—PREP 2017 Scientific Program—
(program as of 7-8-2017)

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The use of still or video cameras and cell phones is prohibited during the oral program; and prohibited in the poster and exhibition areas without the express consent of the presenter or exhibitor. Opinions expressed by presenters, instructors and exhibitors are not necessarily the opinions of the PREP 2017 Symposium. 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 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.
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PREP Symposium Conference History

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Best 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.

Poster Session Presentation Guidance

POSTER SET UP
- ALL posters must be set up on Monday, between 8:30 AM to 1:00 PM.
- ALL posters stay up on the poster boards for two days (do NOT remove until the end of the day on Tuesday).

POSTER TEAR DOWN
- Only remove posters from the poster boards on Tuesday between 3:30-6:00 PM.

POSTER SESSIONS
- Posters are located in the Millennium Exhibit Hall, 2nd floor.
- Poster board numbers correspond to the poster presentation numbers in the Final Program.
- Authors presenting posters are required to be in attendance at their poster board during the Poster Session on the day/time of their poster presentation.
- Reprint envelopes are attached to the poster boards. To request reprints of poster abstracts, please insert your business card in the envelope.
- Each day, poster presenters should look in their reprint envelopes to retrieve any business cards that may be inside the envelope.
- Leave the poster on the poster board for 2 days; do not remove until Tuesday.

Oral Session Presentation Guidance

ORAL PRESENTERS
Prior to the start of each session, please arrive at your session at least 20 minutes before the start of the session to introduce yourself to the session chair and to submit your presentation on a flash drive labeled with the presenter’s name. Important to note that if there is no time to submit your presentation between sessions, please submit the presentation during the break that immediately precedes your session.

When you are next to present in your session, please come to the podium and get your presentation set up during the question period for the previous talk.

We recommend that you use the computer that is provided unless using your own computer is essential to avoid software/hardware compatibility issues. Computers running Windows XP will be available with PowerPoint, and Acrobat Reader software using standard default settings. Please read Lecture Guidelines posted under the link to Program at PREPsymposium.org.

Kindly note that session chairs are under very strict instructions to keep their sessions on schedule.
# Training Workshops and Tutorials

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

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

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**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
Hall A-1  from Small Organic Biomolecules to Column Free Purification of Monoclonal 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 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 Chromatography Strategies for the Removal of Product-Related Impurities, Sponsored by Bio-Rad Laboratories
Tubman Room  (light lunch will be provided)
3rd floor  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
Hall A-2  Sponsored by Agilent Technologies
2nd floor  (light breakfast will be provided)
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 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 Processes, Sponsored by YPSO-FACTO
Commonwealth  (light lunch will be provided)
Hall A-2  Must pre-register at the booth of YPSO-FACTO by Monday @ 5:10 PM
2nd floor

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

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  (light lunch will be provided)
3rd floor  Must pre-register at the booth of Thermo Fisher Scientific by Monday @ 5:10 PM
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Sunday, July 16, 2017

9:00 AM - 1:00 PM
Sunday Workshop 1: Fundamentals of Preparative Chromatography for Biomolecule Purification by Batch and Continuous Processes
Commonwealth Hall A-1, 2nd floor
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 multicolonm 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
Workshop 2: Fundamentals of Preparative Chromatography for Purification of APIs, Peptides, and Oligonucleotides by Batch Chromatography, SMB, and SFC
Commonwealth Hall A-1, 2nd floor
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

7:30 AM  
**Symposium Registration Open**  
Location: Commonwealth Hall Foyer, 2nd floor

10:10 AM - 7:30 PM  
**Exhibition Open in Millennium Hall, 2nd floor**

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**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

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7:00 AM - 8:25 AM  
**Tutorial on Tips, Tricks, and Troubleshooting Analytical and Overloaded Prep Chromatography**  
Commonwealth Hall A-1, 2nd floor  
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](http://PREPsymposium.org). Open to conference and non-conference participants. Must pre-register to attend.*

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**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

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**1. Monday Keynote Session:**  
**Industrial Case Studies in Protein Chromatography**  
Session Chair: Alan Hunter, MedImmune  
Location: Commonwealth Hall C/D, 2nd floor

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8:30 AM  
(L-101)  
**A Keytruda Story: Lightening Speed from Development to Commercialization, Challenges and Successes.**  
Sunitha Kandula, David Roush, Nihal Tugcu, Merck, Kenilworth, NJ, USA

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8:50 AM  
(L-102)  
**Separation Challenges and Strategies for the Manufacture of Homogenous Antibody-Drug Conjugates.**  
Michaela Wendeler, MedImmune, Gaithersburg, MD, USA

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9:10 AM  
(L-103)  
**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 Ardesna, Gerald Terfloth, Kent Goklen, GlaxoSmithKline R&D, King of Prussia, PA, USA

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9:30 AM  
(L-104)  
**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

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9:50 AM  
(L-105)  
**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, Genetech, South San Francisco, CA, USA

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10:10-10:40 AM  
**Break in Millennium Exhibition Hall**
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** (L-106) **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** (L-107) **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** (L-108) **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** (L-109) **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** (L-110) **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, from Small Organic Biomolecules to Column Free Purification of Monoclonal 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**

Alessandra Basso will present the Chromalite range of products, including IEX analytical HPLC, PuroPhase for SPE, RP and IEX for industrial chromatography. The macroporous family of polydivinylbenzene and methacrylic resins of varying porosity, surface area, and functional groups is suitable for purification of molecules up to 6KDa. Hans J. Johansson will give an update on recent developments of the Praesto range of agarose-based chromatography resins. The presentation will focus on Protein A, pre-activated, and jetted resins with a very narrow particle distribution. Oleg Shinkazh, CEO of Chromatan Corporation will present on the new type of protein A resin that was developed jointly with Purolite to exploit the unique capabilities of Continuous Counter current Tangential Chromatography (CCTC) - a new column-free continuous purification platform for mAbs, vaccines and other biologics.

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

(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 Chromatography Strategies for the Removal of Product-Related Impurities, Sponsored by Bio-Rad Laboratories**

(light lunch will be provided)

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

Join us for an interactive discussion of new developments in purification and chromatography strategies for removal of product-related impurities. As biotherapeutics become more diverse, technologies are evolving to address these new opportunities and maximize overall efficiencies. Attend this workshop to learn about the interactions between chromatography resins and diverse biomolecules, approaches to develop effective purification schemes, and case studies with focus on product-related impurity removal—dimers, aggregates, and charge variants. There will be an opportunity to engage with industry professionals and discuss your current separation challenges. Pre-register at Booth 313 by 10:30 AM on Monday, July 17.

**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
**Monday, July 17, 2017**

### 3A. Monday Parallel Session: Bioprocesses

**Session Chair:** Andre Dumetz, GlaxoSmithKline  
**Location:** Commonwealth Hall C/D, 2nd floor

**3:20 PM**  
(L-111) **pH Calculations in Physico-chemical Modeling of Bioprocess Systems – Concepts, Applications and Opportunities.** Natraj Ram, AbbVie, Worcester, MA, USA

**3:40 PM**  
(L-112) **Effects of Antibody Disulfide Bond Reduction on Purification Process Performance and Final Drug Substance Stability.** Wai Keen Chung, Brian Russell, Yanhong Yang, Michael Handlogten, Suzanne Hudak, Mingyan Cao, Jihong Wang, David Robbins, Sanjeev Ahuja, Min Zhu, MedImmune, Gaithersburg, MD, USA; *Boehringer Ingelheim, Freemont, CA, USA*

**4:00 PM**  
(L-113) **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**  
(L-114) **Linking Single Pass Tangential Flow Filtration with Affinity and Anion Exchange Chromatography for Intensified mAb Processing.** Juan Castano, Thomas Elich, Herb Lutz, Elizabeth Goodrich, Nicolas Laroudie, Mathilde Bourguignat, Alejandro Becerra-Arteaga, EMD Millipore Corporation, Billerica, MA, USA; EMD Millipore Corporation, Molsheim, FRANCE; Millipore S.A.S, Molsheim, FRANCE; Millipore 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**  
(L-115) **Continuous Manufacturing of Agarose Beads for Design of Protein A Chromatography Resins.** Hans J. Johansson, Purolite, Llantrisant, UK

**3:40 PM**  
(L-116) **Polishing of mAb Charge Variants using Preparative Ion Exchange and Multimodal Chromatography.** Anna Gronberg, Bengt Westerlund, Tomas Bjorkman, Lena Karl, Anders Ljunglof, Eggert Brekkkan, GE Healthcare, Uppsala, SWEDEN

**4:00 PM**  
(L-117) **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 Matsumoto, Yasuto Umeda, Malcolm G. Pluskal, Shigeyuki Aoyama, JNC Corporation, Yokohama, JAPAN; JNC America, Littleton, MA, USA

**4:20 PM**  
(L-118) **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**

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PREP 2017 Scientific Program Page 14
### Monday, July 17, 2017

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

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>5:10 PM</td>
<td>(L-119)</td>
<td>Thermodynamic Properties of Staphylococcal Protein A – Antibody Interaction.</td>
<td>Walpurga Krepper¹, Peter Satzer¹, Alois Jungbauer², ¹BOKU Vienna, Vienna, AUSTRIA; ²BOKU Vienna and Austrian Center of Industrial Biotechnology (ACIB), Vienna, AUSTRIA</td>
</tr>
<tr>
<td>5:30 PM</td>
<td>(L-120)</td>
<td>Improving the Selectivity and Robustness of Protein A Chromatography with PEGylated Ligands.</td>
<td>Justin Weinberg¹, Shaojie Zhang², Allison Kirkby¹, Enosh Shachar¹, Giorgio Carta², Todd Przybycien¹, ¹Carnegie Mellon University, Pittsburgh, PA, USA; ²University of Virginia, Charlottesville, VA, USA</td>
</tr>
<tr>
<td>5:50 PM</td>
<td>(L-121)</td>
<td>Protein A Chromatography as Capture Step for Antibody Fragments: Mechanism of Interaction and Case Study.</td>
<td>Alpana Naresh¹, Gerald Platteau², Guido Stroehlein², Vaiva Gasparunaite³, Cecile Vincke³, Yann Sterckx², 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</td>
</tr>
<tr>
<td>6:10 PM</td>
<td>(L-122)</td>
<td>An Expanded use for an Industry Stalwart: Leveraging Affinity Purification to Select Product Critical Quality Attributes.</td>
<td>Warren Kett, Avitide Inc., Lebanon, NH, USA</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>5:10 PM</td>
<td>(L-123)</td>
<td>Chromatographic Materials for Enhancing the Productivity and Resolution of High Performance Liquid Chromatography Separations using Modern Chromatographic Particles.</td>
<td>Ernest Sobkow, YMC, Allentown, PA, USA</td>
</tr>
<tr>
<td>5:30 PM</td>
<td>(L-124)</td>
<td>Process Scale Purification of Synthetic Peptides by HPLC.</td>
<td>Marc Jacob¹, Tivadar Farkas¹, Guido Krautz², ¹Phenomenex, Torrance, CA, USA; ²Phenomenex, Aschaffenburg, GERMANY</td>
</tr>
<tr>
<td>5:50 PM</td>
<td>(L-125)</td>
<td>Enhanced Peptide and Oligonucleotide Purification via Novel Orthogonal, Doped Reverse Phase Chromatography.</td>
<td>Timothy O’Mara¹, Joachim Kinkel², Juergen Machielse³, Andrea Wild³, Itochu Chemicals America Inc., White Plains, NY, USA; ²TU Nuerenberg, Nuerenberg, GERMANY; ³Zeochem AG, Uetikon am See, SWITZERLAND</td>
</tr>
<tr>
<td>6:10 PM</td>
<td>(L-126)</td>
<td>RP-HPLC Analysis of Amphiphilic Oxime Linker Synthesis and DM1-oxime Conjugation for ADC.</td>
<td>Hyunmin Ryu, Pil Seok Chae, E. K. Lee, Hanyang University, Ansan, SOUTH KOREA</td>
</tr>
</tbody>
</table>

6:30-7:30 PM | Reception in Millennium Exhibition Hall, 2nd floor |

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PREP 2017 Scientific Program Page 15
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**

<table>
<thead>
<tr>
<th>Tuesday Tutorial</th>
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</thead>
<tbody>
<tr>
<td><strong>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.</strong></td>
</tr>
<tr>
<td>Location: Commonwealth Hall A-1, 2nd floor</td>
</tr>
</tbody>
</table>

#### 7:00-8:25 AM  
**Tutorial on Practical Concepts on Process Characterization and Validation of Biopharmaceuticals based on QbD Principles**  
**Commonwealth 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.**

#### 7:00-8:25 AM  
**Workshop on Introducing Innovative Technologies for PREP Work Flows, Sponsored by Agilent Technologies**  
**Commonwealth Hall A-2, 2nd floor**  
*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

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

### 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

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentation</th>
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</thead>
<tbody>
<tr>
<td>10:40 AM</td>
<td><strong>Perspective on Continuous Manufacturing for Pharmaceuticals.</strong> Lois Ann Beaver, LAB Enterprise, Chevy Chase, MD, USA</td>
</tr>
<tr>
<td>11:00 AM</td>
<td><strong>Dynamic Process Control of Twin-column Periodic Counter-current Chromatography Processes.</strong> Lars Aumann¹,², Thomas Muller-Spath¹,², Daniel Baur¹, Michael Bavand², Massimo Morbidelli³, ETH Zurich, Zurich, SWITZERLAND; ²ChromaCon, Zurich, SWITZERLAND</td>
</tr>
<tr>
<td>11:40 AM</td>
<td><strong>Rapid in Silico Design of Integrated Downstream Bioprocesses for Efficient Removal of Impurities.</strong> Nicholas Vecchiarello, Chaz Goodwine, Steven Timmick, Steven Cramer, Rensselaer Polytechnic Institute, Troy, NY, USA</td>
</tr>
<tr>
<td>12:00 PM</td>
<td><strong>Cost Modeling of an Integrated, Continuous Downstream mAb Platform.</strong> Jonathan Hummel, Mark Schofield, Pall Life Sciences, Westborough, MA, USA</td>
</tr>
</tbody>
</table>
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 Processes with Improved Downstream Tools, Sponsored by GE Healthcare Life Sciences**
Commonwealth Hall A-1 (2nd floor)
Must pre-register at the booth of GE Healthcare Life Sciences by Monday @ 5:10 PM
(light lunch will be provided)
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 Processes, Sponsored by YPSO-FACTO**
Commonwealth Hall A-2 (2nd floor)
Must pre-register at the booth of YPSO-FACTO by Monday @ 5:10 PM
(light lunch will be provided)
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 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. Key benefits of using Kromasil is its mechanical and chemical stability as well as its availability in a wide range of particle sizes, so methods can be developed in the early stages of discovery with our slurry prepacked columns and scaled up for development and manufacturing with our bulk, saving critical resources and time to market. During this workshop we will present new developments in stationary phases of key interest for chromatographers as well as application examples.
**Tuesday, July 18, 2017**

**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*

(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 Exhibit 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
(L-211) **Moment Analysis Technique for Scaling-up Protein Chromatography.**
Wojciech Marek¹, Astrid Duerauer², Alois Jungbauer³, Wojciech Piatkowski¹, Dorota Antos¹, ¹Rzeszow University of Technology, Rzeszow, POLAND; ²University of Natural Resources and Life Sciences, Vienna, AUSTRIA

3:40 PM
(L-212) **Restricted Diffusion of Proteins in Multicomponent Mixtures.**
Alexander Matlschweiger¹, Preston Fuks², Giorgio Carta², Rainer Hahn¹, ¹BOKU Vienna, Vienna, AUSTRIA; ²University of Virginia, Charlottesville, VA, USA

4:00 PM
(L-213) **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 Schulte³, Christian Frech¹, ¹University of Applied Sciences, Mannheim, GERMANY; ²Merck KGaA, Darmstadt, GERMANY

4:20 PM
(L-214) **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 Mihlbachler¹, 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

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>3:20 PM</td>
<td><strong>Fundamental Investigations of Peak Distortions in Preparative SFC</strong></td>
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<td><strong>Separation of Basic Components Accounting for Both Additive and Co-Solvent.</strong></td>
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<td>Emelie Glenne(^1), Jorgen Samuelsson(^1), Hanna Leek(^2), Magnus Klarqvist(^2), Torgy Fornstedt(^1), (^1)Karlstad University, Karlstad, SWEDEN; (^2)AstraZeneca R&amp;D, Molndal, SWEDEN</td>
</tr>
<tr>
<td>3:40 PM</td>
<td><strong>Preparative Supercritical Fluid Chromatography in Support of Drug</strong></td>
</tr>
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<td><strong>Discovery and Development at Merck.</strong> Mirlinda Biba, Jinchu Liu, Judy Morris, Jimmy DaSilva, Merck, Rahway, NJ, USA</td>
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<tr>
<td>4:00 PM</td>
<td><strong>Sample Introduction in Preparative SFC.</strong> Geoffrey Cox, PIC Solution Inc., Media, PA, USA</td>
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<tr>
<td>4:20 PM</td>
<td><strong>The Development of a Chemical Test Mixture to Track Column Performance</strong></td>
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<td></td>
<td><strong>and Stationary Phase Suitability for Optimized Preparative SFC Chromatography.</strong> Matthew Przybyciel, ES Industries, West Berlin, NJ, USA</td>
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<tr>
<td>4:40-4:50 PM</td>
<td><strong>Intermission</strong></td>
</tr>
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### 8A. Tuesday Parallel Session: Column and Molecule-Surface Interaction Characterization

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

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>4:50 PM</td>
<td><strong>In situ Visualization of the Packing Structure by X-ray Nanotomography</strong></td>
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<td><strong>and Modeling of Chromatographic Efficiency by Computational Fluid Dynamics.</strong></td>
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<tr>
<td></td>
<td>Susanne Schweiger(^1), Rupert Tscheliessnig(^2), Tim Schroeder(^2), Alois Jungbauer(^3), (^1)Austrian Centre of Industrial Biotechnology, Vienna, AUSTRIA; (^2)Repligen, Weingarten, GERMANY; (^3)BOKU Austrian Centre of Industrial Biotechnology, Vienna, AUSTRIA</td>
</tr>
<tr>
<td>5:10 PM</td>
<td><strong>Effects of Resin Architecture and Protein Size on Protein Distribution in</strong></td>
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<td></td>
<td><strong>Ion-exchange Media.</strong> Stijn Koshari, Norman Wagner, Abraham Lenhoff, University of Delaware, Newark, DE, USA</td>
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<tr>
<td>5:30 PM</td>
<td><strong>Thermodynamic Analysis of the Adsorption of Proteins onto Ion Exchange</strong></td>
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<td></td>
<td><strong>Chromatography Resins: Basic Proteins – Cation Exchange Chromatography Gels.</strong></td>
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<td>Joao Cardoso, Noriko Yoshimoto, Shuichi Yamamoto, Yamaguchi University, Ube, JAPAN</td>
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<tr>
<td>5:50 PM</td>
<td><strong>Overloading Studies of Zwitterionic Chromatographic Columns.</strong></td>
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<td>Attila Felinger, University of Pecs, Pecs, HUNGARY</td>
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<td>6:10 PM</td>
<td><strong>Pause</strong></td>
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</tbody>
</table>
**Tuesday, July 18, 2017**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:50 PM</td>
<td>(L-223)</td>
<td>Overcoming the Limitations for the Production of Pure Biomolecules using Simulated Moving Bed Chromatography.</td>
<td>Anil Oroskar, Babu Antharavally, Pravin Ninawe, Rahuljit Pla, Asha Oroskar, Orochem Technologies, Naperville, IL, USA</td>
</tr>
<tr>
<td>5:10 PM</td>
<td>(L-224)</td>
<td>Model-based Design of Ternary Separations with Centrifugal Partition Chromatography.</td>
<td>Raena Morley, Johannes Goll, Mirjana Minceva, Technical University of Munich, Freising, GERMANY</td>
</tr>
<tr>
<td>5:30 PM</td>
<td>(L-225)</td>
<td>New Prep Countercurrent Chromatograph with the Spiral Tubing Support and Mixer-Settler Rotors.</td>
<td>Martha Knight¹, Thomas Finn¹, Rodrigo Lazo-Portugal¹, Ben Feldman², Eric Cabahug², ¹CC Biotech LLC, Rockville, MD, USA; ²Prototype Productions Inc., Ashburn, VA, USA</td>
</tr>
<tr>
<td>5:50 PM</td>
<td>(L-226)</td>
<td>Improvement Opportunities for the Purification of Taxane Compounds.</td>
<td>Dora Rutterschmid, Zsolt Kovacs, Zsolt Misek, Ying Hou Guan, Laszlo Nemeth, Laszlo Lorantfy, RotaChrom, Dabas, HUNGARY</td>
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<td>6:10 PM</td>
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**Wednesday, July 19, 2017**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>7:30 AM</td>
<td></td>
<td>Symposium Registration Open</td>
<td></td>
</tr>
<tr>
<td>8:30 AM</td>
<td>(L-301)</td>
<td>8-Zone Simulated Moving Bed Chromatography: Setup Techniques.</td>
<td>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</td>
</tr>
<tr>
<td>8:50 AM</td>
<td>(L-302)</td>
<td>Model-based Design and Operation of Simulated Moving Bed Reactor for the Production of Glycol Ether Acetate: Esterification vs. Transesterification.</td>
<td>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</td>
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<tr>
<td>9:10 AM</td>
<td>(L-303)</td>
<td>Recovery of Sugars from Lignocellulosic Hydrolysates by Continuous Ion Exclusion Chromatography.</td>
<td>Gabriele Lodi¹, Giuseppe Storti², Laura Annamaria Pellegrini¹, Massimo Morbidelli¹, Politecnico di Milano, Milano, ITALY; ²ETH Zurich, Zurich, SWITZERLAND</td>
</tr>
</tbody>
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### Wednesday, July 19, 2017

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

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

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<tr>
<td>9:30 AM</td>
<td>(L-304) <strong>On the use of Single-column Chromatography with Recycle Lag to Reproduce the Behavior of Three- and Four-column Simulated Countercurrent Chromatography.</strong> Abimaelle Chiberio, Jose Paulo Mota, LAQV@REQUIMTE, Universidade NOVA de Lisboa, Monte de Caparica, PORTUGAL</td>
</tr>
<tr>
<td>9:50 AM</td>
<td>(L-305) <strong>Recycling Chromatography Process to Unlock Challenging Separation Problems.</strong> Fabrice Gritti, Mike Leal, Martin Gilar, Waters Corporation, Milford, MA, USA</td>
</tr>
<tr>
<td>10:10-10:20 AM</td>
<td><strong>Presentation of Awards to Winners of the Best Poster Competition</strong></td>
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<tr>
<td>10:20-10:40 AM</td>
<td><strong>Break</strong></td>
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#### 10. Wednesday Session: Monoliths and Alternatives to Packed Beds

**Session Chair:** Milton Hearn, Monash University  
**Location:** Millennium Hall, 2nd floor

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<th>Time</th>
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<tbody>
<tr>
<td>10:40 AM</td>
<td>(L-306) <strong>Monolithic Chromatography as an Alternative for the Separation of High-value Biomolecules.</strong> Mirna Gonzalez-Gonzalez, Jose Gonzalez-Valdez, Karla Mayolo-Deloisa, Marco Rito-Palomares. Tecnologico de Monterrey, Monterrey, MEXICO</td>
</tr>
<tr>
<td>11:00 AM</td>
<td>(L-307) <strong>Efficient High Throughput Separations of IgG using a Protein A Immobilized Spongy Monolith in Liquid Chromatography.</strong> Takuya Kubo¹, Kei Kubota², Naoki Nishimura¹, Tetsuya Tanigawa³, Toyohiro Naito¹, Koji Otsuka¹, ¹Kyoto University, Kyoto, JAPAN; ²Daichi Sankyo Co. Ltd., Hiratsuka, JAPAN; ³Chemco Scientific Co. Ltd., Osaka, JAPAN</td>
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<tr>
<td>11:20 AM</td>
<td>(L-308) <strong>Triply Periodic Minimal Surface Structures in 3D-printed Chromatography Columns.</strong> Conan Fee¹, Anne Gordon¹, Tim Huber¹, Simone Dimartino², ¹University of Canterbury, Christchurch, NEW ZEALAND; ²University of Edinburgh, Edinburgh, UK</td>
</tr>
<tr>
<td>11:40 AM</td>
<td>(L-309) <strong>mAb Purification Processes Innovation using Novel Chromatographic Materials and Ligands.</strong> Alexei Voloshin, Jonathan Hester, 3M Company, St. Paul, MN, USA</td>
</tr>
<tr>
<td>12:00 PM</td>
<td>(L-310) <strong>Protein A-modified Capillary-channeled Polymer Fibers for Antibody Isolation: From the Analytical PAT Quantification to the Preparative Scale.</strong> R. Kenneth Marcus, Hung Trang, Clemson University, Clemson, SC, USA</td>
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<td>12:20-2:00 PM</td>
<td><strong>Break</strong></td>
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<td>2:00 PM</td>
<td>(L-311) <strong>Defining the Mechanistic Binding of Viral Particles to a Multi-modal Anion Exchange Resin.</strong> Matthew Brown¹, Mike Burnham², Scott Lute¹, Fushan Wang², Sarah Johnson¹, Alison Walsh², Joseph Hughes², Kurt Brorson¹, David Roush³</td>
</tr>
<tr>
<td>2:20 PM</td>
<td>(L-312) <strong>Polymer Grafted Chromatography Media in the Purification of HIV-1 gag Virus-like Particles.</strong> Patricia Pereira Aguilar¹, Tobias Amadeus Schneider², Alois Jungbauer¹</td>
</tr>
<tr>
<td>2:40 PM</td>
<td>(L-313) <strong>Progress in Downstream Process of New Biopharmaceuticals using Non-traditional Chromatographic Strategies.</strong> Cristina Peixoto¹, Ricardo Silva¹, Sofia Carvalho², Sara Rosa¹, Mafalda Moleirinho¹, Paula M. Alves², Manuel J.T. Carrondo³</td>
</tr>
<tr>
<td>3:00 PM</td>
<td>(L-314) <strong>Modular Membrane Chromatography in a Cassette System for Large Scale Virus Capture Chromatography.</strong> Stefan Fischer-Frueholz, Martin Leuthold, Stefan Weisshaar, Miyako Hirai, Florian Taft, Sartorius Stedim Biotech GmbH, Goettingen, GERMANY</td>
</tr>
<tr>
<td>3:20 PM</td>
<td>(L-315) <strong>Synthetic Protein Nanoparticles as Tools Informing the Chromatography of Virus Particle Products.</strong> Stephan Joseph¹, Owen Thomas¹, Daniel Bracewell²</td>
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**Break**
Wednesday, July 19, 2017

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<td>4:10 PM</td>
<td><strong>A Simplified Approach to Design Chromatographic Processes for the Capture of Antibodies.</strong> David Pfister¹, Laurent David¹, Margit Holzer¹, Jay Jun², Roger-Marc Nicoud¹, ¹Ypso-Facto, Nancy, FRANCE; ²Ypso-Facto, Cambridge, MA, USA</td>
</tr>
<tr>
<td>4:30 PM</td>
<td><strong>A Design Calculation Method for Flow-through Chromatography Processes.</strong> Sumiko Hasegawa, Noriko Yoshimoto, Shuichi Yamamoto, Yamaguchi University, Ube, JAPAN</td>
</tr>
<tr>
<td>4:50 PM</td>
<td><strong>Determination of SMA Parameters for Ribulose-1,5-bisphosphate carboxylase/oxygenase from Nicotiana Tabacum in an Oligomeric State of More than 300 kDa.</strong> Catherine Rose Muschen¹, Johannes Felix Buyel², ¹Fraunhofer IME, Aachen, GERMANY; ²RWTH Aachen University/Fraunhofer IME, Aachen, GERMANY</td>
</tr>
<tr>
<td>5:10 PM</td>
<td><strong>When DoE Fails: Mechanistic Modeling for Chromatographic Manufacturability.</strong> Thiemo Huuk¹, Tobias Hahn¹, Teresa Beck¹, Juergen Hubbuch², ¹GoSilico GmbH, Karlsruhe, GERMANY; ²Karlsruhe Institute of Technology (KIT), Karlsruhe, GERMANY</td>
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<tr>
<td>5:30 PM</td>
<td><strong>Chromatography at High Viscosity.</strong> Anton Schultz-Jena¹,², Floor Boon¹, Paul Bussmann¹, Anja Janssen², Albert van der Padt²,³, TNO, Zeist, NETHERLANDS; ²Wageningen University, Wageningen, NETHERLANDS; ³FrieslandCampina, Amersfoort, NETHERLANDS</td>
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<td>5:50-6:00 PM</td>
<td><strong>CLOSING REMARKS.</strong> Giorgio Carta, University of Virginia, Charlottesville, VA, USA</td>
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<td>6:15-7:45 PM</td>
<td><strong>FAREWELL RECEPTION</strong> &lt;br&gt;PREP &amp; ISPPP shared reception in ISPPP Exhibit/Poster Hall &lt;br&gt;Location: Commonwealth Hall B/C, 2nd floor</td>
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<tr>
<td>P-M-101</td>
<td>Simulation and Experimental Study of Continuous Chromatographic Purification of Prebiotics Galacto-Oligosaccharides.</td>
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<td>P-M-102</td>
<td>Investigations into the Effects of Mixed Mode Resin Ligand Chemistry on Recovery and Aggregate Removal of Homologous Tetravalent Bispecific Antibodies.</td>
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<td>P-M-103</td>
<td>Fundamental Studies of the Effect of pH and Temperature on the Adsorbent Surface Interaction for the Anion-exchange Chromatographic Separation.</td>
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<td>P-M-104</td>
<td>Separation of PEGylated Ribonuclease A using PEGylated Monoliths.</td>
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<td>P-M-105</td>
<td>Development of Mathematical Model to Identify the Fouling Mechanism in Depth Filters.</td>
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<td>P-M-107</td>
<td>Preparative Protein Separation Base on Hydrophobic Interaction Chromatography using Polyethylene Terephthalate Capillary-Channeled Polymer (C-CP) Phases.</td>
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<td>P-M-108</td>
<td>Evaluation of Viral Clearance Studies for Monoclonal Antibody Chromatographic Process Steps.</td>
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<td>P-M-110</td>
<td>Enhancement of Your Pharmaceutical Development and/or Manufacturing Process through Integration of Deployable Mass Detection.</td>
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<td>P-M-111</td>
<td>Effect of Additives in Elution Buffers on Protein Separation with Ion-exchange Media.</td>
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<td>P-M-113</td>
<td>Versatility of the Continuous Chromatography Platform.</td>
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<td>P-M-114</td>
<td>Improving Downstream Processing of Influenza Virus-like Particles using Multicolumn Chromatography</td>
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<td>P-M-117</td>
<td>Microwav-assisted Grafting Polymerization of Capillary-channeled Polymer (C-CP) Nylon Fibers for Immobilized Metal-ion Affinity Chromatography (IMAC) Protein Separations</td>
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<td>P-M-118</td>
<td>Little Science – Big Difference in Peptide Purification Processes</td>
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<td>P-M-119</td>
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<td>P-M-120</td>
<td>Protein Capture on 3D-printed Solid Tolerant Chromatography Columns for a Range of Chromatographic Functions</td>
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<td>P-M-121</td>
<td>Column Qualification Runs: Influence of 3D Packing Structure, Peak Analysis Method, and Measurement Accuracy</td>
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<td>P-M-122</td>
<td>When DoE Fails: Mechanistic Modeling for Chromatographic Manufacturability</td>
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<td>P-M-123</td>
<td>Fabrication of Macro-porous Materials for Purification of Therapeutic Proteins by Reactive Gelation under Shear</td>
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<td>P-M-124</td>
<td>Chromatography at High Viscosity</td>
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<td>P-M-125</td>
<td>Protein Adsorption in Anion Exchange Resins – Effects of Polymer Grafting, Backbone Structure, and Protein Size</td>
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Poster Session 1 - Monday @ 2:00 - 3:15 PM

**Poster Board size 42 inches high by 42 inches wide (107cm x 107cm)**
See link to poster guidelines under Author Instructions at PREPsymposium.org

**P-M-126** Separation of Pyrethrin Esters by Centrifugal Partition Chromatography. Alan Wong, Vitold Glinski, Jan Glinski, Planta Analytica LLC, New Milford, CT, USA

**P-M-127** Combination of HIC and Crystallization for Purification of Ovalbumin as a Model Protein. Michał Koldziej, Izabela Poplew ska, Wojciech Piątkowski, Dorota Antos, Rzeszow University of Technology, Rzeszow, POLAND

**P-M-128** Fast Glycan Labeling and Analysis: High-resolution Separation and Identification in Minutes. Mervin Gutierrez¹, Marton Szigeti², Anna Lou¹, Gabor Jarvas², Mark Lies¹, Andras Gutman², Cindy Liang³. ¹SCIEX, Brea, CA, USA; ²Horvath Csaba Laboratory, Debrecen, HUNGARY; ³SCIEX, Framingham, MA, USA

**P-M-129** Interconversion and Chromatographic Separation of Carbohydrate Stereoisomers on PS-DVB Resins. Franziska Ortner, Helena Wiemeyer, Marco Mazzotti, ETH Zurich, Zurich, SWITZERLAND

**P-M-130** Accelerating Antibody Drug Development - A Complete Set of Sub-domain Specific Affinity Ligands that Covers a Broad Variety of Antibody Discovery Platforms. Pim Hermans¹, Bruce Dawson², ¹Thermo Fisher Scientific, Leiden, NETHERLANDS; ²Thermo Fisher Scientific, Frederick, MD, USA

**P-M-131** PLC 2050 and Verity® 1900 MS Detector: Mass-directed Separation of Paracetamol and Vitamin C. Naza Lahoutifard¹, Celine Le Quemener¹, Lenaick Delourme¹, Aurore Bichon¹, Caroline Delmotte², Julie Le Roux¹, Lauren Pahnke³, ¹Gilson Purification, Saint Ave, FRANCE; ²Gilson SAS, Villier le Bel, FRANCE; ³Gilson Inc., Middleton, WI, USA

**P-M-132** Tentacle Cation Exchangers for Optimized Mab Purification: Understanding the Relationship between Tentacle Chemistries and Resin Performance. Lars Henrik Peeck, Andreas Stein, André Kiesewetter, Anja Heinen-Kreuzig, Merck KGaA, Darmstadt, GERMANY

**P-M-133** Bringing down the Cost of Protein A Resins. Hans Johansson, Maria Parau, Caroline Tinsley, Patrick Gilbert, Purolite Life Sciences, Llantrisant, UK

**P-M-134** Compressing a Resin: Stress/Strain, Permeability, and Wall Effect. Marc Ebing er, Eli Lilly & Co., Indianapolis, IN, USA

**P-M-135** Model-based Design of Ternary Separations with Centrifugal Partition Chromatography. Raena Morley, Johannes Goll, Mirjana Minceva, Technical University of Munich, Freising, GERMANY

**P-M-136** Separation of Natural Compounds using Deep Eutectic Solvent-based Biphasic Systems in Centrifugal Partition Chromatography. Franziska Bezold, Simon Röhrrer, Raena Morley, Mirjana Minceva, Technical University of Munich, Freising, GERMANY

**P-M-137** Chemical Profiling of Natural Metabolite Mixtures: The Potential of Centrifugal Partition Chromatography Combined to 13C NMR and Chemometric Tools. Jane Hubert, Jean-Marc Nuzillard, Jean-Hugues Renault, University of Reims, Reims, FRANCE
P-M-138 Isolation of Product-related Impurities from Active Pharmaceutical Ingredients using an Automated Chromatographic Enrichment Process (N-Rich), Lars Aumann1, Thomas Muller-Späth1, Michael Bavand2, Massimo Morbidelli1, 1ETH Zurich, Zurich, SWITZERLAND; 2ChromaCon, Zurich, SWITZERLAND

P-M-139 Hydrophobic Interaction Chromatographic Media for mAb & ADC Separation with High Resolution. Ke Yang1, Sixi Wang1, Haiying Chen1, Xueying Huang1, Ding Zhong2, 1Sepax Technologies Inc., Newark, DE, USA; 2Sepax Technologies Inc., Suzhou, CHINA

P-M-140 Effective Wash Solutions to Improve Removal of E.coli HCP in Protein L Chromatography of scFv. Judith Vajda, Sascha Janz, Egbert Müller, Tosoh Bioscience, Griesheim, GERMANY

P-M-141 Novel Hybrid Reversed-phase Packing Material for High Productivity of Insulin Purification. Hiroki Kanezaki1, Chiaki Iwata1, Moemi Miyashita1, Hiroyuki Tanaka1, Takashi Sato1, Noriko Shoji1, Naohiro Kuriyama2, 1YMC Co. Ltd., Komatsu, JAPAN; 2YMC Co. Ltd., Kyoto, JAPAN


P-M-143 Development of Novel Through-porous Particles as a Separation Media for Chromatography. Ken Tsutsui1, Hiroki Kanezaki1, Ryosuke Takahashi2, Ryota Wada2, Masatoshi Taniguchi2, Moemi Miyashita1, Noriko Shoji1, Naohiro Kuriyama2, Norio Ishizuka3, 1YMC Co. Ltd., Komatsu, JAPAN; 2YMC Co. Ltd., Kyoto, JAPAN; 3Emaus Kyoto Inc., Kyoto, JAPAN

P-M-144 Subcritical Peptide Purification – A Pilot Study. Annika Langborg Weinmann, Alexandra Gafiteşcu, Magnus Klarqvist, Eliska Krupnova, Tomas Leek, AstraZeneca R&D, Molndal, SWEDEN

P-M-145 A Design Calculation Method for Flow-through Chromatography Processes. Sumiko Hasegawa, Noriko Yoshimoto, Shuichi Yamamoto, Yamaguchi University, Ube, JAPAN

P-M-146 Recovery of Sugars from Lignocellulosic Hydrolysates by Continuous Ion Exclusion Chromatography. Gabriele Lodi1, Laura Annamaria Pellegrini1, Massimo Morbidelli2, Giuseppe Storti2, Politecnico di Milano, Milano, ITALY; 2ETH Zurich, Zurich, SWITZERLAND
P-T-201  **Customizing a Stationary Phase for Extreme usage Conditions.** Hidehiro Itou¹, Imre Sallay², ¹Osaka Soda, Amagasaki, JAPAN; ²Osaka Soda, Osaka, JAPAN

P-T-202  **Noninvasive Investigation on the State of the Column during CIP.** Imre Sallay, Osaka Soda Co. Ltd., Osaka, JAPAN

P-T-203  **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

P-T-204  **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

P-T-205  **Enhanced Peptide and Oligonucleotide Purification via Novel Orthogonal, Doped Reverse Phase Chromatography.** Jurgen Machielse¹, Joachim Kinkel², Andrea Wild³, Timothy O'Mara³, ¹Zeochem AG, Uetikon am See, SWITZERLAND; ²TU Nuerenberg, Nuerenberg, GERMANY; ³Itochu Chemicals America Inc., White Plains, NY, USA

P-T-206  **Strongly Coupled Network Simulation with CADET.** William Heymann, Samuel Leweke, Eric von Lieres, Forschungszentrum Juelich, Juelich, GERMANY

P-T-207  **High-speed Gas and Headspace Analysis for the Process-line and Laboratory: SIFT-MS.** Casey Anderson¹, Daniel Milligan², Barry Prince³, Mark Perkins², Terry Wilks¹, Chuck Renner¹, ¹Quantum Analytics, Foster City, CA, USA; ²Syft Technologies, Christchurch, NEW ZEALAND; ³Anatune Limited, Cambridge, UK

P-T-208  **Rapid Screening of Packaging for Residual Monomers using SIFT-MS.** Casey Anderson¹, Daniel Milligan², Vaughan Langford³, Barry Prince², Mark Perkins³, Terry Wilks¹, Chuck Renner¹, ¹Quantum Analytics, Foster City, CA, USA; ²Syft, Christchurch, NEW ZEALAND; ³Anatune Limited, Cambridge, UK

P-T-209  **Efficient, Baseline Separation of Pyrethrins by Centrifugal Partition Chromatography.** Vitold Glinski, Planta Analytica, New Milford, CT, USA

P-T-210  **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 Schweißer², Tim Schroeder³, ¹BOKU, Vienna, AUSTRIA; ²ACIB, Vienna, AUSTRIA; ³Repligen, Weingarten, GERMANY

P-T-211  **The Effect of pH and Temperature on Protein Separation in Anion-exchange Chromatography.** Gorgi Pavlov, James T. Hsu, Lehigh University, Bethlehem, PA, USA

P-T-212  **Synthetic Chromatographic Resins for Purification of Proteins, Peptides and Small Molecules from a Complex Matrix.** Benjamin Summers, Alessandra Basso, Simona Serban, Purolite, Llantrisant, UK

P-T-213  **Extra Column Effects in Linear Gradient Elution.** Rainer Hahn, BOKU Vienna, Vienna, AUSTRIA

P-T-214  **Automated LC/MS Purification of Compound Libraries.** Florian Rieck, Ronald Guilliet, Stefan Ullrich, Agilent Technologies, Waldbronn, GERMANY
P-T-215  
**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-Kelly¹, John Welsh², Alison Rodger¹, Tim Dafforn¹, Owen Thomas¹, ¹University of Birmingham, Birmingham, UK; ²Pall Corporation, Portsmouth, UK; ³University of Warwick, Warwick, UK

P-T-216  
**Evaluation of a Highly Effective Sporicidal Sanitization Solution for Protein A Affinity Resins.** Alexis Henry¹, Elin Monie², Anna Groenberg², Matthew Wheeler², Bill Carpenter¹, Greg Runyon¹, Edward Koepf¹, ¹Biogen, RTP, NC, USA; ²GE Life Sciences, Uppsala, SWEDEN; ³Kymanox, Durham, NC, USA

P-T-217  
**Impact of Product and Recycle Times in MCSGP Polishing on Process Performance Parameters.** Sebastian Vogg, Nicole Ulmer, Massimo Morbidelli, ETH Zurich, Zurich, SWITZERLAND

P-T-218  
**Multi Column Chromatography: Number of Columns Required for Optimizing Protein A Capacity and Productivity.** Xhorxi Gjoka, Mark Pagkalwangan, Jonathan Hummel, Aditya Utturkar, Mark Schofield, Pall Corporation, Westborough, MA, USA

P-T-219  
**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

P-T-220  
**Description of Thermodynamic Equilibria between Adsorbed and Convective Phases under Nonideal Conditions.** Franziska Ortner, Chantal Ruppli, Mazzotti Marco, ETH Zurich, Zurich, SWITZERLAND

P-T-221  
**Use of Flocculants in Mammalian Cell Culture Processes for Enhanced Clarification Performance and Impurity Removal.** Michael Peck¹, Ushma Mehta², Trish Greenberg², Nripen Singh¹, Zheng Jian Li¹, ¹Bristol-Myers Squibb, Devens, MA, USA; ²MilliporeSigma, Bedford, MA, USA

P-T-222  
**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 Hunt⁴, Robert Todd⁴, Christian Kunert³, Will Johnson³, Eric von Lieres¹, ¹Forschungszentrum Julich, Julich, GERMANY; ²KBI Biopharma, Boulder, CO, USA; ³Amgen, Cambridge, MA, USA

P-T-223  
**Calibration of Mechanistic Chromatography Models using Artificial Intelligence.** Gang Wang¹, Till Briskot¹, Tobias Hahn¹, Pascal Baumann¹, Jürgen Hubbuch¹, ¹Karlsruhe Institute of Technology, Karlsruhe, GERMANY; ²GoSilico GmbH, Karlsruhe, GERMANY

P-T-224  
**Peptide Purification Utilizing Automated Gradient Optimization and Delay Volume Calibration for Scale up from Analytical HPLC to Preparative Purification System with Open Bed Fraction Collector.** Lori Sandford, Lance Kasper, Kyle Busch, Agilent Technologies inc., Wood Dale, IL, USA

P-T-225  
**From Batch to Continuous Multi-column Chromatography at the Production Scale.** Kathleen Mihlbachler¹, Lars Aumann², Thomas Muller-Spalth², ¹LEWA Nikkiso America, Devens, MA, USA; ²ChromaCon, Zurich, SWITZERLAND
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| P-T-226 | Development of a Hilic-based Method to Identify and Characterize Glycosylation Profiles in Proteins. Jessica Waller, Ji Zheng, Xiao-Ping Dai, Celgene Corporation, Summit, NJ, USA |
|---------------------------------------------|
| P-T-227 | In silico Robustness Analysis of Chromatographic Processes using Latin Hypercube Sampling. Christopher Gerberich, Andre Dumetz, Gerald Terfloth, GlaxoSmithKline, King of Prussia, PA, USA |
|---------------------------------------------|
| P-T-228 | Achiral SFC: No C18 Equivalent, No Problem. J. Preston, Marc Jacob, Phenomenex, Torrance, CA, USA |
|---------------------------------------------|
| P-T-229 | Continuous Desalting of Protein Solution with Microporous Chromatographic Resins. Nicole Walch1, Alois Jungbauer2, 1Austrian Centre of Industrial Biotechnolog, Vienna, AUSTRIA; 2BOKU Vienna, Vienna, AUSTRIA |
|---------------------------------------------|
| P-T-230 | Adsorption Behavior of Proteins, RNA, and VLPs on Ceramic Hydroxyapatite. Yiran Wang, Giorgio Carta, University of Virginia, Charlottesville, VA, USA |
|---------------------------------------------|
| P-T-231 | Investigating Effects of Cell Culture Flocculation on Protein A Chromatography. Yoshiharu Asaoka, Michael Peck, Abby Schadock-Hewitt, Nripen Singh, Srinivas Chollangi, Bristol-Myers Squibb, Devens, MA, USA |
|---------------------------------------------|
| P-T-232 | 8-Zone Simulated Moving Bed Chromatography: Setup Techniques. Francisco Vitos Santos da Silva1, Andreas Seidel-Morgenstern1, 1Max Planck Institute Magdeburg, Magdeburg, GERMANY, 2Otton von Guericke University, Magdeburg, GERMANY |
|---------------------------------------------|
| P-T-233 | Development of a Chromatography-based Hydrophobicity Assay for Viral Particles. Alison Walsh1, Sarah Johnson2, Mike Burnham3, Matthew Brown4, Scott Lute5, David Roush6, Kurt Brorson7, 1WuXi AppTec, Philadelphia, PA, USA; 2U.S. Food and Drug Administration, Silver Spring, MD, USA; 3WuXi AppTec, Philadelphia, PA, USA; 4Merck Research Labs, Kenilworth, NJ, USA |
|---------------------------------------------|
| P-T-234 | Direct Analysis of Glycoforms of mAb in Cell Culture Supernatant with Affinity Resin Coupling Fc Receptor III. Yosuke Terao, Naoki Yamanaka, Satoshi Endo, Yukie Yamamoto, Yoshiharu Asaoka, Seigo Oe, Teruhiko Ide, TOSOH Corporation, Ayase, JAPAN |
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| P-T-235 | Development of New silica Support for Perfusion Chromatography. Hiroshi Kobayashi, Hiroo Wada, Shinwa Chemical Industries Ltd., Kyoto, JAPAN |
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| P-T-236 | New Affinity Resins for Fab Fragment Antibodies Purification. Yusaku Mizuguchi1, Tetsuo Fukuta1, Makoto Higami1, Masaki Hamamura1, Yoko Akazawa-Ogawa1, Yoshihisa Hagihara1, Norihiko Kiyose3, Nobuo Miyazaki3, Yuji Ito3, Tomonari Matsuda7, Motoyasu Adachi9, 1JSR Life Sciences Corporation, Tsukuba, JAPAN; 2JSR Corporation, Tokyo, JAPAN; 3National Institute of Advanced Industrial Science and Technology (AIST), Ikeda, JAPAN; 4National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, JAPAN; 5ARK Resource Co. Ltd., Misato, JAPAN; 6Kagoshima University, Kagoshima, JAPAN; 7Kyoto University, Otsu, JAPAN; 8National Institutes for Quantum and Radiological Science and Technology, Tokai, JAPAN |
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**Poster Session 2 - Tuesday @ 2:00 - 3:15 PM**

Poster Board size 42 inches high by 42 inches wide (107cm x 107cm)
See link to poster guidelines under Author Instructions at PREPsymposium.org

| P-T-238 | Design of Two-step Sequential Centrifugal Partition Chromatography Processes for the Separation of Intermediately-eluting Target Components. Raena Morley, Clarissa Regler, Mirjana Mineva, Technical University of Munich, Freising, GERMANY |
| P-T-240 | Centrifugal Partition Chromatography: Applications, Methods, Columns. Sébastien Chollet¹, Luc Marchal², Jean-Hugues Renault³, ¹Capacités SA, Saint-Nazaire, FRANCE; ²University of Nantes, Saint-Nazaire, FRANCE; ³University of Reims Champagne Ardenne, Reims, FRANCE |
| P-T-241 | Challenges and Mitigations of Column Pressure for Scaling-up Hydrophobic Interaction Chromatography. Michael Grooms, Robert Luo, Kent Goklen, GlaxoSmithKline, King of Prussia, PA, USA |
| P-T-243 | Novel Achiral Purification Methodologies towards Expansion of the Chemistry Space. Chao Li, Jim Bradow, Alex (Xiaochun) Wang, Jason Smith K, Laurence Phillippe, Pfizer Inc, Groton, CT, USA |
| P-T-244 | Protein/Peptide Separations using Sepax PolyRP 10-300 Bulk Resins. Huiming Mao¹, Ke Yang¹, Xueying Huang¹, Guiyin Wang², Xinmei Hu², ¹Sepax Technologies, Inc., Newark, DE, USA; ²Sepax Technologies, Inc., Suzhou, CHINA |
| P-T-245 | Sensitivity to Isotherm Details of Accurate Description of Elution Peak Shape in Ion Exchange Chromatography of Proteins. Vijesh Kumar¹, William Heymann², Eric von Lieres³, Fabrice Schlegel³, Christian Kunert³, Karin Westerberg³, Abraham Lenhoff¹, ¹University of Delaware, Newark, DE, USA; ²Forschungszentrum, Julich, Julich, GERMANY; ³Amgen, Cambridge, MA, USA |
| P-T-246 | Evaluation of Chromatofocusing and Related Ion Exchange Methods as Alternatives to Protein A Chromatography in the Purification of Therapeutic Antibodies. Yang Liu¹, Sevda Delidar¹, Hui Guo¹, Chittoor Narahari² Rao², Ronald Bates³, Ryan Swanson³, Zheng Jian Li³, Sanchayita Ghose², Douglas Frey¹, ¹University of Maryland, Baltimore County, Baltimore, MD, USA; ²Bristol-Myers Squibb, Devens, MA, USA; ³Bristol-Myers Squibb, East Syracuse, NY, USA |
| P-T-247 | Development and Validation of an IMAC Purification Platform for His-Tagged Proteins Expressed in a CHO Cell-Free System. Sevda Delidar¹, Hui Guo², Yang Liu¹, Manohar Pilli¹, Govind Rao¹, Douglas Frey¹, ¹University of Maryland, Baltimore County, Baltimore, MD, USA; ²Shimadzu Scientific Instruments, Columbia, MD, USA |
| P-T-248 | Fundamental Studies of the Mechanism of Ion Exchange Chromatography: Why Does Chromatofocusing Work? Payam Rezaei, Douglas Frey, University of Maryland, Baltimore County, Baltimore, MD, USA |
| P-T-249 | Thermodynamic Analysis of the Adsorption of Proteins onto Ion Exchange Chromatography Resins: Basic Proteins – Cation Exchange Chromatography Gels. João Cardoso, Noriko Yoshimoto, Shuichi Yamamoto, Yamaguchi University, Ube, JAPAN |
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