, USA</td>
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<td>A Hydrophobic Anion Exchange Resin for Refined Selectivity and Recovery.</td>
<td>Xuemei He, Irene Chen, Louisa Vang, Walt Eggert, Mark A. Snyder, Bio-Rad, Hercules, CA, USA</td>
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<td>P-T-226</td>
<td>Understanding Fouling Mechanisms of Direct Filtration during Process Development for Monoclonal Antibody Harvest.</td>
<td>Hong Zhang, Stijn Koshari, Kusum Solanki, Hiren Ardesna, Robert Luo, GlaxoSmithKline, King of Prussia, PA, USA</td>
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<td>P-T-227</td>
<td>Understanding Tangential Flow Filtration Behavior of Antibody-Drug Conjugates.</td>
<td>Ryan Bean, Michaela Wendeler, Kelly Wilson, James Howard, AstraZeneca, Gaithersburg, MD, USA</td>
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<td>P-T-228</td>
<td>Preparative Supercritical Fluid Chromatography Separation of Peptides: On the Issue of Solubility and Robustness.</td>
<td>Joakim Bagge¹, Martin Enmark¹, Marek Lesko¹, Emelie Glenne¹, Linda Thunberg², Annika Langborg Weinmann², Tomas Leek², Fredrik Limé³, Jörgen Samuelsson¹, Torgny Fornstedt¹, ¹Karlstad University, Karlstad, SWEDEN; ²AstraZeneca, Gothenburg, SWEDEN; ³Nouryon, Bohus, SWEDEN</td>
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<td>P-T-229</td>
<td>Viral Clearance Validation for Two-Column Continuous Protein A Chromatography.</td>
<td>Kevin Potter¹, James Angelo¹, Srinivas Chollangi¹, Anthony Cura¹, Thomas Muller-Spath², Simona Jusyte³, Xunkuo Xu¹, Sanchayita Ghose¹, ¹Bristol-Myers Squibb, Devens, MA, USA; ²ChromaCon, Zurich, SWITZERLAND; ³Wuxi Apptec, Philadelphia, PA, USA</td>
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<td>P-T-231</td>
<td>An Efficient Process for Mass Directed Reverse Phase Purification of Peptide Libraries for Drug Discovery.</td>
<td>Adam Beard¹, Miroslawa Darlak¹, Lisa Nogle¹, David Smith¹, Spencer McMinn¹, Mark Pietrafitta¹, Sharon Wilhelm², Erik Streckfuss³, Blair Zartman³, Michael Garrigou¹, Nicolas Boyer¹, Min Liu⁴, Helen Mitchell⁵, Nunzio Sciammetta¹, ¹Merck, Boston, MA, USA; ²Merck, Cambridge, MA, USA; ³Merck, West Point, PA, USA; ⁴Merck, Kenilworth, NJ, USA</td>
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<td>P-T-233</td>
<td>Protein Equilibrium Adsorption and Kinetics on Multimodal Anion Exchange Chromatography Resins.</td>
<td>Joey Roberts, Giorgio Carta, University of Virginia, Charlottesville, VA, USA</td>
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<td>P-T-234</td>
<td>DBC Study of Daisogel AF Series.</td>
<td>Masashi Jousha, Kazu Kudo, Tetsuyuki Saika, DAISO Fine Chem USA, Inc., Torrance, CA, USA</td>
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<td>P-T-235</td>
<td>Efficient mAb Purification in Flow through – Flow through Mode with Cellulose based Chromatography Resins (Cellufine™).</td>
<td>Kojiro Soda¹, Yoshihiro Matusmoto¹, Tsuyoshi Nakama¹, Shigeyuki Aoyama², ¹JNC Corporation, Yokohama, JAPAN; ²JNC Corporation, Tokyo, JAPAN</td>
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<td>P-T-236</td>
<td>Preparation of 4000-6000 Angstrom Pore-sized Gigaporous Anion Exchange Chromatography Resin and Its Application for Oncolytic Virus Purification.</td>
<td>Jinsong Liu¹, Baisheng Jin², Shengyue Lin², Rongji Chen², Biwang Jiang², ¹Suzhou Nanomicro Technologies Company Ltd., Hopkinton, MA, USA; ²Suzhou Nanomicro Technologies Company, Suzhou, CHINA</td>
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<td>Increasing Protein Dynamic Binding Capacity by using Binding Affinity to Manipulate Surface Diffusivity.</td>
<td>Ohnmar Khanal¹, Vijesh Kumar¹, Fabrice Schlegel², Abraham Lenhoff¹, ¹University of Delaware, Newark, DE, USA; ²Amgen, Cambridge, MA, USA</td>
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<td>P-T-238</td>
<td>Virus Clearance with Continuous Multi Column Chromatography.</td>
<td>Jason Forte¹, Mark Pagkaliwangan¹, Meng-Jung Chiang², Scott Lute², Denis Kole¹, Krunal Mehta³, Glen Bolton³, Mark Schofield³, Kurt Brorson³, ¹Pall Biotech, Westborough, MA, USA; ²U.S. Food and Drug Administration, Silver Spring, MD, USA; ³Amgen, Cambridge, MA, USA</td>
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<td>P-T-239</td>
<td>Accelerating Antibody Drug Development with Subdomain-Specific Affinity Ligands.</td>
<td>Pim Hermans¹, Frank Detmers¹, Bruce Dawson², ¹Thermo Fisher Scientific, Leiden, NETHERLANDS; ²Thermo Fisher Scientific, Wilmington, NC, USA</td>
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<td>P-T-241</td>
<td>Novel Polymer-type Through-porous Particles as Purification Media for IgG.</td>
<td>Ryosuke Takahashi¹, Ryota Wada¹, Emi Ichihashi¹, Masatoshi Taniguchi¹, Noritaka Kuroda¹, Naohiro Kuriyama¹, Norio Ishizuka², ¹YMC Co., Ltd., Kyoto, JAPAN; ²Emaus Kyoto Inc., Kyoto, JAPAN</td>
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<td>P-T-242</td>
<td>The Impact of Pore Size and Selectivity for Reversed Phase Purification of Insulin.</td>
<td>Priya Jayaraman¹, Sami Chanaa¹, Andrew Coffey², Ronald Guilliet³, ¹Agilent Technologies, Wilmington, DE, USA; ²Agilent Technologies, Church Stretton, UK; ³Agilent Technologies, Middelburg, NETHERLANDS</td>
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<td>P-T-243</td>
<td>Scouting, Purification, and Re-analysis on a Combined Analytical and Preparative LC/MS System.</td>
<td>Ronald Guilliet¹, Florian Rieck², Irina Spuling², ¹Agilent, Middelburg, NETHERLANDS; ²Agilent, Waldbronn, GERMANY</td>
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<td>P-T-244</td>
<td>Development of a 2-Step Liraglutide Purification Process on a Single Stationary Phase.</td>
<td>Marc Jacob, Phenomenex, Torrance, CA, USA</td>
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<td>P-T-245</td>
<td>Polymeric Ion Exchange Process Media for Bio-molecule Separation with High Resolution.</td>
<td>Ke Yang¹, Xinmei Hu², Huiming Mao¹, Xueying Huang¹, ¹Sepax Technologies, Inc., Newark, DE, USA; ²Sepax Technologies, Inc., Suzhou Jiangsu, CHINA</td>
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<td>P-T-246</td>
<td>Biomacromolecule Separation using Sepax PolyRP Bulk Media.</td>
<td>Huiming Mao¹, Ke Yang¹, Xueying Huang¹, Yi Wang², Xinmei Hu², ¹Sepax Technologies, Inc., Newark, DE, USA; ²Sepax Technologies, Inc., Suzhou, CHINA</td>
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P-T-247 Methods for Detecting Unfolding of Monoclonal Antibodies on Cation Exchange Resins. Artur Stanczak1, Krystian Baran2, Bartlomiej Filip2, Dorota Antos2. 1Polpharma Biologics, Gdansk, POLAND; 2Politechnika Rzeszowska, Rzeszow, POLAND

P-T-248 Centrifugal Partitioning Chromatography (CPC) for Isolation of Cannabinoids from Cannabis Extracts. Robert Driscoll, Robatel Inc., Pittsfield, MA, USA

P-T-249 Implementation of Simulated Moving Bed (SMB) Chromatography in Continuous Vaccine Processing. Tiago Matos, David Hoving, Adam Kristopeit, Marc Wenger, Merck & Co., Inc., West Point, PA, USA

P-T-250 High Throughput Screening Investigation of Flowthrough HIC. Allyson Tucker, Joanne Gilchrist, Bradford Stanley, Biogen, RTP, NC, USA

P-T-251 Agilent InfinityLab Purification Solutions: Automated Delay Time Calibration for UV and MS Peak-based Fraction Collection. Gina Black, Agilent, Cranford, NJ, USA

P-T-252 Development of In Silico Tools to Predict the Behaviour of Monoclonal Antibodies in POROS™ XS Cation Exchange Chromatography. Shamma Mehnaz1, Rhesa Budhidarmo1, Mary Lunson1, Simeon Georgiev2, Olga Obrezanova2, Jean Aucamp1, 1Lonza Biologics Plc, Slough, UK; 2Lonza Biologics Plc, Cambridge, UK

P-T-253 Comparability of a High Throughput Parallel Purification System (HTPPS) to a Traditional Fast Purification Liquid Chromatography (FPLC) System for Downstream Process Development. George Enriquez, Drew Keefe, Takeda, Lexington, MA, USA

P-T-254 Versatility of Automated Micropurifications using INtip Affinity, Desalting, and Ion Exchange for Early Process Screening. P. Nikki Sitasuwan, Todd Mullis, Caleb Schlacter, John Tomashek, L. Andrew Lee, IMCS, Inc., Irmo, SC, USA

P-T-255 Innovative Gradient Substances: Influence of Co-and Counterions on Separation in Cation Exchange Chromatography. Carolin Stange1, Christoph Korpus2, Romas Skudas2, Christian Frech1, 1University of Applied Sciences Mannheim, Mannheim, GERMANY; 2Merck KGaA, Darmstadt, GERMANY

P-T-256 A Scalable Adenovirus Production Process, from Cell Culture to Purified Bulk. Asa Hagner MoWhirter, Magnus Bergman, Eva Blanck, Sara Hagglad-Sahlberg, Pelle Sjoholm, Maria Soultsioti, Sravani Musunuri, Anna Akerblom, Asa Lagerlof, Mats Lundgren, GE Healthcare, Uppsala, SWEDEN
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