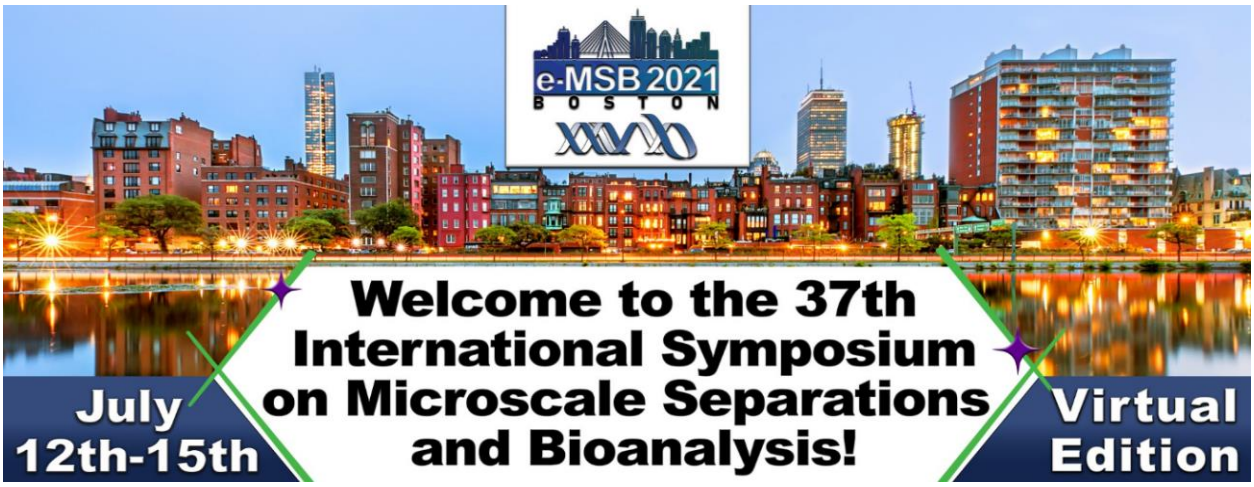


MSB 2021 Final Program

ON-DEMAND viewing for all time zones

WATCH ON DEMAND

All times EDT [CEST = EDT + 6 h, PDT = EDT - 3 h]

www.msb-conferences.org

38th International Symposium on Microscale Separations and Bioanalysis

MAIN TOPICS

- Advances in microscale CE and LC separations
- Microscale separation systems coupled to MS and IMS
- Electrodriven separations and SERS detection
- Microscale sample preparation for bioanalysis
- Pharma and biopharma applications
- Biomarkers for precision medicines
- Microscale separations for -omics sciences
- Materials for microfluidic/lab-on-chip systems
- Digital Microfluidics, Droplet Microfluidics, Centrifugal Microfluidics
- Sensor fabrication technologies (3D printing, lithography, etc)
- Biomarkers and functionalisation
- Microfluidic platforms for integrated separation and detection
- Point-of-care devices / from lab-on-chip systems towards applications
- Advances in organ-on-chip engineering

CONCEPT OF THE SYMPOSIUM

- State-of-the-art science, cutting-edge technology
- Double-blind peer review of abstracts
- 2/3 of programme from submitted abstracts
- Extended discussion time for presentations
- Young researcher session and career workshop
- Belgian meals and drinks included in registration fees
- Several awards offered

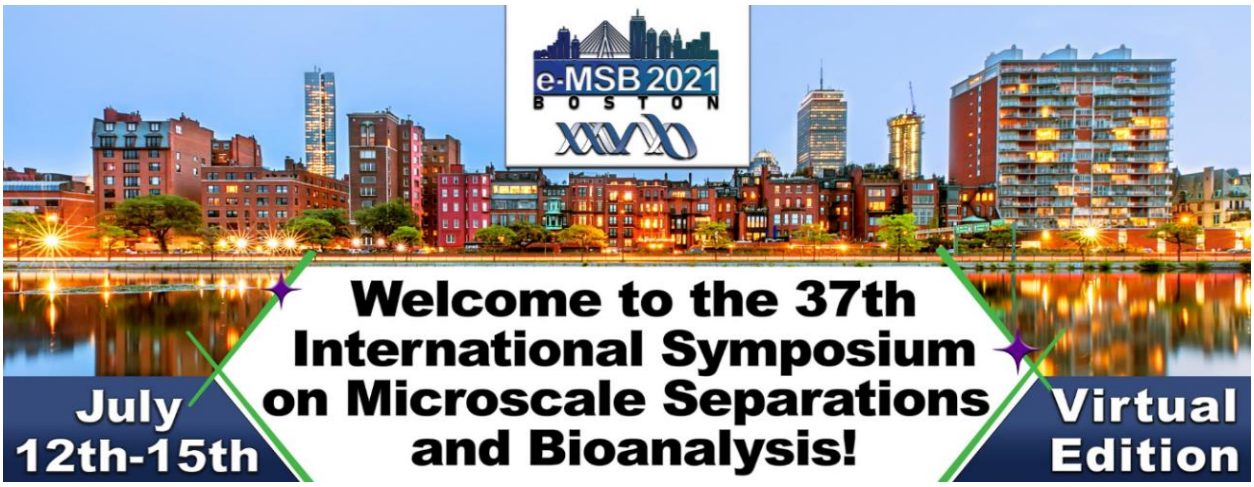
MSB2022LIÈGE

SYMPOSIUM CHAIRS

Marianne FILLET
Full professor at the University of Liège (ULiège, Belgium)
Head of the Laboratory for the Analysis of Medicines,
Faculty of Medicine

Heidi OTTEVAERE
Full professor at the Vrije Universiteit Brussel (VUB, Belgium)
Head of the Department of Applied Physics and Photonics,
Brussels Photonics, Faculty of Engineering

www.msb2022-conference.org



MSB 2021 Scientific Program

ON-DEMAND viewing for all time zones

WATCH ON DEMAND

All times EDT [CEST = EDT + 6 h, PDT = EDT - 3 h]

(KN) = Keynote Speaker; (YS) = Young Scientist Speaker; P-L=plenary paper #; L=oral paper #; P=poster

Welcome to MSB 2021. Close to the start date of the conference, each pre-registered conference participant will be sent a unique link that will permit entrance into the MSB 2021 virtual conference platform. **BE SURE YOU PRE-REGISTER TO RECEIVE YOUR UNIQUE LINK!** Once you access the virtual platform, you will be able to visit lectures and live discussions, view poster presentations and hear poster pitches, attend free eScience Café Seminars and tutorial, visit booths, meet exhibitors and sponsors, navigate the site for “Resources” and “Networking Topics”, attend researcher award presentations, and learn during the closing ceremony the winner of the Young Scientist Award and winners of the Best Poster Competition. **VIEWING ON-DEMAND FOR ALL TIME ZONES!** The virtual conference platform and contents will remain open to registered participants during the dates of the conference, and for 30 days after the conference for on-demand viewing of pre-recorded oral, tutorial and seminar presentations after which the presentations will be removed from the server. MSB 2021 pre-recorded presentations will not be recorded nor archived. Rights of the pre-recorded presentation talks stay with the authors.

Welcome from the Chairs of e-MSB 2021

We are very pleased to welcome you to the 37th International Symposium on Microscale Separations and Bioanalysis (e-MSB 2021, virtual edition) being held in Boston, MA, USA on July 12-15, 2021.

Originally launched as the HPCE symposium in Boston, MA in 1989, MSB has rapidly transformed to become the premier annual forum at the bleeding edge of microscale separation science and bioanalysis. MSB 2021 honors this legacy by pushing the frontiers of microscale separation research, from fundamental technology development to high-impact applications relevant to health, medicine, food, forensics, and the environment. The meeting is structured with plenary and parallel oral sessions, poster sessions and pitches, e-Science Café seminars, exhibits, and a tutorial. To assist you in navigating the impressive program and provide an immersive conference experience that mimics the collegial atmosphere of in-person MSB meetings, we partnered with Virtual Creative Studios.

The action-packed scientific program, which is open to all registered delegates, is designed to engage scientists working across the vibrant landscape of bioanalytical research. In addition to 30 invited plenary and keynote lectures by world-renowned experts, the MSB 2021 scientific program comprises over 110 oral presentations that have been selected by double-blind review, thereby ensuring a focus on scientific innovation and impact. With more than 50% of the oral presenters being 35 years of age or younger, MSB 2021 truly gives the floor to the next generation of thought leaders who will shape the future of separation science and microanalysis.

MSB has a long history as a very collegial meeting with a strong sense of community. The success of MSB 2021 will depend not only on the outstanding cast of expert and world-renowned speakers but also on the interactions that take place among the attendees over the virtual platform. Therefore, in each keynote and oral presentation, 1/3 of the time is purposely reserved for rigorous discussion to stimulate the exchange of ideas and information. The symposium encourages lively, sometimes provocative scientific discussions between participants. And while our Session Chairs may frequently offer up the first question, we implore all delegates to go 'all-in' on these discussions as well. Let's make sure MSB 2021 sets a new standard for vigorous yet respectful scientific dialog!

With Boston as this year's host city, in addition to the vibrant academic research in numerous universities, colleges, and hospitals of the Greater Boston Area, we wanted to bring special attention to the thriving local ecosystem of biotechnology and pharmaceutical research. This year, we formed the Industrial Advisory Committee (IAC) for the first time in the history of the MSB symposia. IAC members have been outstanding conference ambassadors helping to ensure a strong presence for our local industry colleagues at MSB 2021.

If you have not yet registered, NOW is the time to act so that you don't miss a single minute of the symposium - there is still room for new delegates. Please visit the symposium's webpage at www.msb-conferences.org to register and get the latest information about the exciting program for MSB 2021.

At the beginning of the symposium, we would like to thank YOU for your contribution and participation, as well as our sponsors for their generous support. Without delegates and sponsors, there would be no symposium. We look forward to 'seeing' all of you in Boston for MSB 2021!

Alexander R. Ivanov
SYMPOSIUM CHAIR
Barnett Institute of Chemical and Biological Analysis
Northeastern University

Kimberly Hamad-Schifferli
SYMPOSIUM CO-CHAIR
University of Massachusetts Boston

Jarrod A. Marto
SYMPOSIUM CO-CHAIR
Dana-Farber Cancer Institute
Brigham and Women's Hospital
Harvard Medical School

Access - Networking Topics - Resources

By Sunday, July 11, each pre-registered delegate will receive an email with instructions to access the MSB 2021 virtual platform. The email will be sent by vizzi.live to the email that the registrant used when registering to attend the conference. If you do not receive the email from vizzi.live, please check your spam filter.

Check out “Your Guide to Attending the Virtual Conference”
– Follow the link below, or click the link posted at msb-conferences.org
https://msb-conferences.org/wp-content/uploads/2021/07/e-MSB-Attendee-Guide-for-website.pdf

The action-packed scientific program is designed to engage scientists working across the vibrant landscape of bioanalytical research. On the virtual platform, be sure to navigate to the tab “Networking Topics” to explore and interact:

- Career Hub
- Students & Postdocs
- Separations
- Detectors
- Automation
- Applications
- Microfluidics
- Topics for Future MSB Conferences

Resources and Swag Bag
On the virtual platform, navigate to the tab “Resources” to view, download or save the following documents for future use:

- Final Program
- Book of Abstracts
- Free Tutorial and Seminars Handout
- Bruker Innovation
- SCIEX Power of Precision
- VICI True Nano
- Next Year’s MSB 2022

View Talks On-Demand: At the end of each session, each pre-recorded talk becomes available for viewing On-Demand. At the end of each day, live Q&A will become a part of each On-Demand talk. On-Demand will remain accessible on the conference platform for 30 days after the conference.

We are grateful for the generous support from the following sponsors:

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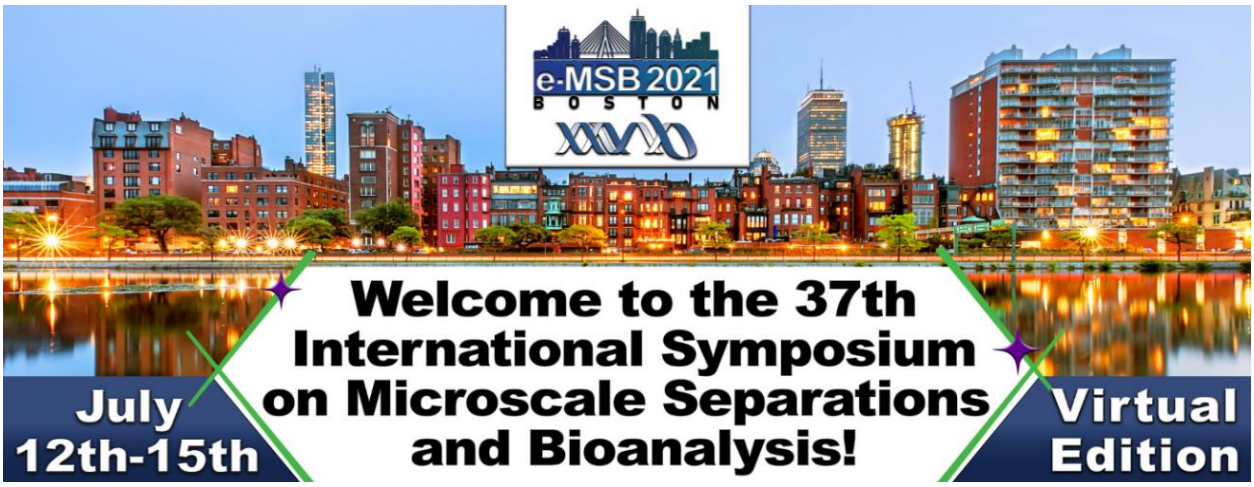

Tutorial & eScience Café Seminars

At-A-Glance

MONDAY, JULY 12 at 12:10 pm – 12:55 pm

- Tutorial on “Capillary Iso-Electric Focusing (CIEF) – Prime Methodology for Protein Characterization” (presented by Gerard Rozing)
- eScience Café Seminar on “Combining the Power of a Core-Shell Particles and Advanced Stationary Phase Selectivity to Improve Micro and Nano Flow Separations" (sponsored by Phenomenex, Silver sponsor)

TUESDAY, JULY 13 at 12:35 pm – 1:20 pm

- eScience Café Seminar on "Microscale Separations at Nanoscale" (sponsored by VICI, Gold sponsor)
- eScience Café Seminar on "Is Structures for Lossless Ion Manipulation (SLIM) a One Trick Pony or a One Stop Shop for Ion Mobility-Mass Spectrometry Analysis?" (sponsored by MOBILion Systems, Inc., Silver sponsor)

WEDNESDAY, JULY 14 at 12:35 pm – 1:20 pm

- eScience Café Seminar on “Latest Applications of 4D-Proteomics using Trapped Ion Mobility on the timsTOF Pro 2” and 4D Proteomics – Dissecting the 3D Structure of Proteins through Ion Mobility Enhanced Crosslinking Mass Spectrometry” (sponsored by Bruker, Gold sponsor)
- eScience Café Seminar on “Comprehensive, 15-min Charge Variant Analysis of Biotherapeutics with a Microfluidic Chip-Based Integrated iCIEF-MS System” (sponsored by SCIEX, Gold sponsor)

THURSDAY, JULY 15 at 12:35 pm – 1:20 pm

- eScience Café Seminar on “Advancing Denaturing and Native Top-down Proteomics Analysis using CE-MS” (sponsored by Agilent, Silver sponsor)

Monday Morning, July 12, 2021
Oral Presentations and Live Q&A
(time wise split in 2/3 talk and 1/3 discussion)
8:35am – 11:55am

Monday Opening Ceremony

8:30 am **Opening Ceremony**

- Alexander Ivanov, Chair MSB 2021, Barnett Institute of Chemical and Biological Analysis, Northeastern University, Boston, MA, USA
- Kimberly Hamad-Schifferli, Co-Chair MSB 2021, University of Massachusetts Boston, Boston, MA, USA
- Jarrod Marto, Co-Chair MSB 2021, Dana-Farber Cancer Institute, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA

Monday Founder's Lecture 1

8:55 am **Session Introduction**
Alexander Ivanov, Barnett Institute of Chemical and Biological Analysis, Northeastern University, Boston, MA, USA

9:00-9:30 am (P-L-101) **Microscale Bioseparations and Analysis: A Look into the Past and the Future**
BARRY L. KARGER, James L. Waters Emeritus Chair and Distinguished Professor, Barnett Institute Emeritus Director, Northeastern University, Boston, MA, USA

Monday Plenary Lecture 2

9:30 am **Session Introduction**
Alexander Ivanov, Barnett Institute of Chemical and Biological Analysis, Northeastern University, Boston, MA, USA

9:35-10:10 am (P-L-102) **Robust and In-depth Work Flows for Single Cell and Clinical Proteomics**
MATTHIAS MANN, Max Planck Institute of Biochemistry, Planegg, GERMANY

10:10-10:25 am **eScience Café Break with Sponsored Videoclip**

Monday Parallel Session 1: Analysis of Pharmaceutical Proteins and New Modalities of Biopharmaceuticals

(Session sponsored by SCIEX)

10:25 am **Session Introduction**
SESSION ORGANIZER AND CHAIR: Li Zang, Director, Protein Analytics, Science and Technology, Operations, AbbVie Bioresearch Center, Inc., Worcester, MA, USA
CO-CHAIR: Maggie A. Ostrowski, Senior Manager, Marketing, SCIEX, Fremont, CA, USA

10:30 am (L-103) (KN) **High Sensitivity Charge Variant Assessment of Biopharmaceuticals using ZipChip® Microchip Electrophoresis Coupled to Orbitrap Mass Spectrometry.** Sara Carillo, Florian Fuessl, Tomos Morgan, Craig Jakes, Jonathan Bones, National Institute for Bioprocessing Research and Training, Dublin, IRELAND

10:55 am (L-104) **MicroFlow Size-exclusion Chromatography Enables Enhanced Native Mass Spectrometry of Proteins and Complexes.** Iro Konstantina Ventouri[1], Sharene Veelders[1], Patrick Endres[2], Regina Roemling[2], Peter J. Schoenmakers[1], Govert W. Somsen[3], Rob Haselberg[3], Andrea Gargano[1], [1]van 't Hoff Institute for Molecular Science, University of Amsterdam, Amsterdam, THE NETHERLANDS; [2]Tosoh Bioscience GmbH, Griesheim, GERMANY; [3]Division of BioAnalytical Chemistry, Amsterdam Institute for Molecules Medicines and Systems, Vrije Universiteit Amsterdam, Amsterdam, THE NETHERLANDS

11:10 am (L-106) **Expanding Functional Antibody Characterization to Proteoforms: Affinity CE-MS to Study Antibody – FcRs Interactions.** Elena Dominguez-Vega, Leiden University Medical Center, Leiden, THE NETHERLANDS

11:25 am (L-107) (YS) **Rapid Analysis of a Cysteine-linked Antibody-drug Conjugate by Liquid Chromatography Coupled to Fourier Transform Ion Cyclotron Resonance Mass Spectrometry.** Eli Larson[1], Yanlong Zhu[1], Zhijie Wu[1], Bifan Chen[1], Zhaorui Zhang[2], Shiyue Zhou[2], Linjie Han[2], Qunying Zhang[2], Ying Ge[1]; [1]University of Wisconsin-Madison, Madison, WI, USA; [2]AbbVie Inc., North Chicago, IL, USA

11:40-11:55 am (L-105) (YS) **Characterization of Bispecific T Cell Engager (BiTE) Antibody Fragmentation Sites using Capillary Electrophoresis Coupled to Mass Spectrometry (CE-MS).** Arnik Shah[1], Weidong Cui[1], John Harrahy[2], Aditya Kulkarni[2], Alexander Ivanov[4], [1]Amgen Inc., Cambridge, MA, USA; [2]908 Device, Boston, MA, USA; [4]Northeastern University, Boston, MA, USA

Monday Parallel Session 2: Microscale Techniques in Forensic Analysis

10:25 am **Session Introduction**
SESSION ORGANIZER AND CHAIR: Adam Hall, Assistant Professor, Biomedical Forensic Sciences Program, Boston University School of Medicine, Boston, MA, USA

10:30 am (L-108) (KN) **Improvements in Sampling and Detection of VOCs Associated with Drugs and Explosives using Capillary Microextraction.** Jose Almirall, Department of Chemistry and Biochemistry, Florida International University, Miami, FL, USA

10:55 am (L-109) (YS) **A Biocompatible Solid Phase Microextraction and Direct Analysis in Real Time Mass Spectrometry Method to Detect Drugs of Abuse in Human Breast Milk.** Emily Woods, Baylor University School of Medicine, Brookline, MA, USA

11:10 am (L-110) (YS) **Performance Evaluation of a Commercial Handheld Raman-spectrometer for Cocaine Detection in Street Samples.** Joshka Verduin[1,2], Ruben Kranenburg[1,2], Arian van Asten[3]; [1]Forensic Laboratory Dutch National Police Unit Amsterdam, Amsterdam, THE NETHERLANDS; [2]Van 't Hoff Institute for Molecular Sciences, University of Amsterdam, Amsterdam, THE NETHERLANDS; [3]Co van Ledden Hulsebosch Center (CLHC), Amsterdam Center for Forensic Science and Medicine, Amsterdam, THE NETHERLANDS

11:25 am (L-111) (YS) **Porous Thin Film: An Efficient Sampling Device and a Single use Electrospray Substrate for Rapid Extraction from Biofluid Spots and Direct Analysis with Mass Spectrometry.** Ali Azizi, Fereshteh Shahhoseini, Christina Bottaro, Memorial University of Newfoundland, St. John's, CANADA

11:40-11:55 am (L-112) **Nanomanipulation-coupled to Nanospray Mass Spectrometry for the Analysis of Ultra-trace Forensic and Single Cell Chemical Determination.** Guido Verbeck, University of North Texas, Denton, TX, USA

11:55 am-12:10 pm **eScience Café Break with Sponsored Videoclip**

Monday, July 12, 2021
Free Tutorial
sponsored by AES Life Sciences
12:10 – 12:55pm

Monday Free Tutorial
(Tutorial sponsored by AES Life Sciences)
Capillary Iso-Electric Focusing (CIEF) – Prime Methodology for Protein Characterization
Presented by Gerard Rozing, Consultant with Advanced Electrophoresis Solutions, Cambridge, ON, CANADA

Since the inception of iso-electric focusing (IEF) as a high-resolution electrophoretic technique for the separation of amphoteric substances by Tiselius and Vestenberg, it has become an indispensable method for the separation of protein mixtures. Initially, IEF was executed on a flat surface coated with a gel mixed with ampholytes to establish the pH gradient. The sample is applied to the center of the plate. This so-called slab gel IEF became more sophisticated by using flat surfaces with an immobilized pH gradient (IPG). With the introduction of instruments for Capillary Electrophoresis, the technique was adapted to allow execution in-the capillary and subsequent, online optical detection (capillary iso-electric focusing, CIEF). This was followed by dedicated whole-column-image-detection electrophoresis systems (iCIEF). With the commercialization of CIEF, the methodology has evolved into a recipe-driven, black-box approach. The users strictly follow a protocol provided by the system supplier. Therefore, the basic understanding of the separation mechanism on IEF has faded. Diagnosis and troubleshooting when “it does not work” become an insurmountable hurdle, and the costly help of the system supplier is called. Therefore, there is a continuing need and effort for teaching the basic principles of iso-electric focusing, especially when applied in capillaries (CIEF). In this tutorial lecture, the author will emphasize on: (a) Basics of iso-electric focusing and in capillary execution. (b) Method development of CIEF. (c) Instrumentation for CIEF and iCIEF. (d) Tools for capillary iso-electric focusing method development. (e) Preparative CIEF. (f) Coupling of CIEF with Mass Spectrometric Detection. In the spirit of the MSB symposia series, the author will fill 2/3 of the allocated time on presentation leaving 1/3 for Q&A.

Monday, July 12, 2021
Free eScience Café Seminar
sponsored by Phenomenex
12:10 – 12:55pm

Monday Free eScience Café Seminar sponsored by PHENOMENEX
Combining the Power of a Core-Shell Particles and Advanced Stationary Phase Selectivity to Improve Micro and Nano Flow Separations
Presented by Jason A. Anspach, Global Product Manager HPLC, Phenomenex, Torrance, CA, USA

It has long been shown that by improving separation quality one can substantially improve the quality of the mass spectrometry data. Improvements including the ability to resolve and detect isobaric compounds, reducing spectrum complexity for the improved sampling of unknowns, or improvements in detection limits can all be accomplished via improvements in LC separations. The two most powerful tools to improve LC separations are improvements in column efficiency, and enhancements in stationary phase selectivity. While there are a vast number of publications discussing methods to improve both efficiency and selectivity in analytical scale separations, these topics have largely been ignored in micro and nano scale separations. In this workshop we will show how the use of core-shell based HPLC materials, long known to significantly improve efficiency in analytical HPLC, and alternate stationary phase bonding chemistries can be used in micro and nano scale LC/MS analysis to improve separation quality and provide better sensitivities.

Monday Afternoon, July 12, 2021
Exhibits – Posters – Poster Pitches – Networking
12:55pm – 2:10pm

Networking and Building Connections
Vendor Booths in the Exhibit Hall
Poster Session and Poster Pitches in the Poster Hall

Monday Afternoon, July 12, 2021
Oral Presentations and Live Q&A
(time wise split in 2/3 talk and 1/3 discussion)
2:10pm – 6:05pm

Monday Plenary Lecture 3
(Lecture sponsored by journal, *Lab on a Chip*)

2:10 pm **Session Introduction**
Kimberly Hamad-Schifferli, University of Massachusetts Boston, Boston, MA, USA

2:15-2:50 pm (P-L-113) **Electrophoretic Cytometry: Single-cell and Sub-cellular Targeted Proteomics using Microfluidic Design**
AMY E. HERR, University of California, Berkeley, Berkeley, CA, USA

Monday Parallel Session 3: New Developments in Omics Technologies

2:50 pm **Session Introduction**
SESSION ORGANIZER AND CHAIR: Rawi Ramautar, Associate Professor, Leiden University, Leiden Academic Centre for Drug Research, Leiden, THE NETHERLANDS

2:55 pm (L-114) (KN) **On-line Preconcentration by Solid-phase Extraction Capillary Electrophoresis-mass Spectrometry: A Simple Three-dimensional Tool for High-throughput and Sensitive Analysis of Biomarkers in Omics Research.** Fernando Benavente, Roger Pero-Gascon, Hiba Salim, Montserrat Mancera-Arteu, Estela Giménez, Victoria Sanz-Nebot, University of Barcelona, Barcelona, SPAIN

3:20 pm (L-115) (YS) **Profiling Acidic Metabolites by Capillary Electrophoresis-Mass Spectrometry in Low Numbers of Mammalian Cells using a Novel Chemical Derivatization Approach.** Marlien van Mever, Cornelius Willacey, Wei Zhang, Nicolas Drouin, Jaco van Veldhoven, Daan van der Es, Thomas Hankemeier, Rawi Ramautar, Leiden University, Leiden, THE NETHERLANDS

3:35 pm (L-116) (YS) **Ultrasensitive Capillary Electrophoresis Ion Mobility Mass Spectrometry for Targeted Peptidomics of Mouse Brain Tissue Regions.** Kellen DeLaney[1], Sam Choi[1], Zhe Yu[2], Paul Marvar[2], Peter Nemes[1], [1]University of Maryland, College Park, MD, USA; [2]The George Washington University, Washington, DC, USA

3:50 pm (L-117) (YS) **Quantitative Nanoflow LC-MS/MS Enables High-dimension Chemoproteomic 'Library versus Library' Screening for Inhibitor Discovery against Endogenous DUB as an Emergent Target Class.** Wai Cheung Chan[1], Sara Buhrlage[2], Jarrod Marto[2], [1]Harvard University, Boston, MA, USA; [2]Dana-Farber Cancer Institute, Boston, MA, USA

4:05 pm (L-118) (YS) **Data-independent Acquisition for Ultrasensitive Proteomics using Capillary Electrophoresis-electrospray Ionization High-resolution Mass Spectrometry.** Bowen Shen, Leena Pade, Kellen DeLaney, Peter Nemes, University of Maryland, College Park, MD, USA

4:20-4:35 pm (L-119) (YS) **Large Scale Top-down Proteomics on Arabidopsis Leaf Proteins and Chloroplast.** Qianjie Wang, Peter Lundquist, Liangliang Sun, Michigan State University, East Lansing, MI, USA

Monday Parallel Session 4: Biomarker Discovery and Validation

(Session sponsored by Agilent)

2:50 pm **Session Introduction**
SESSION ORGANIZER AND CHAIR: James L. Edwards, Associate Professor, Department of Chemistry, Saint Louis University, St. Louis, MO, USA

2:55 pm (L-120) (KN) **Development of Automated Multiplexed Assays for Cancer-related Proteins in Tumor Tissue Samples using Immuno-mass Spectrometry.** Christoph Borchers, McGill University, Montreal, QC, CANADA

3:20 pm (L-121) **Oxylipins as Early Markers of Cardiometabolic Health in Young Adults.** Xinyu Di[1], Lucas Jurado Fasoli[2], Wei Yang[1], Thomas Hankemeier[1], Jonatan Ruiz[2], Patrick Rensen[3], Borja Martinez-Tellez[3], Isabelle Kohler[4], [1]Leiden Academic Center for Drug Research, Leiden, THE NETHERLANDS; [2]University of Granada, Granada, SPAIN; [3]Leiden University Medical Centre, Leiden, THE NETHERLANDS; [4]Vrije Universiteit, Amsterdam, THE NETHERLANDS

3:35 pm (L-122) **A Point-of-Care Suitable Assay for MicroRNA Detection and Quantitation using Liquid Biopsy Samples.** Anastassia Kanavarioti[1], Janette Bernasconi[1], Albert Kang[1], William Jack[2], [1]Yenos Analytical LLC, El Dorado Hills, CA, USA; [2]New England Biolabs, Ipswich, MA, USA

3:50 pm (L-123) (YS) **Finding the Sweet Spot of Prostate-specific Antigen.** Alan B. Moran[1], Elena Domínguez-Vega[1], Jan Nouta[1], Tamas Pongrácz[1], Theo M. de Reijke[2], Manfred Wuhrer[1], Guinevere S.M. Lageveen-Kammeijer[1], [1]Leiden University Medical Center, Center for Proteomics and Metabolomics, Leiden, THE NETHERLANDS; [2]Amsterdam UMC Location, Academic Medical Center, Department of Urology, University of Amsterdam, Amsterdam, THE NETHERLANDS

4:05 pm (L-124) **Deep Steroidome Annotation Enables Fine Mechanistic Insights in Toxicology Risk Assessment.** Víctor González-Ruiz[1], Melanie Patt[2], Julien Boccard[1], Alex Odermatt[2], Serge Rudaz[1], [1]University of Geneva, Geneva, SWITZERLAND; [2]University of Basel, Basel, SWITZERLAND

4:20-4:35 pm (L-125) **MALDI MS Imaging of Carbon–carbon Double Bond Positional Isomers of Lipids Enabled by Off-line Reaction with Ozone.** Antonín Bednařík[1], Dominika Bezdeková[1], Jan Valášek[1], Monika Koktavá[1], Michal Hendrych[2], Jan Preisler[1], [1]Masaryk University Department of Chemistry, Brno, CZECH REPUBLIC; [2]Masaryk University, Department of Pathology, Brno, CZECH REPUBLIC

4:35-4:50 pm **eScience Café Break with Sponsored Videoclip**

Monday Parallel Session 5: Analysis of the Microbiome

4:50 pm **Session Introduction**
SESSION ORGANIZER AND CHAIR: Liangliang Sun, Assistant Professor, Department of Chemistry, Michigan State University, East Lansing, MI, USA

4:55 pm (L-126) (KN) **Opportunities for Analytical Chemists in Human Microbiome Research.** A. Sloan Devlin, Harvard Medical School, Boston, MA, USA

5:20 pm (L-127) **Electrophoretic Fractionation of Intact Microbes: A Preparative Method to Enhance Detection of Species within Complex Communities in Metagenomic Sequencing.** Bonnie Jaskowski Huge[1], Orlando DeLeon[2], John Kirby[2], Matthew Champion[1], Norman Dovichi[1], [1]University of Notre Dame, Notre Dame, IN, USA; [2]Medical College of Wisconsin, Milwaukee, WI, USA

5:35-5:50 pm (L-128) **Glycan Labeling-based Chemical Proteomics Strategy Enables Host and Pathogen Temporal Interaction Profiling (HAPTIP) in Nanoscale.** Ying Zhang[1], Haojie Lu[1], Weiguo Andy Tao[2], [1]Fudan University, Shanghai, CHINA; [2]Purdue University, West Lafayette, IN, USA

Monday Parallel Session 6: Advancements in Ion Mobility Spectrometry and Gas Phase Separation-based Analytical Techniques

(Session sponsored by MOBILion Systems, Inc.)

4:50 pm **Session Introduction**
SESSION ORGANIZER AND CHAIR: Susan E. Abbatiello, Interim Director, The Barnett Institute of Chemical and Biological Analysis, Department of Chemistry and Chemical Biology, Northeastern University, Boston, MA, USA

4:55 pm (L-129) (KN) **Increasing the Throughput, Specificity and Confidence in Omic Analyses using Multidimensional Measurements.** Erin Baker, James Dodds, Melanie Odenkirk, Karen Butler, Kaylie Kirkwood, MaKayla Foster, Allison Stewart, North Carolina State University, Raleigh, NC, USA

5:20 pm (L-130) (YS) **Establishing Native Trapped Ion Mobility Spectrometry of Biomolecules: How to Prevent System Potentials from Altering Protein Conformations.** Hany Majeed, Robert Voeten, Rob Haselberg, Isabelle Kohler, Govert Somsen, Vrije Universiteit Amsterdam, Amsterdam Institute of Molecular and Life Sciences, Division of Bioanalytical Chemistry, Amsterdam, THE NETHERLANDS and Centre for Analytical Sciences Amsterdam, Amsterdam, THE NETHERLANDS

5:35 pm (L-131) (YS) **Development of a Portable Measuring Device for the Detection of Pollutants in Water on the Basis of Nano-liquid Chromatography and Ion Mobility Spectrometry.** Tobias Werres[1,2], Christian Thoben[2], Ireneus Henning[3], Torsten C. Schmidt[4], Stefan Zimmermann[2], Thorsten Teutenberg[3], [1]Institut für Energie- und Umwelttechnik e. V. (IUTA); [2]Leibniz University Hannover, Hannover, GERMANY; [3]Institut für Energie- und Umwelttechnik e. V. (IUTA), Duisburg, GERMANY; [4]University of Duisburg-Essen, Essen, GERMANY

5:50-6:05 pm (L-132) (YS) **PRM-LIVE with Trapped Ion Mobility Spectrometry and Its Application in Selectivity Profiling of Kinase Inhibitors.** He Zhu[1], Scott Ficarro[1], William Alexander[1], Laura Fleming[1], Guillaume Adelmant[1], Tinghu Zhang[2], Matthew Willetts[3], Jens Decker[4], Sven Brehmer[4], Mike East[5], Nathanel Gray[2], Gary Johnson[5], Gary Kruppa[6], Jarrod Marto[1], [1]Dana-Farber Cancer Institute Brigham and Women's Hospital and Harvard Medical School, Boston, MA, USA; [2]Department of Chemical and Systems Biology and ChEM-H, Stanford University School of Medicine, Stanford, CT, USA; [3]Bruker Daltonics Inc, Billerica, MA, USA; [4]Bruker Daltonik GmbH, Bremen, GERMANY; [5]School of Medicine, University of North Carolina, Chapel Hill, NC, USA; [6]Bruker S.R.O., District Brno-City, CZECH REPUBLIC

Tuesday Morning, July 13, 2021
Oral Presentations and Live Q&A
(time wise split in 2/3 talk and 1/3 discussion)
8:30am – 12:30pm

Tuesday Award Session for SCIEX Microscale Separations Innovations Medal and Award for Current and Breakthrough Research in the Field of Electrodriven Separations
Plenary Lecture 4

8:25-8:30 am **Session Introduction**
Jarrod Marto, Co-Chair MSB 2021, Dana-Farber Cancer Institute, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA

8:30-8:35 am Jörg Kutter, President of the Society for Microscale Separations and Bioanalysis, University of Copenhagen, Copenhagen, DENMARK

8:35-8:45 am **Presentation of the SCIEX Award**

8:45-9:20 am (P-L-201) **Biosignatures, Electrophoresis, and the Search for Life Beyond Earth**
PETER WILLIS, Group Supervisor, Chemical Analysis and Life Detection, NASA Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

9:20-9:25 am **eScience Café Break with Sponsored Videoclip**

Tuesday Parallel Session 7: Microfluidic Chip-based Electrophoresis. Fundamentals and Novel Applications

9:25 am **Session Introduction**
SESSION ORGANIZER AND CHAIR: Chengxi Cao, Full Professor with Tenure, Department of Instrument Science and Engineering, Shanghai Jiao Tong University, Shanghai, CHINA

9:30 am (L-202) (KN) **Surface Plasmon Resonance Imaging the Fingerprints via Chemical Composition.** Yi Chen[1], Mingjie Li[2], Jiying Xu[1], [1]Institute of Chemistry CAS, Beijing, CHINA; [2]University of Chinese Academy of Sciences, Beijing, CHINA

9:55 am (L-203) **Multiplex Detection of SARS-CoV-2 Variants of Concerns using ARMS-PCR on LabChip® GX Touch™ Nucleic Acid Analyzer.** Zhi-xiang Lu, Michael Miller, Macy Veling, Thomas Perroud, Yanhong Tong, PerkinElmer Inc., Waltham, MA, USA

10:10 am (L-204) **Asymmetric Peak Behaviour in Free-flow Counterflow Gradient Focusing.** Matthew Courtney, Tomasz Glawdel, Carolyn Ren, University of Waterloo, Waterloo, CANADA

10:25 am (L-205) (YS) **Micro-scale Concentration by Leading Electrolyte-free Conductive Wall Isotachophoresis.** Steven Doria, Zachary Gagnon, Texas A&M University, College Station, TX, USA

10:40-10:55 am (L-206) **Non Aqueous Capillary Electrophoresis on Thiolene-based Microfluidic Devices with an Integrated Electrospray Interface.** Nan Lu, Andreas Kretschmann, Nickolaj Petersen, Jörg Kutter, University of Copenhagen, Copenhagen, DENMARK

Tuesday Parallel Session 8: Microsampling and Microscale Sample Preparation Techniques

9:25 am **Session Introduction**
SESSION ORGANIZER AND CHAIR: Tomasz Bączek, Professor, Head of the Department, Department of Pharmaceutical Chemistry, Medical University of Gdańsk, Gdańsk, POLAND

9:30 am (L-207) (KN) **Diffusion-based Separation and Extraction using Bidirectional Electroosmotic Flow.** Vesna Bacheva[1], Federico Paratore[2], Maya Dolev[1], Baruch Rofman[1], Govind Kaigala[3], Moran Bercovici[1], [1]Technion, ISRAEL; [2]IBM Research Zurich, SWITZERLAND; [3]IBM Research Europe, SWITZERLAND

9:55 am (L-208) (YS) **New Magnetic Bead-based Strategies for Extracellular Vesicle Isolation: Towards Microfluidic Droplet Operation.** Marco Morani, Myriam Taverna, Thanh Duc Mai, Institut Galien Paris Saclay, Paris, FRANCE

10:10 am (L-209) (YS) **Extracellular Fluid Collection, Neurotransmitter, and Proteome Analysis of Drosophila Melanogaster Brain Tissue with Low-flow Push-pull Perfusion.** Patrick Fisher, Stephanie Cologna, Scott Shippy, University of Illinois at Chicago, Chicago, IL, USA

10:25 am (L-210) **High-throughput Solid Phase Microextraction Method for Determination of Plasma Protein Binding.** M. James Ross, Olga Shimelis, Hugh Cramer, Teresa Marsala, Yong Chen, MilliporeSigma, Bellefonte, PA, USA

10:40-10:55 am (L-211) (YS) **Combining In Vivo Microsampling with Capillary Electrophoresis High-Resolution Mass Spectrometry (CE-HRMS) Enabled Proteo-metabolomic Single-cell Systems Biology.** Jie Li[1], Camille Lombard-Banek[1], Erika Portero[1], Rosemary Onjiko[2], Chase Singer[1], David Plotnick[2], Reem Al Shabeeb[2], Peter Nemes[1], [1]Department of Chemistry and Biochemistry, University of Maryland College Park, College Park, MD, USA; [2]Department of Chemistry, The George Washington University, Washington, DC, USA

10:55-11:00 am **eScience Café Break with Sponsored Videoclip**

Tuesday Parallel Session 9: Single-Cell Analysis

(Session sponsored by Bruker)

11:00 am **Session Introduction**
SESSION ORGANIZER AND CHAIR: Peter Nemes, Associate Professor, Department of Chemistry and Biochemistry, University of Maryland, College Park, MD, USA
CO-CHAIR: Tharan Srikumar, Bruker, Product Manager, R&D IPA Software, Toronto, ON, CANADA

11:05 am (L-212) (KN) **Improved NanoLC Separations for Single-Cell Proteomics.** Ryan Kelly, Brigham Young University, Provo, UT, USA

11:30 am (L-213) **High-throughput and High-efficiency Sample Preparation for Single-cell Proteomics using a Nested Nanowell Chip.** Jongmin Woo[1], Sarah Williams[1], Victor Aguilera-Vazquez[1], Ryan Sontag[1], Ronald Moore[1], Lye Meng Markillie[1], Hardeep Mehta[1], Joshua Cantlon[2], Joshua Adkins[1], Geremy Clair[1], Ljiljana Pasa-Tolic[1], Ying Zhu[1], [1]Pacific Northwest National Laboratory, Richland, WA, USA; [2]Scienion AG, Berlin, GERMANY

11:45 am (L-214) (YS) **Efficient Single Cell Proteomics Sample Preparation at High-throughput with Remarkable Sensitivity.** Claudia Ctortecka[1], David Hartlmayr[1], Anjali Seth[2], Guilhem Tourniaire[2], Karl Mechtler[1], [1]IMP, Vienna, AUSTRIA; [2]Cellenion, Lyon, FRANCE

12:00 pm (L-215) (YS) **Improved Sensitivity in Proteomic Profiling of Limited Samples using Novel MicroSPE-based Sample Preparation, Ultra-low Flow LC−MS, and FAIMS Interface.** Michal Gregus, James C. Kostas, Jan Schejbal, Somak Ray, Susan E. Abbatiello, Alexander R. Ivanov, Barnett Institute of Chemical and Biological Analysis, Department of Chemistry and Chemical Biology, Northeastern University, Boston MA, USA

12:15-12:30 pm (L-216) (YS) **Comparison of Photoactivatable Crosslinkers for In-gel Single-cell Immunoblotting.** Kristine Tan[1], Surbhi Desai[2], Erum Raja[2], Chris Etienne[2], Amy Herr[1], [1]University of California, Berkeley, Berkeley, CA, USA; [2]Thermo Fisher Scientific, Rockford, IL, USA

Tuesday Parallel Session 10: Biosensors and Bioaffinity Assays: Design and Development

11:00 am **Session Introduction**
SESSION ORGANIZER AND CHAIR: Hadley D. Sikes, Associate Professor, Department of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA, USA

11:05 am (L-217) (KN) **Skin-interfaced Wearable Biosensors.** Wei Gao, California Institute of Technology, Pasadena, CA, USA

11:30 am (L-218) **Comparative Quantitative Analysis of Plasmonic Polymer Nanocomposites as Reliable Optical Sensing Platforms.** Swarnapali De Silva Indrasekara, Casey Folks, Uttam Sharma, University of North Carolina Charlotte, Charlotte, NC, USA

11:45 am (L-219) (YS) **Comprehensive Online 2D-LC/MS Platform for Enzymatic Inhibitor Screening Assay: A Study of Conditions.** Ananda Ferreira Pires, Carmen Lúcia Cardoso, Claudia Seidl, University of São Paulo, Ribeirão Preto, BRAZIL

12:00 pm (L-220) (YS) **Carbamazepine Detection in Whole Human Saliva using an Electrochemical Sensor with Stencil-printed Electrodes.** Lael Wentland, Corey Downs, Elain Fu, Oregon State University, Corvallis, OR, USA

12:15-12:30 pm (L-221) **Towards Rethinking Nanosafety: Quantitative Assessment of the Nanomaterial Metabolite Corona by Capillary Electrophoresis-Mass Spectrometry.** Andrew Chetwynd[1], Wei Zhang[2], James Thorn[3], Iseult Lynch[1], Rawi Ramautar[2], [1]University of Birmingham, Birmingham, UK; [2]Leiden University, Leiden, THE NETHERLANDS; [3]AB Sciex UK Ltd., Warrington, UK

12:30-12:35 pm **eScience Café Break with Sponsored Videoclip**

Tuesday Afternoon, July 13, 2021
Free eScience Café Seminar
sponsored by VICI
12:35pm – 1:20pm

Tuesday Free eScience Café Seminar sponsored by VICI

Microscale Separations at Nanoscale

Presented by Jennifer Copeland, LC Product Manager, VICI, Houston, TX, USA

While microscale separations have been an intense area of study over the past few decades, application of these techniques for single-cell analysis of proteomes is newly possible. Novel efforts into cellular study are ongoing and wide-ranging, and there have been numerous methods of looking at protein makeup of an individual cell. Each of these technologies requires the ability to move nearly all (if not all) of a tiny sample to a separation modality and then to a detector. Moving to nanoscale has been challenging in multiple aspects, and this workshop will go over some of the history and methods developed, while discussing technology involved in ultra-high resolution packed-bed capillary chromatography. VICI's True NanoTM product line solves many common problems facing chromatography while taking advantage of column and detector improvements over the past few years. Join us as we discuss bringing the analytical power of liquid chromatography into the single-cell present.

Tuesday Afternoon, July 13, 2021
Free eScience Café Seminar
sponsored by MOBILion Systems
12:35pm – 1:20pm

Tuesday Free eScience Café Seminar sponsored by MOBILion Systems

Is Structures for Lossless Ion Manipulation (SLIM) a One Trick Pony or a One Stop Shop for Ion Mobility-Mass Spectrometry Analysis?

Presented by Daniel DeBord, Director of R&D, MOBILion Systems, Inc., Chadds Ford, PA, USA

Since 2014 SLIM has demonstrated unprecedented levels of ion mobility resolution and the potential impact of this resolution on both the depth and throughput of analysis. Integration has focused on the combination of high-resolution ion mobility (HRIM) with high resolution mass spectrometry (HRMS) in the form of time-of-flight instrumentation. This system configuration provides broad spectrum acquisition with fast analysis times, making it most suitable for discovery or characterization analyses where the goal is to see “everything” with as much specificity as possible. MOBILion has been working to evolve SLIM functionality to support targeted applications where the goal is to focus on certain analytes, and to be able to detect them as accurately and sensitively as possible, even within complex biological matrices. This presentation provides an overview of various designs of SLIM and shows how this platform technology can be tailored to enhance performance of all types of mass spectrometric detection.

Tuesday Afternoon, July 13, 2021
Exhibits – Posters – Poster Pitches – Networking
1:20pm – 2:35pm

Networking and Building Connections
Vendor Booths in the Exhibit Hall
Poster Session and Poster Pitches in the Poster Hall

Tuesday Afternoon, July 13, 2021
Oral Presentations and Live Q&A
(time wise split in 2/3 talk and 1/3 discussion)
2:35pm – 6:25pm

Tuesday Plenary Lecture 5

2:35 pm **Session Introduction**
Kimberly Hamad-Schifferli, University of Massachusetts Boston, Boston, MA, USA

2:40-3:15 pm (P-L-222) **Organoids Microphysiological Analysis Platforms (MAP) and Exosome Detection via the Ultrafast-isolation System (EXODUS)**
LUKE P. LEE, Professor, Harvard Medical School, Department of Medicine, Brigham Women's Hospital, Boston, MA, USA

Tuesday Parallel Session 11: Microscale Techniques in Biopharmaceutical R&D

3:15 pm **Session Introduction**
SESSION ORGANIZER AND CHAIR: Shujia (Daniel) Dai, Senior Principal Scientist, Lab Head, Proteomics, Translational Science, Sanofi US, Cambridge, MA, USA

3:20 pm (L-223) (KN) **Micro-scale Technologies Empower Drug Discovery and Development.** Katherine Klinger[1], Deepak Rajpal[1], Stephen Madden[1], William Weber[1], Bailin Zhang[2], Gejing Deng[2], Matthew Davison[2], Mikhail Levit[2], Shujia Dai[2], [1]Sanofi R&D, Framingham, MA, USA; [2]Sanofi R&D, Cambridge, MA, USA

3:45 pm (L-225) (YS) **Development of a Low-cost Nano ESI-MS Microfluidic Chip for Effective Mixtures and Detection of Biological Samples.** Jéssica Freire Feitor, Vinicius Guimarães Ferreira, Daniel Rodrigues Cardoso, Emanuel Carrilho, University of São Paulo, São Carlos, BRAZIL

4:00-4:15 pm Pause

4:15-4:30 pm (L-227) (YS) **Mono- and Disaccharide Monitoring in Cell Culture Medium by Capillary and Microchip Electrophoresis.** Debbie van der Burg, Cari Sänger - van de Griend, Kantisto, Baarn, THE NETHERLANDS

4:30-4:45 pm (L-244) **Capillary Gel Electrophoresis Characterization of New Modality Protein Therapeutics.** András Guttman[a], Csenge Filep[a], Márton Szigeti[b], Róbert Farsang[b], Markus Haberger[c], Dietmar Reusch[c], [a]Horváth Csaba Memorial Laboratory of Bioseparation Sciences, University of Debrecen, HUNGARY; [b]Translational Glycomics Group, Research Institute of Biomolecular and Chemical Engineering, University of Pannonia, Veszprem, HUNGARY; [c]Roche Diagnostics GmbH, Penzberg, GERMANY

Tuesday Parallel Session 12: New Applications and Developments in Electrodriven Separations

3:15 pm **Session Introduction**
SESSION ORGANIZER AND CHAIR: Myriam Taverna, Full Professor, Faculty of Pharmacy, University Paris Saclay, Institut Galien Paris Saclay, FRANCE

3:20 pm (L-228) (KN) **Liquid Extraction Surface Analysis Coupled with Capillary Electrophoresis.** Sunkyung Jeong, Doo Soo Chung, Seoul National University, Seoul, KOREA

3:45 pm (L-243) **Improved Biopharmaceutical Characterization Workflows for Next-Generation mAb-based Therapeutics.** Jose-Luis Gallegos-Perez, SCIEX, Framingham, MA, USA

4:00 pm (L-230) **Rapid Serum Lipid Profiling by Multisegment Injection-nonaqueous Capillary Electrophoresis-Mass Spectrometry: Expanding Coverage Beyond Hydrophilic Metabolites.** Ritchie Ly, Nicholas Ly, Philip Britz-Mckibbin, McMaster University, Hamilton, CANADA

4:15 pm (L-231) **Capillary Zone Electrophoresis Top-Down Proteomics for In-depth Proteoform Characterization.** Kevin Jooss, Bryon S. Drown, Rafael D. Melani, Neil L. Kelleher, Northwestern University, Departments of Chemistry and Molecular Biosciences, Evanston, IL, USA

4:30-4:45 pm (L-232) **Capillary Electrophoresis Connected with Inorganic as well as Organic Mass Spectrometry for Separation of Enantiomers.** Jan Petr, Daniel Baron, Petra Švecová, Tomáš Pluháček, Palacky University Olomouc, Olomouc, CZECH REPUBLIC

4:45-4:55 pm **eScience Café Break with Sponsored Videoclip**

Tuesday Parallel Session 13: Innovations in Microfluidic Systems

4:55 pm **Session Introduction**
SESSION ORGANIZER AND CHAIR: Elain Fu, Associate Professor of Bioengineering, School of Chemical, Biological, and Environmental Engineering, Oregon State University, Corvallis, OR, USA

5:00 pm (L-233) (KN) **Paper-based Microfluidic Biosensors for Viral and Serological Testing of COVID-19.** Xinyu Liu, University of Toronto, Toronto, CANADA

5:25 pm (L-234) (YS) **An Immunoglobulin Bioassay Implemented in a Laser Patterned Multilamellar Device Comprised of Dissimilar Functional Materials.** Saichon Sumantakul, Vincent Remcho, Oregon State University, Corvallis, Oregon, USA

5:40 pm (L-235) (YS) **Unraveling the Protective Mechanism of Biofluid Thin Films for use in Microsampling in Remote Settings.** Benjamin Frey, Deidre Damon, Danyelle Allen, Jill Baker, Sam Asamoah, Abraham Badu-Tawiah, The Ohio State University, Columbus, OH, USA

5:55 pm (L-236) **Two-capillary Nanoflow Sheath Liquid Interface for CE-MS based on a 3D-printed Device.** Alexander Stolz, Johannes Schlecht, Yvonne Kreutzer, Christian Neusüß, Aalen University, Aalen, GERMANY

6:10-6:25 pm (L-237) (YS) **Two in One: In Situ Hydrogel Formation in Microfluidics for One-step Competitive Assays.** Marco Rocca[1], Maxime Dufresne[2], Marie Salva[3], Christof Niemeyer[3], Emmanuel Delamarche[1], [1]IBM Research Zurich, Ruschlikon, SWITZERLAND; [2]ETH Zurich, Zurich, SWITZERLAND; [3]Karlsruhe Institute of Technology, Karlsruhe, GERMANY

Tuesday Parallel Session 14: Advanced Instruments and Instrument Components

4:55 pm **Session Introduction**
SESSION ORGANIZER AND CHAIR: Beatrix Ueberheide, Director of the Proteomics Laboratory and Associate Professor of Biochemistry and Molecular Pharmacology and Neurology, New York University Langone Health, New York, NY, USA

5:00 pm (L-238) (KN) **Towards Highly Reproducible, Time- and Cost-efficient Proteomics Sample Preparation of Larger Sample Cohorts.** Stefan Loroch, Dominik Kopczynski, Adriana C. Schneider, Cornelia Schumbrutzki, Ingo Feldmann, Eleftherios Panagiotidis, Roman Sakson, Fiorella A. Solari, Albert Sickmann, Leibniz Institute for Analytical Sciences, ISAS, Dortmund, GERMANY

5:25 pm (L-239) **Metal Ion Leaching of Common HPLC Hardware Substrates when Exposed to Pure Water, Methanol, and Acetonitrile and Its Impact on Separations.** Jesse Bischof, SilcoTek Corporation, Bellefonte, PA, USA

5:40 pm (L-240) (YS) **Orthogonal Solid-Phase Extraction-Contained-Electrospray Ionization Mass Spectrometry for Complex Lipid Mixture Analysis.** Benjamin Burris, Abraham Badu-Tawiah, The Ohio State University, Columbus, OH, USA

5:55 pm (L-241) **Spray-capillary: A Novel Device for Microsampling and Online Capillary Electrophoresis Mass Spectrometry Analysis.** Lushuang Huang[1], Jiaxue Li[1], Mulin Fang[1], Kellye Cupp-Sutton[1], Zhe Wang[1], Kenneth Smith[2], Si Wu[1], [1]University of Oklahoma, Norman, OK, USA; [2]Oklahoma Medical Research Foundation, Oklahoma City, OK, USA

6:10-6:25 pm (L-242) **Vibrating Sharp Edge Spray Ionization for Efficient and Flexible CE-MS Interfacing.** Lindsay Veltri, Peng Li, Tony DeBastiani, Steve Valentine, Lisa Holland, West Virginia University, Morgantown, WV, USA

Wednesday Morning, July 14, 2021
Oral Presentations and Live Q&A
(time wise split in 2/3 talk and 1/3 discussion)
8:40am – 12:30pm

Wednesday Plenary Lecture 6

8:40 am **Session Introduction**
Jarrod Marto, Dana-Farber Cancer Institute, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA

8:45-9:20 am (P-L-301) **Proteomics 3.0: "Space" the New Frontier**.
JOHN R. YATES, III, T. Casimir Bamberger, Sandra Pankow, Salvador Martinez de Bartolome Izquierdo, Departments of Molecular Medicine and Neurobiology, The Scripps Research Institute, La Jolla, CA, USA

9:20-9:25 am **eScience Café Break with Sponsored Videoclip**

Wednesday Parallel Session 15: Fundamentals of Microscale Separation Techniques

9:25 am **Session Introduction**
SESSION ORGANIZER AND CHAIR: Rob Haselberg, Assistant Professor, Division of BioAnalytical Chemistry, Vrije Universiteit Amsterdam, Amsterdam, THE NETHERLANDS

9:30 am (L-302) (KN) **Molecular Biophysics: Charge Interactions, CIEF and Affinity CE.**
Christin Scheller, Marc Hoffstedt, Ratih Hofstede, Finja Krebs, Holger Zagst, Robert Minkner, Matthias Stein, Hermann Wätzig, University of Braunschweig, Braunschweig, GERMANY

9:55 am (L-303) (YS) **Polyacrylamide Monoliths for Hydrophilic Interaction Chromatography Mass Spectrometry of Intact Proteins.** Marta Passamonti, Chiem de Roos, Marta Moreschini, Peter J. Schoenmakers, Andrea F. G. Gargano, University of Amsterdam, Amsterdam, THE NETHERLANDS

10:10 am (L-304) (YS) **Determination of NSAIDS by Capillary Electrophoresis with Capacitively Coupled Contactless Conductivity Detection in Wastewater.** Hanan Alatawi, Anna Hogan, Eric Moore, UCC-Analytical Chemistry, Cork, IRELAND

10:25 am (L-305) **Native Capillary Electrophoresis-Mass Spectrometry of the Near 1 MDa Non-covalent GroEL/GroES/Substrate Protein Complexes.** Anne-Lise Marie, Florian Georgescauld, Kendall Johnson, John R. Engen, Alexander R. Ivanov, Northeastern University, Boston, MA, USA

10:40-10:55 am (L-306) (YS) **Silylated Amino Acids as Hybrid Precursors for Protein-biomimetic Surface Coating: Application to Electrophoresis Separation.** Jérémie Gouyon, Catherine Perrin, Ladner Yoann, Institut des Biomolécules Max Mousseron (IBMM), UMR 5247-CNRS-UM-ENSCM, Université de Montpellier, Montpellier, FRANCE

Wednesday Parallel Session 16: Nanoproteomics Technologies

(Session sponsored by VICI)

9:25 am **Session Introduction**
SESSION ORGANIZER AND CHAIR: Yu Lu, Assistant Professor, Department of Biochemistry and Biomedical Sciences, McMaster University, Hamilton, Ontario, CANADA
CO-CHAIR: Jennifer Copeland, LC Product Manager, VICI, Houston, TX, USA

9:30 am (L-307) (KN) **Integrated Proteomics Sample Preparation for Nanoscale Interactome Profiling.** Ruijun Tian, Southern University of Science and Technology (SUSTech), Shenzhen, CHINA

9:55 am (L-308) **Highly Efficient Proteome and Phosphoproteome Capture and Analysis Procedure of Extracellular Vesicles from Urine and Plasma.** Anton Iliuk[1], Marco Hadisurya[2], Li Li[1], Xioafeng Wu[2], Shalini Padmanabhan[3], Andy Tao[2], [1]Tymora Analytical Operations, West Lafayette, IN, USA; [2]Purdue University, West Lafayette, IN, USA; [3]The Michael J. Fox Foundation, New York City, NY, USA

10:10 am (L-309) **Digital Microfluidics for Quantitative and Functional Low Cell Number Proteomics and Multi-omics.** Jan Leipert, Max Steinbach, Andreas Tholey, Kiel University, Dept. Proteomics and Bioanalytics, Kiel, GERMANY

10:25 am (L-310) **Quantification of TMPRSS2-ERG Protein Isoforms in Prostate Cancer by Orthogonal Immunoaffinity-targeted Proteomics Assays.** Zhiqiang Fu, Yasmine Rais, Andrei Drabovich, Department of Laboratory Medicine and Pathology, University of Alberta, Edmonton, CANADA

10:40-10:55 am (L-311) (YS) **High Sensitivity Proteomic Profiling of Limited Samples by Capillary Electrophoresis Coupled to Electrospray Ionization Mass Spectrometry.** Kendall Johnson, James C. Kostas, Alexander R. Ivanov, Barnett Institute of Chemical and Biological Analysis, Department of Chemistry and Chemical Biology, Northeastern University, Boston, MA, USA

10:55-11:00 am **eScience Café Break with Sponsored Videoclip**

Wednesday Parallel Session 17: Multidimensional Methods in Separations

11:00 am **Session Introduction**
SESSION ORGANIZER AND CHAIR: Andy High, Director, Research Operations, Center for Proteomics and Metabolomics, St. Jude Children's Research Hospital, Memphis, TN, USA

11:05 am (L-312) (KN) **Advanced Separation and Mass Spectrometry Methods to Characterize Host Cell Proteins in Biotherapeutics.** Christine Carapito, CNRS Strasbourg University, Strasbourg, FRANCE

11:30 am (L-313) (YS) **Peptide Mapping of Charge-based Separated Biotherapeutics by CZE-CZE-MS/MS.** Johannes Schlecht[1], Kevin Jooss[2], Bernd Moritz[3], Steffen Kiessig[4], Christian Neususess[1], [1]Aalen University, Aalen, GERMANY; [2]Northwestern University, Evanston, IL, USA; [3]F. Hoffmann-La Roche Ltd., Basel, SWITZERLAND; [4]Lonza AG, Basel, SWITZERLAND

11:45 am (L-314) (YS) **Charge-based Fractionation of Blood Plasma-derived Extracellular Vesicle Subpopulations for Proteomics Profiling.** Xianyi Su, Northeastern University, Boston, MA, USA

12:00 pm (L-315) (YS) **Deterministic iDEP Ratchet Devices for High-throughput Organelle Separation.** Domin Koh, Ricardo Ortiz, Mukul Sonker, Alexandra Ros, Center for Applied Structural Discovery (CASD), Tempe, AZ, USA

12:15-12:30 pm (L-316) (YS) **Top-down Proteomics of Complex Protein Samples using Online 2D High-pH/Low-pH Ultra High-pressure Nano-RPLC-MS.** Dahang Yu[1], Zhe Wang[1], Yanting Guo[1], Kellye Cupp-Sutton[1], Xiaowen Liu[2], Kenneth Smith[3], Si Wu[1], [1]University of Oklahoma, Norman, OK, USA; [2]Indiana University-Purdue University Indianapolis, Indianapolis, IA, USA; [3]Oklahoma Medical Research Foundation, Oklahoma City, OK, USA

Wednesday Parallel Session 18: Green Techniques for Microscale Sample Preparation and Analysis

11:00 am **Session Introduction**
SESSION ORGANIZER AND CHAIR: Jeongmi Lee, Associate Professor, School of Pharmacy, Sungkyunkwan University, Gyeonggi-do, REPUBLIC OF KOREA

11:05 am (L-317) (KN) **Minimization of Organic Solvent Use in Sample Preparation and Extraction.** Hian Kee Lee, National University of Singapore, Singapore, SINGAPORE

11:30 am (L-318) (YS) **A Simple and Green Microscale Sample Preparation Method for Antibiotics Analysis via in situ Formation of Hydrophobic Eutectic Solvents in Surface Water.** Ke Li, Jeongmi Lee, Yan Jin, Dasom Jung, Keunbae Park, Hireem Kim, Sungkyunkwan University, Suwon Gyeonggi-do, SOUTH KOREA

11:45 am (L-319) **Application of Novel Microsampling Approach based on SPME Probes for Monitoring Age- and Gender-related Alterations in the Level of Endocannabinoids in Brain Samples.** Anna Roszkowska[1], Ilona Klejbor[2], Joanna Bogusiewicz[3], Barbara Bojko[3], Janusz Moryś[2], Tomasz Bączek[1], [1]Department of Pharmaceutical Chemistry, Medical University of Gdańsk, Gdańsk, POLAND; [2]Department of Anatomy, Medical University of Gdańsk, Gdańsk, POLAND; [3]Department of Pharmacodynamics and Molecular Pharmacology Collegium Medicum Bydgoszcz, Nicolaus Copernicus University Toruń, Bydgoszcz, POLAND

12:00-12:15 pm (L-320) **Sample Preparation Carried out by 3D-printed Sorbents – Opportunities and Challenges in View of Miniaturization and Environmental Impact.** Mariusz Belka, Szymon Ulenberg, Paweł Georgiev, Dagmara Szynkiewicz, Tomasz Bączek, Medical University of Gdańsk, Gdansk, POLAND

12:30-12:35 pm **eScience Café Break with Sponsored Videoclip**

Wednesday Afternoon, July 14, 2021
Free eScience Café Seminar
sponsored by Bruker
12:35pm – 1:20pm

Wednesday Free eScience Café Seminar sponsored by BRUKER

Latest Applications of 4D-Proteomics using Trapped Ion Mobility on the timsTOF Pro 2

Presented by Gary Kruppa, Vice President Proteomics at Bruker Daltonics Inc., and Managing Director of Bruker S.R.O., Billerica, MA, USA

4D Proteomics – Dissecting the 3D Structure of Proteins through Ion Mobility Enhanced Crosslinking Mass Spectrometry

Presented by Richard Scheltema, Assistant Professor, Pharmaceutical Sciences, University of Utrecht, Utrecht, THE NETHERLANDS

Gary Kruppa, Ph.D. will present an update on the newly introduced timsTOF Pro 2 and the timsTOF SCP. The use of trapped ion mobility separation (TIMS) to enable Parallel Accumulation Serial Fragmentation for DDA PASEF will be explained. Then the principles and performance of the dia-PASEF and prm-PASEF methods will be covered. Updates on the latest exciting performance for ultra-high sensitivity and single cell proteomics will be shown. In the second half, Professor Richard Scheltema of the University of Utrecht will present results on ion mobility enhanced crosslinking mass spectrometry (caps-PASEF) to study the 3D structure of proteins. The use of the PhoX crosslinker which contains a phosphonate moiety that allows enrichment of species that react with the crosslinker will be introduced. The use of the caps-PASEF method to further focus on crosslinked species will be shown and applications to the study of proteins 3D protein structures will be discussed.

Wednesday Afternoon, July 14, 2021
Free eScience Café Seminar
sponsored by SCIEX
12:35pm – 1:20pm

Wednesday Free eScience Café Seminar sponsored by SCIEX

Comprehensive, 15-min Charge Variant Analysis of Biotherapeutics with a Microfluidic Chip-Based Integrated iCIEF-MS System

Presented by Maggie A. Ostrowski, Intabio, now part of SCIEX, Fremont, CA, USA

Charge heterogeneity analysis is essential for the successful development and production of therapeutic monoclonal antibodies (mAbs) in the biopharmaceutical industry. Charge heterogeneity of mAbs can result from cellular processes, chemical degradation, and production conditions during manufacturing. These changes can impact the therapeutic mAb's efficacy, safety and potency. As a result, the complex microheterogeneity of mAbs requires in-depth structural characterization for critical quality attribute (CQA) assessment. Capillary isoelectric focusing (cIEF) is a technique for separating charge variants where mAb modifications and degradation products affect the mAb's isoelectric point. cIEF has been widely adopted within the biopharmaceutical industry. However, when a change in a mAb is measured by cIEF, the process of identifying the post-translation modification that resulted in the change can be time-consuming and laborious, often requiring separation and fraction collection, followed by offline analysis by mass spectrometry. The integration of cIEF with MS results in a powerful analytical approach for more comprehensive and rapid mAb characterization. This presentation will summarize the development of our imaged cIEF-MS system designed specifically to enable full mass characterization of iCIEF peaks in a single 15-minute assay. The iCIEF separation, chemical mobilization and electrospray ionization (ESI) functions are integrated into a microfluidic chip, enabling automation of the workflow and direct interfacing with high-resolution QTOF systems for mass determinations and charge variant characterization. Several examples of charge variant characterization demonstrating high-resolution cIEF separation coupled with sensitive detection and mass identification of major and minor isoforms will be highlighted.

Wednesday Afternoon, July 14, 2021
Exhibits – Posters – Poster Pitches – Networking
1:20pm – 2:35pm

Networking and Building Connections
Vendor Booths in the Exhibit Hall
Poster Session and Poster Pitches in the Poster Hall

Wednesday Afternoon, July 14, 2021
Oral Presentations and Live Q&A
(time wise split in 2/3 talk and 1/3 discussion)
2:35pm – 6:25pm

Wednesday Award Session for Thermo Fisher Scientific Early Career Award for Breakthrough Research Advancing the Field of Microscale Separations and Bioanalysis Plenary Lecture 7

2:35 pm **Session Introduction**
Alexander Ivanov, Barnett Institute of Chemical and Biological Analysis, Northeastern University, Boston, MA, USA

2:40-3:15 pm (P-L-321) **Leveraging Capillary Electrophoresis-Mass Spectrometry for Multi-level Proteomics**
LIANGLIANG SUN, Assistant Professor, Department of Chemistry, Michigan State University, East Lansing, MI, USA

Wednesday Parallel Session 19: Single-Particle Assays: Single Molecules to Single Cells

3:15 pm **Session Introduction**
SESSION ORGANIZER AND CHAIR: Stephen C. Jacobson, Professor, Dorothy and Edward Bair Chair, Department of Chemistry, Indiana University, Bloomington, IN, USA

3:20 pm (L-322) (KN) **A Single Cell Mechanical Assay on a Chip.** Noritada Kaji, Kyushu University, Fukuoka, JAPAN

3:45 pm (L-323) **Stiffness of Single Apoptotic Bodies to Inform Brain Cancer Therapeutics.** Joanna Dahl[1], Miho Jeong[2], Hyungsoon Im[2], [1]Engineering Department, University of Massachusetts Boston, Boston, MA, USA; [2]Center for Systems Biology, Massachusetts General Hospital, Boston, MA, USA

4:00 pm (L-324) (YS) **Increasing the Purity of Extracellular Vesicle Isolation from Blood Plasma using Multi-mode Chromatography Techniques.** Alan Zimmerman[1], Xianyi Su[1], Getulio Pereira de Oliveira Jr.[2], Jacqueline Wood[1], Zhengxin Fu[1], Brandy Pickney[3], John Tigges[3], Ionita Ghiran[2], Alexander R. Ivanov[1], [1]Barnett Institute of Chemical and Biological Analysis, Northeastern University, Boston, MA, USA; [2]Division of Allergy and Inflammation, Department of Medicine, Beth Israel Deaconess Medical Center, Boston, MA, USA; [3]Nano Flow Core Facility, Beth Israel Deaconess Medical Center, Boston, MA, USA

4:15 pm (L-325) (YS) **Microfluidic Fractionation: A New Approach to Study Heterogeneous Yeast Cultures.** Sebastian Schwaminger[1], Leonie Wittmann[2], [1]Massachusetts Institute of Technology, Cambridge, MA, USA; [2]Technical University of Munich, Garching, GERMANY

4:30-4:45 pm (L-341) **Size-Exclusion Chromatography Shows that Lipid Nanoparticles Acquire Lipoproteins from HDL.** Debora Roaquin, Nabeel Nissar, Joe Sarkis, Rositsa Koleva, Moderna, Cambridge, MA, USA

Wednesday Parallel Session 20: Innovation in Microfluidics, Point-of-care Devices, Precision Medicine

3:15 pm **Session Introduction**
SESSION ORGANIZER AND CHAIR: Takehiko Kitamori, Yushan Honorary Chair Professor, Institute of Nanoengineering and Microsystems iNEMS, Department of Power Mechanical Engineering, National Tsing Hua University, Hsinchu City, TAIWAN

3:20 pm (L-326) (KN) **IL-6 Diagnostic Device for COVID-19 and Its Clinical Validations.** Chao-Min Cheng, National Tsing Hua University, Hsinchu, TAIWAN

3:45 pm (L-327) (YS) **Ultrasensitive and Label-free Fluorescent Nanobiosensor for the Detection of miRNA in Breast Cancer Progression.** Zheng Wei Wong, Siu Yee New, University of Nottingham Malaysia, Semenyih, MALAYSIA

4:00 pm (L-328) **Automation of Solid Phase Extraction for Peptide Desalting by Centrifugal Microfluidics.** Jan-Niklas Klatt[1], Thien-Ly Julia Dinh[2], Roland Zengerle[1], Frank Schmidt[3], Nils Paust[4], Oliver Schilling[2], Tobias Hutzenlaub[4], [1]Laboratory for MEMS Applications IMTEK, Department of Microsystems Engineering, University of Freiburg, Freiburg, GERMANY; [2]Institute for Surgical Pathology Medical Center, University of Freiburg, Freiburg, GERMANY; [3]Weill Cornell Medicine, Qatar, Doha, QATAR; [4]Hahn-Schickard, Freiburg, GERMANY

4:15 pm (L-329) **Quantification of Metalloprotein Biomarkers in Human Blood Plasma.** Kerri Miller, Juergen Gailer, University of Calgary, Calgary, CANADA

4:30-4:45 pm (L-330) **Epitachophoresis – Theoretical and Practical Considerations.** Frantisek Foret[1], Ivona Voracova[1], Jan Prikryl[1], Bohuslav Gas[2], Vladimira Datinska[3], Yann Astier[3], Gheibi Pantea[3], Jakub Novotny[1], [1]Institute of Analytical Chemistry, Brno, CZECH REPUBLIC; [2]Charles University, Prague, CZECH REPUBLIC; [3]Roche Inc., Pleasanton, CA, USA

4:45-4:55 pm **eScience Café Break with Sponsored Videoclip**

Wednesday Parallel Session 21: Advancements in Miniaturized Sample Preparation Techniques

4:55 pm **Session Introduction**
SESSION ORGANIZER AND CHAIR: Ryan T. Kelly, Associate Professor, Department of Chemistry and Biochemistry, Brigham Young University, Provo, UT, USA

5:00 pm (L-331) (KN) **Droplet Sample Preparation for Single-cell Proteomics Applied to the Cell Cycle.** Nikolai Slavov, Bioengineering Department, Barnett Institute, Cambridge, MA, USA

5:25 pm (L-332) **Advanced 3D Printing for Microfluidics.** Gregory Nordin, Adam Woolley, Brigham Young University, Provo, UT, USA

5:40 pm (L-333) **Ultrasensitive Top-down Proteomics based on a Nanodroplet Sample Processing Platform.** Mowei Zhou[1], Yen-Chen Liao[1], Naomi Uwugiaren[2], Sarah Williams[1], Dusan Velickovic[1], Ryan Sontag[1], Ronald Moore[1], Rui Zhao[1], David Goodlett[3], Irena Dapic[2], Ljiljana Paša-Tolić[1], Ying Zhu[1], [1]Pacific Northwest National Laboratory, Richland, WA, USA; [2]University of Gdansk, Gdansk, POLAND; [3]University of Maryland, Baltimore, MD, USA

5:55 pm (L-334) (YS) **A Capillary Flow-based Sample Preparation System for Metabolomic Sample Preparation of Mammalian Cells in Suspension.** John Coulton, Jim Edwards, Saint Louis University, St. Louis, MO, USA

6:10-6:25 pm (L-335) **Development of New Disposable Pipette Extraction Sorbents for Clinical Purposes.** Andrea Chaves, Rafael Martins, Lucas Machado, Ricardo Bernardo, Heloá Santos, Izadora Gomes, Aline Fernandes, Boniek Vaz, Amanda Bueno, Universidade Federal de Goiás, Goiânia, BRAZIL

Wednesday Parallel Session 22: Novel and Advanced Approaches and Hardware Solutions for Enabling Microscale Bioseparations and Microanalysis

4:55 pm **Session Introduction**
SESSION ORGANIZER AND CHAIR: Frantisek Foret, Director of the Institute of Analytical Chemistry, Brno, CZECH REPUBLIC

5:00 pm (L-336) (KN) **Multimodal Imaging of 3D Cell Aggregates.** Jan Preisler[1], Markéta Machalkova[1], Barbora Pavlatovska[1], Jarmila Navratilova[1], Marek Stiborek[1], Stanislava Meliorisova[1], Jiří Kroupa[2], Pavel Houska[2], Jan Michalek[1], Karel Stepka[1], Katarzyna Anna Radaszkiewicz[1], Adam Pruska[1], Viktor Kanicky[1], Michal Kozube[1], Jan Smarda[1], [1]Masaryk University, Brno, CZECH REPUBLIC; [2]University of Technology, Brno, CZECH REPUBLIC

5:25 pm (L-337) (YS) **Development of a Micro-LC-MS/MS Method for Quantitative Analysis of Endocannabinoids and Related N-acylethanolamines in Human Cerebrospinal Fluid.** Bingshu He[1], Xinyu Di[1], Faisa Guled[1], Aster Harder[2], Arn Maagdenberg[2], Gisela Terwindt[2], Amy Harms[1], Rawi Ramautar[1], Thomas Hankemeier[1], [1]Division of Systems Biomedicine and Pharmacology, Leiden Academic Centre for Drug Research, Leiden University, Leiden, THE NETHERLANDS;[2]Departments of Neurology and Human Genetics, Leiden University Medical Center, Leiden University, Leiden, THE NETHERLANDS

5:40 pm (L-338) (YS) **High Throughput Analysis and Ultra-small Volume Detection of Biological Samples using Droplet Imbibition Mass Spectrometry.** Taghi Sahraeian, Abraham Badu-Tawiah, The Ohio State University, Columbus, OH, USA

5:55 pm (L-339) **A 3-D Printed Sheath Flow Cuvette for Capillary Array Detection.** Cameron Skinner, Concordia University, Montreal, Quebec, CANADA

6:10-6:25 pm (L-340) (YS) **High-resolution 3D-printed Insulator-based Dielectrophoresis Devices Towards Manipulation of Bioanalytes.** Mukul Sonker, Mohammad Towshif Rabbani, Jorvani Cruz Villarreal, Alexandra Ros, School of Molecular Sciences, Arizona State University, Tempe, AZ, USA

Thursday Morning, July 15, 2021
Oral Presentations and Live Q&A
(time wise split in 2/3 talk and 1/3 discussion)
8:40am – 12:30pm

Thursday Plenary Lecture 8

8:40 am **Session Introduction**
Kimberly Hamad-Schifferli, University of Massachusetts Boston, Boston, MA, USA

8:45-9:20 am (P-L-401) **Microfluidic Sorting of Extremely Rare Circulating Tumor Cells and Clusters from Blood**
MEHMET TONER, Helen Andrus Benedict Professor of Biomedical Engineering, Co-Director, Center for Engineering in Medicine and Surgery, Massachusetts General Hospital and Harvard Medical School, Harvard-MIT Health Sciences and Technology, Boston, MA, USA

9:20-9:25 am **eScience Café Break with Sponsored Videoclip**

Thursday Parallel Session 23: Novel Informatics and Software Approaches for Enabling Bioseparations and Microanalysis

9:25 am **Session Introduction**
SESSION ORGANIZER AND CHAIR: Oleg V. Krokhin, Associate Professor, Department of Internal Medicine, University of Manitoba, Winnipeg, MB, CANADA
SESSION CO-CHAIR: Darien Yeung, Manitoba Centre for Proteomics and Systems Biology, Winnipeg, CANADA

9:30 am (L-402) (KN) **Bioinformatic Methods to Leverage High Quality Retention Time Libraries in Proteomics.** Brian C. Searle, The Ohio State University, Columbus, OH, USA

9:55 am (L-403) (YS) **Unique Computational Perspectives of Terminal Residue Effects on Peptide Retention Properties.** Darien Yeung, Victor Spicer, Oleg Krokhin, Manitoba Centre for Proteomics and Systems Biology, Winnipeg, CANADA

10:10 am (L-404) (YS) **MS-based Molecular Networking Strategy for Drug Metabolite Identification: In Case of Sildenafil In Vitro Metabolism Study.** Jun Sang Yu[1], Hye Hyun Yoo[1], Kyo Bin Kang[2], [1]Hanyang University, Ansan, SOUTH KOREA; [2]Sookmyung Women's University, Seoul, SOUTH KOREA

10:25 am (L-405) (YS) **A New Open-source and User-friendly Tool for Accurate and Automated Baseline Correction in Capillary Electrophoresis.** Tijmen S. Bos, Martijn Knoope, Rob Haselberg, Govert W. Somsen, Division of Bioanalytical Chemistry, Amsterdam Institute for Molecular and Life Sciences, Vrije Universiteit Amsterdam, Amsterdam, THE NETHERLANDS

10:40-10:55 am (L-406) (YS) **Development of Data Analysis and Software Approaches to Improve the Sensitivity of Mass Spectrometry-based Thermal Shift Assays (MS-TSA) for Target Engagement and Drug Discovery.** Amanda Figueroa-Navedo[1], Clifford Phaneuf[2], Harvey Lieberman[3], Alla Kloss[3], Alexander Ivanov[4], [1]Department of Chemistry and Chemical Biology, Barnett Institute of Chemical and Biological Analysis, Northeastern University, Boston, MA, USA; [2]Analytical Research and Development, Sanofi, Cambridge, MA, USA; [3]Analytical Research and Development, Sanofi, Waltham, MA, USA; [4]Department of Chemistry and Chemical Biology, Barnett Institute of Chemical and Biological Analysis, Northeastern University, Bayamon, PR, USA

Thursday Parallel Session 24: Micro-Analytical Systems for Point-of-Care Disease Diagnosis

9:25 am **Session Introduction**
SESSION ORGANIZER AND CHAIR: Abraham Badu-Tawiah, Associate Professor, Chemistry and Biochemistry, The Ohio State University, Columbus, OH, USA

9:30 am (L-407) (KN) **Flow-through Sensors for Chemical and Biochemical Analysis in the Field.** Dionysios Christodouleas, Ana Maria Routsi, Orestis Grammenos, Abbas Kazi, Department of Chemistry, University of Massachusetts Lowell, Lowell, MA, USA

9:55 am (L-408) **Quantitative Analysis of Virus Like Particle Separation using Insulator-based Gradient Dielectrophoresis.** David Charlot, Alex Ramirez, Mark Hayes, Brenda Hogue, Matt McFadden, Bereket Estifanos, Pete Dawson, Anna Vu, Arizona State University, Tempe, AZ, USA

10:10 am (L-409) **Open-source Mass Spectrometry for Clinical Applications.** Suji Lee, Dmytro Kulyk, Kavyasree Chintalapudi, Abraham Badu-Tawiah, Ohio State University, Columbus, OH, USA

10:25 am (L-410) (YS) **Large-scale Top-down Proteomics of Human Colorectal Cancer Cell Lines using Capillary Zone Electrophoresis-Tandem Mass Spectrometry.** Elijah McCool, Liangliang Sun, Michigan State University, East Lansing, MI, USA

10:40-10:55 am (L-411) **Thermal Denaturation Proteolysis for Viral Capsid Protein Structural Analysis.** Estee Toole[1], Craig Dufresne[1], Alexander Schwahn[2], Somak Ray[3], Ken Cook[4], Alexander Ivanov[3], [1]Thermo Fisher Scientific, West Palm Beach, FL, USA; [2]Thermo Fisher Scientific, Reinach, SWITZERLAND; [3]Northeastern University, Boston, MA, USA; [4]Thermo Fisher Scientific, Hemel, Hempstead, UK

10:55-11:00 am **eScience Café Break with Sponsored Videoclip**

Thursday Parallel Session 25: Glycomic and (Glyco)Proteomic Applications to Address Unsolved Biomedical Question

11:00 am **Session Introduction**
SESSION ORGANIZER AND CHAIR: Guinevere S.M. Lagveen-Kammeijer, Post-doctoral Researcher, Center for Proteomics and Metabolomics, Leiden University Medical Center, Leiden, THE NETHERLANDS

11:05 am (L-412) (KN) **Multi-glycomics Discovery.** Nicolle Packer, Department of Molecular Sciences, Macquarie University, Sydney, AUSTRALIA

11:30 am (L-413) (YS) **Monolith O-glycosidase Microreactor for Efficient O-glycan Release.** Bin Yang[1], Thuy N. Tran[1], Zhengjin Jiang[2], Myriam Taverna[3], [1]Université Paris-Saclay CNRS Institut Galien Paris Saclay, Paris, FRANCE; [2]Institute of Pharmaceutical Analysis, College of Pharmacy, Jinan University, Guangzhou, CHINA; [3]Université Paris-Saclay CNRS, Institut Galien Paris Saclay; Institut Universitaire de France (IUF), Paris, FRANCE

11:45 am (L-414) (YS) **Alterations in Protein Expression and Site-specific N-glycosylation of Prostate Cancer Tissues.** Simon Sugár, Gábor Tóth, Fanni Bugyi, Károly Vékey, László Drahos, Lilla Turiák, MS Proteomics Research Group Research, Centre for Natural Sciences, Eötvös Loránd Research Network, Budapest, HUNGARY

12:00 pm (L-415) (YS) **Combined PGC LC-MS/MS and mRNA Expression Analyses in AML Cells Delineates Differential GSL-Glycan Signatures.** Di Wang[1], Tao Zhang[1], Guinevere S. M. Lageveen-Kammeijer[1], Katarina Madunic[1], Oleg A. Mayboroda[1], Marieke Griffioen[1], Robbert M. Spaapen[2], Manfred Wuhrer[1], [1]Leiden University Medical Center, Leiden, THE NETHERLANDS; [2]Sanquin, Amsterdam, THE NETHERLANDS

12:15-12:30 pm (L-416) (YS) **Dopant-enriched Nitrogen Gas for Enhanced Electrospray Ionization of Released Glycans in Negative Ion Mode.** Katarina Madunic[1], Sander Wagt[2], Tao Zhang[2], Manfred Wuhrer[2], Guinevere S. M Lageveen-Kammeijer[2], [1]Leiden University Medical Center, Leiden, THE NETHERLANDS; [2]Leiden University Medical Center, Leiden, THE NETHERLANDS

Thursday Parallel Session 26: Biosensors and Actuators: Instruments, Components and Applications

11:00 am **Session Introduction**
SESSION ORGANIZER AND CHAIR: Vincent Remcho, Professor, Department of Chemistry and Materials Sciences, Oregon State University, Corvallis, OR, USA

11:05 am (L-417) (KN) **3D Printing as a Powerful Tool for the Production of Low-cost Microfluidic Devices.** José Alberto Fracassi Da Silva, Department of Analytical Chemistry, Chemistry Institute, State University of Campinas, UNICAMP, Campinas, Sao Paulo, BRAZIL

11:30 am (L-418) (YS) **Fabrication of Hydrogels for the Recognition of Specified Proteins via Grafting Molecularly Imprinted Polymers.** Chenchen Liu, Takuya Kubo, Koji Otsuka, Graduate School of Engineering, Kyoto University, Kyoto, JAPAN

11:45 am (L-419) (YS) **Novel Strategies for Elucidation of the Interaction between Functionalized Magnetic Beads and Pharmaceutical and Diagnostic Molecules.** Ngoc-Van-Thanh Nguyen[1], Duc-Thanh Mai[1], Claire Smadja[1], Jean-Michel Siaugue[2], Myriam Taverna[3], [1]Institut Galien Paris-Saclay, Chatenay-Malabry, FRANCE; [2]University Sorbonne, Paris, FRANCE; [3]Institut Galien Paris-Saclay, Institut Universitaire de France, Paris, FRANCE

12:00 pm (L-420) (YS) **Nucleic Acid Amplification using Radio Frequency Electrokinetic Heating.** Jarad Yost, Zachary Gagnon, Texas A&M University, College Station, TX, USA

12:15-12:30 pm (L-421) **Nitrogen-doped Carbon Dots Aid Electrokinetic Separations of ssDNA Molecules.** Debashish Roy, Christa Colyer, Wake Forest University, Winston-Salem, NC, USA

12:30-12:35 pm **eScience Café Break with Sponsored Videoclip**

Thursday Afternoon, July 15, 2021
Free eScience Café Seminar
sponsored by Agilent
12:35pm – 1:20pm

Thursday Free eScience Café Seminar sponsored by AGILENT

Advancing Denaturing and Native Top-down Proteomics Analysis using CE-MS

Presented by Liangliang Sun, Assistant Professor, Department of Chemistry, Michigan State University, East Lansing, MI, USA

Studying the function of proteins in cells is vital for understanding the underlying molecular mechanisms of disease and development. Posttranslational modifications (PTMs) can influence protein conformations and function. Understanding protein function requires a deeper characterization of proteoforms and their associated protein complexes. Top-down proteomics (TDP) aims to delineate proteoforms and protein complexes on a global scale and in discovery mode. It has achieved substantial progress in the last decade. However, many challenges remain, including but not limited to high-capacity separation and extensive fragmentation of proteoforms and protein complexes. In this talk, we will introduce capillary electrophoresis-mass spectrometry as a useful tool for highly efficient and high-capacity separation of proteoforms and protein complexes as well as the combination of electron capture dissociation and collision-induced dissociation as a powerful technique for nearly 100% backbone cleavage of proteins smaller than 30 kDa. We employed an Agilent G1700 Capillary Electrophoresis with CMP EMass II interface, 6545XT Q-TOF mass spectrometer and eMSion ECD cell in these studies.

Thursday Afternoon, July 15, 2021
Exhibits – Posters – Poster Pitches – Networking
1:20pm – 2:35pm

Networking and Building Connections
Vendor Booths in the Exhibit Hall
Poster Session and Poster Pitches in the Poster Hall

Thursday Afternoon, July 15, 2021
Oral Presentations and Live Q&A
(time wise split in 2/3 talk and 1/3 discussion)
2:35pm – 5:30pm

Thursday Plenary Lecture 9

2:35 pm **Session Introduction**
Jarrod Marto, Dana-Farber Cancer Institute, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA

2:40-3:15 pm (P-L-422) **Toward Universal Druggability**
GREGORY VERDINE, President and Chief Executive Officer, FogPharma, Cambridge, MA, USA

Thursday Parallel Session 27: Celebrating the Greater Boston and Massachusetts Life Science Industry

3:15 pm **Session Introduction**
SESSION ORGANIZER AND CHAIR: Paola Castaldi, Vice President of Chemical Biology and Proteomics, LifeMine Therapeutics, Cambridge, MA, USA *(Industrial Advisory Committee Chair)*

3:25 pm (L-423) **Experimental Strategies to Improve Target Identification in Mass Spectrometry-based Thermal Stability Assays.** Clifford Phaneuf[1], Amanda Figueroa-Navedo[2], Alexander Ivanov[2], Konstantin Ayzikov[3], [1]Sanofi, Cambridge, MA, USA; [2]Northeastern University, Boston, MA, USA; [3]Thermo Fisher Scientific, Bremen, GERMANY

3:40 pm (L-424) **Complementary Chemoproteomic Workflows: Applications of Chemoproteomics in Target Identification and Drug Discovery.** Francisco Garcia, Mike Jones, Jennifer Lipps, Lynn McGregor, Jason Murphy, Claude Shelton, Jason Thomas, Markus Schirle, Scott Brittain, Novartis Institutes for BioMedical Research, Cambridge, MA, USA

3:55 pm (L-425) **Development of a Novel Automated, High-Throughput, Plasma Protein Biomarker Enrichment Protocol.** Patrick McCarthy[1], Jason Evans[2], Rachel Muriph[2], Ulrich Thomann[1], [1]Covaris Inc., Woburn, MA, USA; [2]University of Massachusetts Boston, Boston, MA, USA

4:10-4:25 pm (L-426) **Development of a Broad Spectrum, Vinyl Sulfonate-based Activity-based Probe for SHP2.** Wankyu Lee[1], Christopher am Ende[2], Uthpala Seneviratne[3], [1]Dewpoint Therapeutics, Boston, MA, USA; [2]Pfizer, Groton, CT, USA; [3]Pfizer, Cambridge, MA, USA

Thursday Parallel Session 28: Additional Young Scientists Orals in Competition for the 2021 MSB Young Scientist Award

(Session sponsored by Dana-Farber Cancer Institute)

3:20 pm **Session Introduction**

3:25 pm (L-427) (YS) **Rapid In-gel Protein Detection from Highly-integrated Single-cell Immunoassays by Electrotransfer Probing.** Andoni Mourdoukoutas, Amy Herr, University of California Berkeley, Bioengineering, Berkeley, CA, USA

3:40 pm (L-428) (YS) **Droplet Microfluidic Technology for the Early and Label-free Isolation of Activated T-cells.** Claudia Zielke, Adriana Gutierrez Ramirez, Paul Abbyad, Santa Clara University, Santa Clara, CA, USA

3:55 pm (L-429) (YS) **Novel Water-compatible Type of Stationary Phase for Thin-film Microextraction (TFME) of Small Molecules from Aqueous Samples.** Lukasz Sobczak, Dominika Kołodziej, Krzysztof Goryński, Nicolaus Copernicus University Toruń, Bydgoszcz, POLAND

4:10-4:25 pm (L-430) (YS) **Isotope Encoded Derivatization of Endothelial Cell Lysates for Nine-plex Quantitation of Aldehyde Metabolites using nESI-LC-HRMS.** Michael Armbruster, Scott Grady, Julius Agongo, Chris Arnatt, James Edwards, Saint Louis University, St. Louis, MO, USA

4:25-4:40 pm **eScience Café Break with Sponsored Videoclip**

Thursday Awards Session and Final Remarks

4:40-4:50 pm **Presentation of Young Scientist (YS) Oral Presentation Award**

4:50-5:00 pm **Presentation of Best Poster Awards**

5:00-5:10 pm **Invitation to MSB 2022 – April 3-6, 2022 in Liege, Belgium**
Heidi Ottevaere, Vrije Universiteit Brussel, Brussels Photonics, BELGIUM

5:10-5:30 pm **Closing Session and Final Remarks**

Young Scientist Award

The MSB Young Scientist Award is intended to give talented young scientists extra encouragement. It is presented annually during the MSB symposium to a young researcher whose outstanding work sets an example for other scientists. All presenters of an oral contribution who are less than 35 years of age at the end date of the meeting are eligible for consideration (proof of status as student or postdoctoral fellow will be required). An international jury of both young and mature scientists judge the qualified presentations and choose a winner.

Best Poster Awards

All posters presented at MSB 2021 will be considered in competition for an MSB 2021 Poster Award. The posters will be reviewed by an international panel of scientists and ranked based on novelty and originality of the work, creativity and potential for innovation; scope of work, technical quality of experimental design, and execution of experiments; readability of the presentation and author's explanations. Poster awards comprise cash prizes and book vouchers. Winners will be announced and the prizes awarded during the Awards Session/Closing Ceremony.

e-MSB 2021 BOSTON

CONTINUE TO POSTER PRESENTATIONS →

MSB 2021 Poster Presentations

(P-001) **Peptide Mapping Employing Pepsin and Triethoxysilylbutyraldehyde: Optimizing the Immobilization Parameters via Capillary Electrophoresis and Mass Spectrometric Analysis.** Connor Frey, Kenneth Ku, Maor Arad, Golfam Ghafourifar, University of the Fraser Valley, Abbotsford, CANADA

(P-002) **Use of Micellar Liquid Chromatography to Determine Mebendazole in Dairy Products and Breeding Waste from Bovine Animals.** Samuel Carda-Broch[1], Juan Peris-Vicente[2], Jaume Albiol-Chiva[1], Daniel García-Ferrer[2], Enrique Ochoa-Aranda[3], Devasish Bose[4], Abhilasha Durgbanshi[4], [1]Universitat Jaume I, Castelló, SPAIN; [2]Universitat de Valencia, Valencia, SPAIN; [3]Hospital Provincial de Castelló, Castelló, SPAIN; [4]Doctor Harisingh Gour Vishwavidyalaya (A Central University), Sagar, INDIA

(P-003) **Determination of Rivaroxaban in Pharmaceutical Formulations by Micellar Liquid Chromatography.** Samuel Carda-Boch[1], Jaume Albiol-Chiva[1], Juan Peris-Vicente[2], Rebeca Salvador Sáez[1], Daniel García-Ferrer[2], María-Angeles Goberna-Bravo[2], Pasqual Roca-Genovés[1], Aurelio García-García[3], [1]Universitat Jaume I, Castello, SPAIN; [2]Universitat de Valencia, Burjassot-Valencia, SPAIN; [3]Hospital General Universitario de Castellón, Castello, SPAIN

(P-004) **Paper-based Aluminum-air Battery with 3D-printed Housing.** Emmanuel Ramirez, Frank Gomez, California State University Los Angeles, Los Angeles, CA, USA

(P-005) **Potential of hemaPEN® Microsampling Devices to Monitor Training Load and Health of Sport Practitioners Using a Targeted Metabolomics Approach.** Cindy Nix, Maryam Hemmati, Gaël Cobraiville, Anne-Catherine Servais, Marianne Fillet, Laboratory for the Analysis of Medicines, University of Liege, Liege, BELGIUM

(P-006) **Comparison of (3-Aminopropyl)triethoxysilane and Triethoxysilylbutyraldehyde for the In-situ Fabrication of Capillary-based Microfluidic Immobilized Enzyme Reactor (μIMER) Employing Chymotrypsin.** Kenneth Ku, Connor Frey, Golfam Ghafourifar, University of the Fraser Valley, Abbotsford, CANADA

(P-007) **Targeted Profiling of Short-, Medium-, and Long-chain Fatty Acyl-coenzyme as in Biological Samples by Phosphate Methylation Coupled to Liquid Chromatography–Tandem Mass Spectrometry.** Peng Li, Michael Laemmerhofer, University of Tuebingen, Tuebingen, GERMANY

(P-008) **Reversed-phase Capillary Electrochromatography of Precolumn Derivatized Mono- and Oligosaccharides with Three Different UV Absorbing and Fluorescent Derivatizing Agents.** Vaithilingam Rajendiran, Ziad El Rassi, Oklahoma State University, Stillwater, OK, USA

(P-009) **Multiplexed nano-LC System for High-throughput Single-cell Proteomics.** Kei Webber[1], Sebastian Zapata[1], Jacob Davis[1], Thy Truong[1], Fletcher Smith[1], Alex Buttars[1], Madi Johnston[1], Richard Carson[1], Ying Zhu[2], Greg Nordin[1], Ryan Kelly[1], [1]Brigham Young University, Provo, UT, USA; [2]Pacific Northwest National Laboratory, Richland, WA, USA

(P-010) **Post Polymerization Functionalization of Carboxy Precursor Monolithic Columns with Octadecyl and Anthracenyl Ligands for Use in Reversed-phase Capillary Electrochromatography.** Theophilus Neequaye, Ziad El Rassi, Oklahoma State University, Stillwater, OK, USA

(P-011) **An Eco-friendly Method based on Deep Eutectic Solvents to Prepare Chitin-glucan Complexes from White-button Mushroom.** Hireem Kim, Seulgi Kang, Ke Li, Dasom Jung, Keunbae Park, Jeongmi Lee, Sungkyunkwan University, Suwon, SOUTH KOREA

(P-012) **Efficient Phosphoproteomic Workflow for the Analysis of FFPE Tissue Sections.** Fanni Bugyi[1], Gábor Tóth[1], Kinga Kovács[2], András Balla[2], László Nyitray[3], László Drahos[1], Lilla Turiák[1], [1]MS Proteomics Research Group Research Centre for Natural Sciences, Budapest, HUNGARY; [2]Semmelweis University, Budapest, HUNGARY; [3]Eötvös Loránd University, Budapest, HUNGARY

MSB 2021 Poster Presentations

(P-013) **Multiple Myeloma Cells Surface Proteome Analysis using LC-Chip Coupled with IM-QTOF: Optimization of Cell Surface Proteins Isolation Procedure.** Marie-Jia Gou[1], Gael Cobraiville[1], Jo Caers[2], Marianne Fillet[1], [1]Laboratory for the Analysis of Medicines, University of Liege, Liege, BELGIUM; [2]University Hospital of Liege Liege, BELGIUM

(P-014) **Glass-microfiber based Biodosimeter for Space-Flight Quantitation of miRNA-150: Approaches in Bioassay Development.** Michelle Tran, Vincent Remcho, Oregon State University, Corvallis, Oregon, USA

(P-015) **Structures for Lossless Ion Manipulation-MS for High Resolution, High Throughput Lipid Biomarker Analysis.** Kelly Moser[1], James Arndt[1], Liulin Deng[1], Anisha Yadav[1], Daniel DeBord[1], Laura Maxon[1], Kim Ekroos[2], [1]MOBILion Systems Inc., Chadds Ford, PA, USA; [2]Lipidomics Consulting Ltd., Esbo, FINLAND

(P-016) **Practical High Resolution Ion Mobility Mass Spectrometry Analysis with Structures for Lossless Ion Manipulations.** Daniel DeBord, Kelly Moser, James Arndt, Nathan Roehr, Liulin Deng, MOBILion Systems, Inc., Chadds Ford, PA, USA

(P-017) **Biotherapeutic Characterization in Fifteen Minutes: Structures for Lossless Ion Manipulations (SLIM) Ion Mobility for Critical Quality Attribute Identification and Monitoring.** James Arndt, Steven Broome, Kelly Moser, Liulin Deng, Anisha Yadav, Daniel DeBord, Laura Maxon, MOBILion Systems, Inc., Chadds Ford, PA, USA

(P-018) **Low pg Level Protein Detection in Cell Lysates.** Thomas Kosinski[1], Amali Apalategui[1], Oliver Raether[1], Markus Lubeck[1], Gary Kruppa[2], Matthew Willetts[3], Nagarjuna Nagaraj[4], [1]Bruker, Bremen, GERMANY; [2]Bruker, Prague, CZECH REPUBLIC; [3]Bruker, Bremen, MA, USA; [4]Bruker, Bremen, GERMANY

(P-019) **Real-time Search of Ubiquitin diGLY Modified Peptides and PaSER Acquisition Control.** Christopher Adams[1], Robin Park[1], Matthew Willetts[2], Elizabeth Gordon[2], Barry Zee[3], Haley Peckham[3], Tharan Srikumar[4], [1]Bruker, San Jose, CA, USA; [2]Bruker, Billerica, MA, USA; [3]Cell Signalling Technology, Danvers, MA, USA; [4]Bruker, Milton, CANADA

(P-020) **Microfluidic Assay for In Situ Mass Spectrometry Analysis of Immunocaptured Amyloid-beta from Microdissected Human Brain Cells.** Jorvani Cruz Villarreal[1], Ana Egatz-Gomez[1], George T. Noutsios[2], Todd R. Sandrin[2], Paul D. Coleman[3], Alexandra Ros[1], [1]School of Molecular Science and The Biodesign Institute, Arizona State University, Tempe, AZ, USA; [2]School of Mathematical and Natural Sciences and Julie Ann Wrigley Global Institute of Sustainability, Arizona State University, Tempe, AZ, USA; [3]Banner ASU Neurodegenerative Research Center, The Biodesign Institute, Arizona State University, Tempe, AZ, USA

(P-021) **Large Volume Sample Stacking-Capillary Electrophoresis for High Sensitivity Detection of Nisin.** Lauren Okano[1], Cyrene Catenza[2], Dr. Kingsley Donkor[1], [1]Thompson Rivers University, Kamloops, CANADA; [2]University of Alberta, Edmonton, CANADA

(P-022) **Development of a Quantitative Method for Assessment of DNA Nanostructure Stability in Human Serum by Size Exclusion Chromatography.** Nicole Langlois, Taylor Lynch, Heather Clark, Northeastern University, Boston, MA, USA

(P-023) **Preconcentration of DNA in A 3D-Printed Microfluidic Device.** Jan Petr, Soodabeh Hassanpour, Palacky University Olomouc, Olomouc, CZECH REPUBLIC

(P-024) **Capillary Isoelectric Focusing-Tandem Mass Spectrometry for Large-Scale Top-Down Proteomics.** Tian Xu, Liangliang Sun, Department of Chemistry, Michigan State University, East Lansing, MI, USA

MSB 2021 Poster Presentations

(P-025) **Synthesis, Enantioseparation and Absolute Configuration Assignment of Iminoflavans by Chiral HPLC Combined With On-Line Chiroptical Detection.** Mohamed Ndjib Rebizi, Organic Chemistry and Natural Substances Laboratory, University of Zian Achor, Djelfa, ALGERIA

(P-026) **A Novel Investigation on Piezoelectric-based Flow Measurement in Microfluidic Devices.** Armin Sedighi[1], Alireza Shamsi[2], [1]Islamic Azad University Science and Research Branch, Tehran IRAN; [2]Mapna Operation and Maintenance Co., Tehran IRAN

(P-027) **A Method for Selectively Deconvoluting the Structure and Composition of Natural Nanostructured Granules in Squid Chromatophore Organs.** Duncan Bower, Sue Abbatiello, Leila Deravi, Northeastern University, Boston, MA, USA

(P-028) **Top-down Proteomics of Phosphoproteins by Microparticle-based Enrichment and Capillary Zone Electrophoresis-Mass Spectrometry.** Qianyi Wang, Liangliang Sun, Michigan State University, East Lansing, MI, USA

(P-029) **Improving Sensitivity for Single Cell Analysis using <20 µm i.d packed NanoLC Columns.** Thy Truong, Brigham Young University, Provo, Utah, USA

(P-030) **JUMPn: A Streamlined Application for Co-Expression Clustering and Protein Interaction Network Analysis in Quantitative Proteomics.** David Vanderwall, Ji-Hoon Cho, Poudel Suresh, Timothy Shaw, Ashutosh Mishra, Anthony High, Junmin Peng, Yuxin Li, St. Jude Children's Research Hospital, Memphis, TN, USA

(P-031) **Small ID Capillary- HPLC-nESI-MS Degeneracy Study for Metabolomic Analysis of Human Serum Albumin and E-Coli Lysate.** Mahmoud Elhusseiny Mostafa[1], James Grinias[2], James Edwards[1], [1]Saint Louis University, Saint Louis, MO, USA; [2]Rowan University, Glassboro, NJ, USA

(P-032) **Chemical Derivatization of Phosphate Metabolites to Improve throughput in LC-MS Analysis.** Julius Agongo, James Edwards, Saint Louis University, Saint Louis, MO, USA

(P-033) **Evaluation of Mice Blood Concentration Quantities and Pharmacokinetic of Ginsenoside Rd and Rg3 using UPLC-MS/MS.** Eun Kyu Lee[1], Hye Hyun Yoo[1], Dong-Hyun Kim[2], [1]Hanyang University, Ansan-si Gyeonggi-do, SOUTH KOREA; [2]Kyunghee University, Seoul, SOUTH KOREA

(P-034) **Qualitative Molecular Networking Approach for Identification of Biologically Active Compounds of Cudrania tricuspidata Leaf Extract and Confirming Its Major Circulating Species in Rat Plasma after Oral Administration.** Jeong In Seo, Hye Hyun Yoo, Hanyang University, Ansan-si Gyeonggi-do, SOUTH KOREA

(P-035) **The Effect of Media on Nanoparticle-Antibody Conjugation in Rapid Paper Tests.** Hom Rijal[1], Godwin Ujilalele[2], Kim Hamad-Schifferli[2], [1]University of Massachusetts Boston, Medford, MA, USA; [2]University of Massachusetts Boston, Boston, MA, USA

(P-036) From (Almost) Nothing to (Almost) Everything: Metabolic Phenotyping of Developing Mice Hearts. María Sánchez-Díaz1 , Carolina González-Riaño2 , Coral Barbas2 , Andrés Hidalgo1 , Francisco J. Rupérez2 , 1Centro Nacional de Investigaciones Cardiovasculares, Madrid, SPAIN; 2Universidad San Pablo-CEU, Boadilla del Monte, SPAIN

(P-037) **Omega Fatty Acids in Dried Serum Spot in Relation to Asthma in Adult using Ultra-High Performance Liquid Chromatography-Tandem Mass Spectorometry.** Hyejin Lee, Hye-Ran Yoon, College of Pharmacy, Duksung Women's University, Seoul, SOUTH KOREA

(P-039) withdrawn

MSB 2021 Poster Presentations

(P-042) **Discovery of Sex-specific Biomarkers and Metabolic Pathways for Depression in a Sub-chronic Variable Stress Mouse Model.** Seulgi Kang[1], Jeonmi Lee[1], Woonhee Kim[2], ChiHye Chung[2], Ke Li[1], Yuli Liu[1], Inseon Hwang[1], Yua Kang[1], Boyeon Bae[1], Danbi Won[1], [1]Sungkyunkwan University, Suwon Gyeonggi-do, SOUTH KOREA; [2]Konkuk Univsersity, Seoul, SOUTH KOREA

(P-044) **Analytical Strategies for the Quality Control of Parathyroid Hormone Standards.** Laurent Nyssen, Marianne Fillet, Etienne Cavalier, Anne-Catherine Servais, University of Liege, Liege, BELGIUM

(P-045) **Paper-based Point-Of-Care Diagnostic Platform for Malaria Biomarker, Plasmodium Falciparum Histidine Rich Protein-2 (pfHRP-2), using Portable Mass Spectrometer.** Suji Lee, Abraham Badu-Tawiah, The Ohio State University, Columbus, OH, USA

(P-046) withdrawn

(P-047) **Leveraging the Power of a Core-Shell Particle to Improve Micro and Nano Flow Separations.** Jason Anspach, Roxana Eggleston-Rangel, Phenomenex, Torrance, CA, USA

(P-048) **Fractionation by Precipitation: Scalable and Rapid MW-based Proteome Separation Facilitated by the ProTrap XG.** Jessica Nickerson, Venus Baghalabadi, Alan Doucette, Dalhousie University, Halifax, Nova Scotia, CANADA

(P-049) **Improving Separation Performance by Implementation of Flow- and Temperature Gradients in LCxLC (TRLCxRPLC).** Kristina Wicht[1], Mathijs Baert[1], Norwin Von Doehren[2], Sonja Schipperges[3], André de Villiers[4], Frederic Lynen[1], [1]Ghent University, Ghent, BELGIUM; [2]Agilent Technologies, Middelburg, NETHERLANDS; [3]Agilent Technologies, Waldbronn, GERMANY; [4]University of Stellenbosch, Matieland, SOUTH AFRICA

(P-050) **NHS-Ester Tandem Labeling for Multiplex Quantitative Nanoproteomic Analysis.** Sansi Xing, Ruilin Wu, Akshat Pai, Lina Liu, Yu Lu, McMaster University, Hamilton, CANADA

(P-052) **Improved Immuno-affinity Enrichment Method for Ubiquitinated Peptides with High Sensitivity, Specificity and Robustness.** Barry Zee, Hayley Peckham, Alissa Nelson, Charles Farnsworth, Kathryn Abell, Jian Min Ren, Michael Palazzola, Joshua Nathan, Matthew Stokes, Cell Signaling Technology, Danvers, MA, USA

(P-053) **A Green, Globally Optimized Procedure for the Individual Quantification of Six α- and β-acids and Xanthohumol in Hops and Their Derived Products.** Leonardo Sartori[1], Amauri Souza[1], Felipe Bragagnolo[1], Gabriel Fortuna[1], Filipe Giardini[1], Valéria Sarnighausen[1], Renato Carneiro[2], Cristiano Funari[1], [1]São Paulo State University (UNESP), Botucatu, BRAZIL; [2]Federal University of São Carlos (UFSCAR), São Carlos, BRAZIL

(P-054) **Digital Microfluidics Combined with Mass Spectrometry for Single-cell Proteomics.** Jiaxi Peng, Aaron Wheeler, University of Toronto, Toronto, ON, CANADA

(P-055) **Affiblot: Semi-quantitative Selection and Characterization of Research Antibodies.** Zuzana Svobodová[1], Jakub Novotný[2], Barbora Ospálková[3], Klára Nemčeková[3], Katarína Tripská[1], František Foret[2], Zuzana Bílková[3], [1]Charles University, Faculty of Pharmacy, Department of Biological and Medical Sciences, Hradec Králové, CZECH REPUBLIC; [2]Institute of Analytical Chemistry of the CAS v. v. i, Brno, CZECH REPUBLIC; [3]University of Pardubice, Faculty of Chemical Technology, Dept. of Biological and Biochemical Sciences, Pardubice, CZECH REPUBLIC

MSB 2021 Poster Presentations

(P-056) **Study of an In vitro Model of Hypoxia-Induced Metabolic Alterations in HK-2 Cells using a Non-Targeted Metabolomics Strategy based on Liquid Chromatography-Mass Spectrometry.** Samuel Bernardo-Bermejo[1], Elena Sánchez-López[2], Lei Tan[1,3], Selma Benito-Martínez[1], Zhengjin Jiang[3], María Castro-Puyana[1], Francisco Javier Lucio-Cazaña[1], María Luisa Marina[1], [1]Universidad de Alcala, Madrid, SPAIN; [2]University Medical Center (current affiliation, Center for Proteomics and Metabolomics, Leiden University Medical Center), Leiden, THE NETHERLANDS; [3]Institute of Pharmaceutical Analysis, Jinan University, Guangzhou, CHINA

(P-057) **An Electrokinetic Chromatography Methodology using a Dual System based on the Combination of Carboxymethyl-γ-cyclodextrin and Tetrabutylammonium L-aspartic Acid Ionic Liquid for the Enantiomeric Determination of Clopidogrel in Pharmaceutical Formulations.** Laura García-Cansino, María Luisa Marina, María Ángeles García, Universidad de Alcalá, Madrid, SPAIN

(P-058) **Simultaneous Enantiomeric Separation of Carfentrazone Ethyl Herbicide and Its Hydrolysis Metabolite Carfentrazone by Cyclodextrin Electrokinetic Chromatography.** Laura García-Cansino, María Luisa Marina, María Ángeles García, Universidad de Alcalá, Madrid, SPAIN

(P-059) **Minimizing the Adsorption Behavior of Some Neuropeptides of the Neuromedin Family during LC-MS/MS Analysis.** Jana Bongaerts[1], Yana De Prins[1], Gigly Del'Haye[1], Dimitri De Bundel[1], Ilse Smolders[1], Debby Mangelings[2], Yvan Vander Heyden[2], Ann Van Eeckhaut[1], [1]Vrije Universiteit Brussel (VUB), Department of Analytical Chemistry, Applied Chemometrics and Molecular Modelling and Department of Pharmaceutical Chemistry Drug Analysis and Drug Information Center for Neurosciences (C4N), Jette, BELGIUM; [2]Vrije Universiteit Brussel (VUB), Department of Analytical Chemistry, Applied Chemometrics and Molecular Modelling, Jette, BELGIUM

(P-060) **Early Detection of Parasitic Malaria RNA through a Surface-Enhanced Raman Spectroscopy Biosensor.** Ashley Blackwell, Swarnapali De Silva Indrasekara, Logan Hamm, University of North Carolina at Charlotte, Charlotte, NC, USA

(P-061) **Applications of Complementary Chemoproteomic Workflows in Target Identification and Drug Discovery.** Francisco Garcia, Mike Jones, Jennifer Lipps, Lynn McGregor, Jason Murphy, Claude Shelton, Jason Thomas, Markus Schirle, Scott Brittain, Novartis Institutes for BioMedical Research, Cambridge, MA, USA

(P-062) **Optimization of a Microfluidic Platform for Semi-quantitative Determination of Essential Nutrients for Plants and Its Application in Precision Agriculture.** Jéssica Albuquerque, Cleyton Makara, Laís Brazaca, Vinícius Ferreira, Emanuel Carrilho, University of São Paulo, São Carlos, BRAZIL

SCIEX Microscale Separations Innovation Medal Award for current and breakthrough research in the field of Electrodriven Separations

The SCIEX Microscale Separations Innovations Medal and Award (previously the Arnold O. Beckman Award) is an annual award given to an individual for remarkable career achievements, with particular consideration being given to the development of new methods, techniques and high-impact applications in the field of electrodriven separations. The award is supported by SCIEX, a key driver in capillary electrophoresis technology and comprises a medal, a diploma and a monetary prize.

Recipients are chosen by a Selection Committee established by the Society for Microscale Separations and Bioanalysis (SMSB) that ranks the candidates according to the recommendation of peers and defined metrics (iCite from NIH). Evidence is presented for one or more of the following outstanding accomplishments:

- Conceptualization and development of unique instrumentation with an impact on electrodriven separations that has substantively advanced the field.
- Development of novel and important electrodriven methods or methodologies with significant beneficial applications in analytical sciences.
- Elucidation of fundamental phenomena involved in electrodriven separations.
- The work being recognized is current, meaning only research and achievements of the past 5 years are considered.

The awardee is selected by the SMSB Board before the conference. The award is presented annually during the following International Symposium on Microscale Separations and Bioanalysis in a special Award Plenary Session followed by a lecture from the recipient. The list of previous awardees can be found here.

The award is generously supported by SCIEX, key driver in the capillary electrophoresis business after integrating the Beckman Coulter CE team in 2013. The SCIEX Microscale Separations Innovation Medal Award for current and breakthrough research in the field of electrodriven separations is one way that SCIEX celebrates the spirit of scientific innovation that is critical to the advancement of microscale separations.

SCIEX helps to improve the world we live in by enabling scientists and laboratory analysts to find answers to the complex analytical challenges they face. The company's global leadership and world-class service and support in capillary electrophoresis and liquid chromatography-mass spectrometry have made it a trusted partner to the thousands of scientists and lab analysts worldwide who are focused on basic research, drug discovery and development, food and environmental testing, forensics and clinical research.

The recipient of the SCIEX Innovation Award 2021:

Dr. Peter Willis, Group Supervisor, Chemical Analysis & Life Detection, NASA Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

Presentation title: **Biosignatures, Electrophoresis, and the Search for Life Beyond Earth**

Peter Willis received his doctorate in chemistry from Cornell University, after designing and building a one-ton crossed molecular beams machine that he used to probe the fundamental nature of interactions between metal atoms and organic molecules. He continued his studies through postdoctoral fellowships at Rice University and Caltech, where he expanded his scientific horizons beyond spectroscopy and chemical reaction dynamics, and into the fields of carbon nanotechnology, molecular computing, systems biology, and biosensing. In recognition of his pioneering work on carbon fullerenes with Nobel Laureate Richard Smalley, on January 1st, 2000 he was highlighted by Maclean's magazine as one of the "100 Canadians to Watch in the New Millennium". Two years later, drawn by the inescapable pull of the search for life beyond Earth, he joined the technical staff of NASA's Jet Propulsion Laboratory. Dr. Willis is currently the Group Supervisor of JPL's Chemical Analysis and Life Detection group. His research focuses on invention of new methods and technologies capable of identifying and characterizing signatures of extraterrestrial life at the molecular level. Portable instrument systems developed in his group are validated in a variety of harsh terrestrial environments that range from high deserts and hypersaline lakes, to oceans and icy polar regions. The ultimate goal is to incorporate this technology into the payloads of robotic explorers bound for the ocean worlds of our outer solar system. To that end he has played a key role in the formulation of a variety of mission concepts to explore Titan, Enceladus, and Europa. In 2017 he co-authored the "Europa Lander Mission Science Definition Team Report", a publication which broadly serves as a guide to life detection for all future planetary missions in our solar system. In addition to laying the foundation for these missions of the coming decades, Dr. Willis also currently serves as staff scientist for the ongoing Perseverance Mars rover mission. His primary focus is on the use of chemical and mineralogical analysis to enable the selection of the most astrobiologically promising samples for potential return to Earth for analysis in terrestrial laboratories. And finally, Dr. Willis also has a strong commitment to academics, serving as Adjunct Professor in the Department of Chemistry at University of Kansas. He is a frequent reviewer for a wide range of chemistry-related scientific journals and has mentored over 40 individuals at the undergraduate, graduate, and postdoctoral levels during the course of his research.

Previous winners of the SCIEX Award and the Arnold O. Beckman Award

2020 Detlev Belder
2019 Aaron R. Wheeler
2018 Amy Herr
2017 Shigeru Terabe
2016 Bohuslav Gaš
2015 Gyula Vigh
2014 Barry Karger
2013 Stellan Hjertén
2012 Pier Giorgio Righetti

Thermo Fisher Scientific Early Career Award for breakthrough research advancing the field of Microscale Separations and Bioanalysis

The Thermo Fisher Scientific Early Career Award is the inaugural award given to an individual for remarkable research achievements, with particular consideration being given to the development of new methods, techniques, and high-impact applications in the field of microscale separations and bioanalysis. The award is supported by Thermo Fisher Scientific, a leader in life sciences and technology products, and comprises a plaque and a monetary prize.

The recipient is chosen by a Selection Committee established by the Society for Microscale Separations and Bioanalysis (SMSB) that ranks the nominated candidates according to the recommendation of peers and defined metrics (iCite from NIH). Evidence is presented for one or more of the following outstanding accomplishments:

- Conceptualization and development of unique technologies that have substantively advanced the field of microscale separations and bioanalysis.
- Development of novel and critical instrumentation or methodologies for microscale separations and bioanalysis with significant beneficial applications in analytical sciences.
- Elucidation of fundamental phenomena involved in microscale separations and bioanalysis.
- The work being recognized is current, meaning only research and achievements of the past seven years are considered.

The deadline for nomination is May 25, 2021 to be considered for the inaugural award.

Terms of reference for the 2021 Thermo Fisher Scientific Early Career Award

Eligibility Criteria: Candidates must meet all of the following requirements:

- Hold a doctorate degree in chemistry, biochemistry, biomedical sciences, or a related field and conduct research in the field of microscale separations and bioanalysis.
- As of **May 25th, 2021**, hold a full-time ***independent, tenure-track faculty appointment*** at the rank of assistant or associate professor or equivalent in the candidate's country, i.e., an independent **pre-tenure** faculty or equivalent position. Appointments such as research assistant professor, adjunct assistant professor, assistant professor research track, visiting professor, or sessional instructor (or equivalent) are not eligible.
- Must not have been appointed as an assistant or associate professor (i.e., an independent **pre-tenure** faculty or equivalent position) at **any** institution prior to **May 15th, 2016**. Time spent in clinical internships, residencies, in work toward board certification, or on parental or medical leave does not count as part of this five-year limit.
- Both nominations by colleagues and self-nominations will be accepted. All inquiries about the award should be sent to shannon@barrconferences.com.

All candidates are considered in the selection process. The awardee will be announced in June 2021. The award will be presented during the 2021 International Symposium on Microscale Separations and Bioanalysis "MSB 2021" in a special Award Plenary Session followed by a lecture from the recipient.

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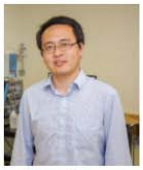


The recipient of the Thermo Fisher Scientific Early Career Award 2021:

Prof. Liangliang Sun, Assistant Professor, Department of Chemistry, Michigan State University, East Lansing, MI, USA

Presentation title: **Leveraging Capillary Electrophoresis-Mass Spectrometry for Multi-level Proteomics**

Dr. Liangliang Sun is an Assistant Professor in the Department of Chemistry at Michigan State University. He joined MSU in 2016. Before that, he worked with Prof. Norman Dovichi at University of Notre Dame as a postdoctoral fellow and later a Research Assistant Professor (2011-2016). He received his Ph.D. degree in Analytical Chemistry in 2011 from Dalian Institute of Chemical Physics, Chinese Academy of Sciences, advised by Profs. Yukui Zhang and Lihua Zhang. The Sun group aims to develop novel analytical methodologies based on capillary electrophoresis-tandem mass spectrometry (CE-MS/MS) for multi-level proteomics to characterize proteins (bottom-up proteomics), proteoforms (top-down proteomics), and protein complexes (native proteomics) in cells globally with high throughput, high sensitivity, and single-cell resolution. They deploy the multi-level proteomics to address important questions in developmental biology and cancer biology. He has published 100 peer-reviewed papers, which have accumulated 2300 citations (h-index: 30. Web of Science). His research group at Michigan State University has published 25 papers in the last four years. He has been recognized as an Emerging Investigator by the Journal of the American Society for Mass Spectrometry and Analytical Methods. He received the National Science Foundation CAREER AWARD in 2019.

Plenary Lectures

AMY E. HERR, John D. and Catherine T. MacArthur Professor, University of California, Berkeley, Berkeley, CA, USA

Plenary Lecture on **"Electrophoretic Cytometry: Single-cell and Sub-cellular Targeted Proteomics using Microfluidic Design"**

Amy E. Herr, Ph.D. is the MacArthur Professor at UC Berkeley, where she directs a bioengineering research group that addresses unmet measurement needs spanning fundamental life sciences (developmental biology) to clinical practice (oncology). At the interface of microsystems design, analytical chemistry, and protein science, her group designs precision microsystems to study biology, with a focus on targeted proteomic tools offering single-cell and subcellular resolution. Her research advances the "mathematization" of biology and medicine. She was a staff scientist at Sandia National Laboratories. She is an elected fellow of the National Academy of Inventors and the American Institute of Medical and Biological Engineering, is an NIH New Innovator, NSF CAREER awardee, Sloan Research Fellow, Ellen Weaver Awardee (AWIS) for mentoring, 2019 Faculty Award for Excellence in Postdoctoral Mentoring from UC Berkeley, and a City of Berkeley Visionary Awardee, among others. She sits on the NIH's National Advisory Council for Bioengineering, the DARPA Biological Insights Board, and is part of the US Air Force's Science Advisory Board. She has chaired the premiere conferences in her field (Gordon Research Conference, 2009; microTAS, 2021), directs the Bakar Fellows Program and the Bakar BioEnginuity Hub (opening 2022), and is a successful entrepreneur.

BARRY L. KARGER, James L. Waters Emeritus Chair and Distinguished Professor, Barnett Institute Emeritus Director, Northeastern University, Boston, MA USA

Founder's Lecture on **"Microscale Bioseparations and Analysis : A Look Into the Past and the Future"**

Barry L. Karger is the Emeritus James L. Waters Chair in Analytical Chemistry and Distinguished Professor at Northeastern University. He was the Founding and now Emeritus Director of the Barnett Institute of Chemical and Biological Analysis. In 1989, he was the Founding Chairman of the HPCE meeting, the forerunner of the present MSB series. Dr. Karger has been an active researcher with over 375 publications and 50 patents in the field of bioanalytical chemistry. He has been a major contributor to the development of HPLC, and his technology in capillary electrophoresis played a significant role in the Human Genome Project. More recently, he was involved in the development of new technologies for proteomics, especially trace level LC/MS analysis of proteins in biological matrices, and comprehensive characterization of complex biopharmaceuticals. He has co-founded several companies and actively collaborated with others in the biotechnology industry. Over 125 Ph.D. students, postdocs and staff scientists have gone onto distinguished careers from his laboratory. Dr. Karger has received many honors including three American Chemical Society awards, the Bergman Medal from the Swedish Chemical Society, the Herovsky Gold Medal from the Czech Academy of Sciences, and the Beckman Medal.

LUKE P. LEE, Professor, Harvard Medical School, Department of Medicine, Brigham Women's Hospital, Boston, MA, USA

Plenary Lecture on **"Organoids Microphysiological Analysis Platforms (MAP) and Exosome Detection via the Ultrafast-isolation System (EXODUS)"**

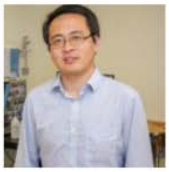
Prof. Luke P. Lee received both his BA in Biophysics and PhD in Applied Physics and Bioengineering from UC Berkeley. He joined the faculty at the UC Berkeley in 1999 after more than a decade of industry experience. He became the Lester John and Lynne Dewar Lloyd Distinguished Professor of Bioengineering in 2005. He also served as the Chair Professor in Systems Nanobiology at the ETH Zürich from 2006 to 2007. He became Arnold and Barbara Silverman Distinguished Professor at Berkeley in 2010. He founded the Biomedical Institute for Global Healthcare Research & Technology (BIGHEART) at the National University of Singapore. He is the founding director of Institute for Quantum Biophysics, Sungkyunkwan University, Korea. He is a Fellow of the Royal Society of Chemistry and the American Institute of Medical and Biological Engineering. His work at the interface of biological, physical, and engineering sciences for medicine has been recognized by many honors including the IEEE William J. Morlock Award, NSF Career Award, Fulbright Scholar Award, and the HoAm Prize. Lee has over 350 peer-reviewed publications and over 60 international patents filed. His current research interests are exosome, organoids MAP, early detection of infectious diseases, cancer, and neurodegenerative diseases.

Plenary Lectures

MATTHIAS MANN, Professor, Department of Proteomics and Signal Transduction, Max-Planck-Institute of Biochemistry, Munich, GERMANY and Director of Proteomics Program, Novo Nordisk Foundation Center for Protein Research, Faculty of Health and Medical Sciences, University of Copenhagen, DENMARK

Plenary Lecture on **"Robust and In-depth Work Flows for Single Cell and Clinical Proteomics"**

Matthias Mann studied physics and mathematics at Göttingen University in Germany and obtained his Ph.D. in chemical engineering at Yale where his work contributed to the Nobel Prize for his supervisor John Fenn in 2012 for the development of electrospray ionization. Thereafter at the University of Southern Denmark he developed the first bioinformatic search algorithms for peptide fragmentation data and SILAC, a paradigm-shifting method of quantitative proteomics and a breakthrough in the mapping of protein interactions. In 2005 Matthias Mann was appointed head of the Department of Proteomics and Signal Transduction at the Max Planck Institute of Biochemistry, Martinsried near Munich and since 2009 has an additional appointment as director of the Department of Proteomics, Novo Nordisk Foundation Center for Protein Research at the University of Copenhagen. His work has been decisive in making mass spectrometry applicable to molecular biology. He has developed computer algorithms to match mass spectrometric data with sequence databases and introduced methods for accurate quantitation into proteomics and downstream biology. His team works in proteomics technology development and performs global large-scale proteomic and phosphoproteomic studies in different biological questions and medical fields. The Mann laboratory is a technical leader in the field of mass spectrometry and has pushed the technology ever-deeper coverage of proteomes for over two decades. The group increasingly focusses on clinically relevant topics, especially the analysis of the blood plasma proteome. The establishment of a robust and reproducible high-throughput proteome profiling pipeline for the analysis of whole blood, plasma and serum samples will soon allow the proteomic screening of clinical cohorts for new biomarkers or biomarker patterns. He has been elected as a member of EMBO, the Royal Danish Academy of Arts and Sciences and the Leopoldina German National Academy of Sciences. In 2012 he was awarded the Leibniz Prize from the German Research Foundation, the Ernst Schering Prize, the Louis-Jeantet Foundation Prize for Medicine and the Körber European Science Prize. In 2015 was awarded the Barry L. Karger Medal in Bioanalytical Chemistry and the Theodor Bücher Lecture and Medal as well as the Danish Order of Dannebrog Knights Cross and in 2019 was nominated as a member of the Bavarian Academy of Sciences and Humanities. He holds two honorary doctorates. He is author of over 700 publications and one of the most cited scientists worldwide with an h-factor of 237 and more than 260,000 total citations (Google Scholar).



Recipient of the Thermo Fisher Scientific Early Career Award 2021:

LIANGLIANG SUN, Assistant Professor, Department of Chemistry, Michigan State University, East Lansing, MI, USA

Presentation title: "**Leveraging Capillary Electrophoresis-Mass Spectrometry for Multi-level Proteomics**"

Dr. Liangliang Sun is an Assistant Professor in the Department of Chemistry at Michigan State University. He joined MSU in 2016. Before that, he worked with Prof. Norman Dovichi at University of Notre Dame as a postdoctoral fellow and later a Research Assistant Professor (2011-2016). He received his Ph.D. degree in Analytical Chemistry in 2011 from Dalian Institute of Chemical Physics, Chinese Academy of Sciences, advised by Profs. Yukui Zhang and Lihua Zhang. The Sun group aims to develop novel analytical methodologies based on capillary electrophoresis-tandem mass spectrometry (CE-MS/MS) for multi-level proteomics to characterize proteins (bottom-up proteomics), proteoforms (top-down proteomics), and protein complexes (native proteomics) in cells globally with high throughput, high sensitivity, and single-cell resolution. They deploy the multi-level proteomics to address important questions in developmental biology and cancer biology. He has published 100 peer-reviewed papers, which have accumulated 2300 citations (h-index: 30. Web of Science). His research group at Michigan State University has published 25 papers in the last four years. He has been recognized as an Emerging Investigator by the Journal of the American Society for Mass Spectrometry and Analytical Methods. He received the National Science Foundation CAREER AWARD in 2019.

MEHMET TONER, Helen Andrus Benedict Professor of Biomedical Engineering, Co-Director, Center for Engineering in Medicine & Surgery, Massachusetts General Hospital & Harvard Medical School, Harvard-MIT Health Sciences & Technology, Boston, MA, USA

Plenary Lecture on **"Microfluidic Sorting of Extremely Rare Circulating Tumor Cells and Clusters from Blood"**

Dr. Toner holds the Helen Andrus Benedict Professor of Biomedical Engineering at the Massachusetts General Hospital, Harvard Medical School, and Harvard-MIT Division of Health Sciences and Technology. He serves as the Director of Research at the Shriners Hospitals for Children in Boston, and the Co-Director of the Center for Engineering in Medicine and Surgery. Dr. Toner received BS degree from Istanbul Technical University and MS degree from the Massachusetts Institute of Technology (MIT), both in Mechanical Engineering. Subsequently he completed his PhD degree in Medical Engineering at Harvard-MIT Division of Health Sciences and Technology in 1989. Dr. Toner published more than 350 original articles and has delivered 400+ presentations. His research involves microfluidics, nano- and micro-technologies, tissue engineering and regenerative medicine, cryobiology. Dr. Toner is also co-founder of multiple biotechnology and medical device start-ups. Dr. Toner is a Fellow of "the American Institute of Medical and Biological Engineering"; "the American Society of Mechanical Engineers", and "the Society for Cryobiology." He received several awards from the American Society of Mechanical Engineers including "YC Fung Young Scientist Award" (1994), "H.R. Lissner Medal" (2013), "Savio-Woo Medal" (2020). In 2012, he was given the "Luyet Medal" by the Society for Cryobiology. He is also a member of the US National Academy of Inventors, US National Academy of Engineering, and the US National Academy of Medicine.

Plenary Lectures

GREGORY VERDINE, President, Chief Executive Officer, FogPharma, Cambridge, MA, USA

Plenary Lecture on "**Toward Universal Druggability**"

Dr. Greg Verdine is a leader in the discovery, development and commercialization of new drug modalities. A passionate and accomplished inventor of novel approaches and drug classes to engage targets widely believed intractable, Dr. Verdine coined the phrase "drugging the undruggable" to describe his life's mission. FogPharma was born from the new modality scientific work of Dr. Verdine. Together with co-founder WeiQing Zhou, he developed the scientific and business concept for the company and co-led its capitalization and operationalization in mid-2016. Dr. Verdine held the role of Chairman of the Board from company founding until December 2020. Dr. Verdine is highly regarded for having moved seamlessly between roles as an academic scientist, biotech entrepreneur, investor, and company executive. As Erving Professor at Harvard University and Harvard Medical School, he invented stapled peptides, including the precursor to the Phase II molecule ALRN 6924, and also made seminal contributions to understanding fundamental mechanisms of DNA repair and epigenetic DNA methylation. As an entrepreneur, Dr. Verdine has founded multiple, public biotech companies including Variagenics, Enanta, Eleven Bio, Tokai, Wave Life Sciences, and Aileron, and a private company, Gloucester Pharmaceuticals, that was acquired by Celgene. These companies have succeeded in achieving FDA approval for three marketed drugs. Dr. Verdine has served on the board of directors of Enanta Pharmaceuticals, Wave Life Sciences, Warp Drive Bio, and LifeMine Therapeutics. Having led the formation and financing of Wave Life Sciences, Warp Drive Bio and LifeMine, Dr. Verdine took a role in managing these companies as their president, chief executive officer and chief scientific officer. Dr. Verdine earned his Ph.D. in chemistry from Columbia University and served as an NIH postdoctoral fellow in molecular biology at MIT and Harvard Medical School.

The recipient of the SCIEX Innovation Award 2021:

PETER WILLIS, Group Supervisor, Chemical Analysis & Life Detection, NASA Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

Presentation title: "**Biosignatures, Electrophoresis, and the Search for Life Beyond Earth**"

Peter Willis received his doctorate in chemistry from Cornell University, after designing and building a one-ton crossed molecular beams machine that he used to probe the fundamental nature of interactions between metal atoms and organic molecules. He continued his studies through postdoctoral fellowships at Rice University and Caltech, where he expanded his scientific horizons beyond spectroscopy and chemical reaction dynamics, and into the fields of carbon nanotechnology, molecular computing, systems biology, and biosensing. In recognition of his pioneering work on carbon fullerenes with Nobel Laureate Richard Smalley, on January 1st, 2000 he was highlighted by Maclean's magazine as one of the "100 Canadians to Watch in the New Millennium". Two years later, drawn by the inescapable pull of the search for life beyond Earth, he joined the technical staff of NASA's Jet Propulsion Laboratory. Dr. Willis is currently the Group Supervisor of JPL's Chemical Analysis and Life Detection group. His research focuses on invention of new methods and technologies capable of identifying and characterizing signatures of extraterrestrial life at the molecular level. Portable instrument systems developed in his group are validated in a variety of harsh terrestrial environments that range from high deserts and hypersaline lakes, to oceans and icy polar regions. The ultimate goal is to incorporate this technology into the payloads of robotic explorers bound for the ocean worlds of our outer solar system. To that end he has played a key role in the formulation of a variety of mission concepts to explore Titan, Enceladus, and Europa. In 2017 he co-authored the "Europa Lander Mission Science Definition Team Report", a publication which broadly serves as a guide to life detection for all future planetary missions in our solar system. In addition to laying the foundation for these missions of the coming decades, Dr. Willis also currently serves as staff scientist for the ongoing Perseverance Mars rover mission. His primary focus is on the use of chemical and mineralogical analysis to enable the selection of the most astrobiologically promising samples for potential return to Earth for analysis in terrestrial laboratories. And finally, Dr. Willis also has a strong commitment to academics, serving as Adjunct Professor in the Department of Chemistry at University of Kansas. He is a frequent reviewer for a wide range of chemistry-related scientific journals and has mentored over 40 individuals at the undergraduate, graduate, and postdoctoral levels during the course of his research.

JOHN YATES, Ernest W. Hahn Professor, Departments of Molecular Medicine and Neurobiology, The Scripps Research Institute, La Jolla, CA, USA

Plenary Lecture on "**Proteomics 3.0: "Space" the New Frontier**"

John R. Yates is the Ernest W. Hahn Professor in the Departments of Molecular Medicine and Neurobiology at Scripps Research. His research interests include development of integrated methods for tandem mass spectrometry analysis of protein mixtures, bioinformatics using mass spectrometry data, and biological studies involving proteomics. He is the lead inventor of the SEQUEST software for correlating tandem mass spectrometry data to sequences in the database and developer of the shotgun proteomics technique for the analysis of protein mixtures. His laboratory has developed proteomic techniques to analyze protein complexes, posttranslational modifications, organelles and quantitative analysis of protein expression for the study of biology. He has received awards including the ASMS Biemann Medal, HUPO Achievement Award, Christian Anfinsen Award (Protein Society), Analytical Chemistry award (ACS), Ralph N. Adams Award, Thomson Medal (IMSF), John B. Fenn Award (ASMS), HUPO Discovery Award. He is currently the EIC at the Journal of Proteome Research.

Session Chairs and Scientific Organizers

SUSAN E. ABBATIELLO, Interim Director, The Barnett Institute of Chemical and Biological Analysis, Department of Chemistry and Chemical Biology, Northeastern University, Boston, MA, USA

Susan Abbatiello earned a B.A. in Chemistry at The College of the Holy Cross. She worked for 5 years at Genetics Institute (Andover, MA) in the Biopharmaceutical Characterization and Analysis group before returning to graduate school. Susan earned her Ph.D. in Analytical Chemistry at the University of Florida, working under advisement of Drs. John Eyler and Nigel G. J. Richards, focusing on the quantitation of a protein suspected to play a role in drug-resistant acute lymphoblastic leukemia. Susan worked as a post-doc in the Clinical Proteomics facility at the University of Pittsburgh for Dr. Thomas P. Conrads, where she continued efforts in targeted proteomics research with a focus on cancer. In 2008, Susan moved to the role of Scientist in the Proteomics Platform at the Broad Institute (Dr. Steven Carr), where she served as co-chair of the NCI CPTAC (National Cancer Institute Clinical Proteomics Technology Assessment for Cancer) working group to evaluate stable isotope dilution selected reaction monitoring for the quantitation of plasma proteins related to cancer. In 2014, Susan transitioned to the role of Triple Quadrupole Product Specialist at Thermo Fisher Scientific and took on the responsibilities of FAIMS Product Manager in 2015. In 2018, Susan moved to the role of Executive Director of the Barnett Institute for Chemical and Biological Analysis, overseeing the Mass Spectrometry Core Lab. In 2020, she accepted the position of Interim Director of the Barnett Institute, while continuing the MS Core Lab responsibilities.

ABRAHAM BADU-TAWIAH, Associate Professor, Chemistry and Biochemistry, The Ohio State University, Columbus, OH, USA

Abraham Badu-Tawiah obtained his Ph.D. (2012) in Chemistry from Purdue University under the supervision of Graham Cooks. From 2012 to 2014, he was a postdoctoral fellow at Harvard University under the direction of George Whitesides. He joined The Ohio State University, Department of Chemistry and Biochemistry in July 2014 as an Assistant Professor. In June 2020, Dr. Badu-Tawiah was promoted to Associate Professor with tenure. Dr. Badu-Tawiah is a recipient of 2020 Sloan Fellowship Award, 2019 NIH MIRA for New Investigators Award, 2018 ACS Division of Analytical Chemistry Arthur F. Findeis Award, 2017 Eli Lilly Young Investigator Award in Analytical Chemistry, 2017 American Society for Mass Spectrometry Research Award, and 2016 Department of Energy Early Career Award. His current research is focused on the development of new mass spectrometry techniques for disease detection, and the studies of novel ion chemistry in charged micro-droplets.

TOMASZ BĄCZEK, Professor, Head of the Department, Department of Pharmaceutical Chemistry, Medical University of Gdańsk, Gdańsk, POLAND

Tomasz Bączek graduated from Medical University of Gdańsk, Poland. His Ph.D. thesis was focused on computer-assisted optimization of separation conditions in liquid chromatography and quantitative structure-retention relationships. He was a postdoctoral research associate in Barnett Institute at Northeastern University, Boston, MA, USA, where he worked on improvements of peptides' identification in proteomics. He completed also the science-innovation internship (within Top 500 Innovators program) at Stanford University, CA, USA. His main research interest comprises analytical chemistry, pharmaceutical and biomedical analysis, medicinal and biomolecular chemistry, separation sciences, proteomics and metabolomics. Prof. Tomasz Bączek is a co-author of over 240 original papers in peer-reviewed journals. He is former vice-dean of the Faculty of Pharmacy (2008-2012), and former vice-rector for research at the Medical University of Gdańsk (2012-2016 and 2016-2020). Currently he is the head of the Department of Pharmaceutical Chemistry at the Medical University of Gdańsk, and is also the rector's representative and the head of the office for "Excellence Initiative – Research University" program for top 10 best Polish universities.

CHENGXI CAO, Full Professor with Tenure, Department of Instrument Science and Engineering, Shanghai Jiao Tong University, Shanghai, CHINA

Dr. C. X. Cao is a full professor with tenure in Instrument Science and Engineering of Shanghai Jiao Tong University (SJTU). He achieved his Bachelor of Medicine from Wannan Medical College (WMC) in 1988 and his Ph.D. of Chemistry from University of Science and Technology of China (USTC) in 2000. He obtained the position of Associate Professor of WMC in 1998, USTC during 2001-2002 and SJTU during 2002-2003, and his position of Professor of SJTU from 2004. His interesting is focusing on fundament on moving reaction boundary (MRB), MRB-based electrophoresis biosensing, MRB-based isoelectric focusing and free-flow electrophoresis. He has published more than 180 articles in international journals and applied more than 60 patents on electrophoresis techniques and instruments. Currently, He has served as the Scientist-in-Chief on Development of National Scientific Instrument from both the Ministry of Science and Technology of China since 2011 and the Nature Science Funding of China since 2017, and the deputy director on Shanghai Engineering Research Center for Intelligent Diagnosis and Treatment. In addition, he successfully hold the International Conference on Asia-Pacific Capillary Electrophoresis (APCE 2017) in 2017.

SHUJIA (DANIEL) DAI, Senior Principal Scientist, Lab Head, Proteomics, Translational Science, Sanofi US, Cambridge, MA, USA

Dr. Shujia Dai is a Senior Principal Scientist, Lab Head of Proteomics of Translational Sciences at Sanofi. Aiming to find better therapeutics for patients, Dr. Dai's group is dedicated to understanding biology and pharmacology systematically in the early drug discovery stage. His research works mainly focus on the development and application of mass spectrometry-based proteomic technologies in target identification/credentialing (chemoproteomics and CETSA), large-scale biomarker discovery/validation for evaluation of therapeutic prognosis and patient stratification, characterization of protein-complex and PPIs, and a better understanding of the mechanism of action of drugs in various human diseases using system biology approaches. Before his industrial career, Dr. Dai started his postdoctoral training in Dr. Barry L. Karger's group and later served as a Research Assistant Professor in the Barnett Institute at Northeastern University, working on global and targeted proteomics applications using ultra-high sensitive nanoLC-MS techniques and comprehensive protein structural and conformational (with PTMs) characterizations using advanced ETD/CID/HCD MS/MS techniques. Dr. Dai obtained his Ph.D. (2005) in Analytical Chemistry at the Beijing Institute of Radiation Medicine, Beijing, China, working under the advisement of Dr. Xiaohong Qian, on the development of structural characterization and high throughput LC-MS methods for biologics in preclinical pharmacokinetics studies.

JAMES L. EDWARDS, Associate Professor, Department of Chemistry, Saint Louis University, St. Louis, MO, USA

Jim received his Ph.D. from the University of Michigan where he developed novel separation and MS based techniques for analyzing small molecules. He conducted post-doctoral training at the Juvenile Diabetes Research Foundation Center for Diabetic Complications. He started his academic career at the University of Maryland in 2008 and moved to the Chemistry Department at Saint Louis University in 2012. Jim currently serves the editorial advisory board of *Analytical Chemistry* (ACS) and *Molecular Omics* (RSC). The focus of the Edwards' lab is investigating metabolic dysfunctions in diabetic cardiovascular complications through the use of capillary based separations coupled to mass spectrometry. His work includes chemical isotope tagging, capillary LC-MS, isotope tracing/flux, microfluidics and novel sample preparation methods.

FRANTISEK FORET, Director of the Institute of Analytical Chemistry, Brno, CZECH REPUBLIC

Frantisek Foret is the director of the Institute of Analytical Chemistry and head of the Department of Bioanalytical Instrumentation. His main research interests include capillary separations, laser-based detection, miniaturization, and mass spectrometry coupling. Besides working as a senior deputy editor of Electrophoresis, he is also an Associate Director of CASSS – an International Separation Science Society and member of the Learned Society of the Czech Republic. Dr. Foret has authored and co-authored over 200 publications listed by WoS, a monograph on Capillary Zone Electrophoresis, 15 book chapters, dozens of invited and plenary lectures at international conferences, and 22 (13 US) patents. WoS citations (without auto citations) over 6000; H-index 46.

ELAIN FU, Associate Professor of Bioengineering, School of Chemical, Biological, and Environmental Engineering, Oregon State University, Corvallis, OR, USA

Elain Fu is an Associate Professor of Bioengineering at Oregon State University. Elain received a Sc.B. degree in Physics from Brown University, and M.S. and Ph.D. degrees in Physics from the University of Maryland, College Park. Her research focus has been microfluidics-based sensor development with the goal of using an understanding of the physics and chemistry of device operation to improve device performance for field applications. Most recently, she has been active in the area of paper and fabric-based microfluidics. In particular, her lab develops tools for the manipulation of reagents in porous materials, in the context of high-performance analyte detection for precision health applications. She has published over 50 articles in peer-reviewed journals and is a co-inventor on multiple patents.

Session Chairs and Scientific Organizers

ADAM B. HALL, Assistant Professor, Biomedical Forensic Sciences Program, Boston University School of Medicine, Boston, MA, USA

Dr. Adam B. Hallis an Assistant Professor within the Biomedical Forensic Sciences Program, Department of Anatomy and Neurobiology at Boston University School of Medicine where he instructs and mentors graduate students in various areas of forensic chemistry and instrumental analysis. Dr. Hall is also the lead Editor of the Forensic Science Handbooks, a widely distributed desk reference in the field. His career has taken him from the crime scene to the crime lab as a forensic chemist with the Massachusetts State Police Crime Laboratory and now the academic lab. Previously, he was the Director of the Mass Spectrometry Facility at the Barnett Institute of Chemical and Biological Analysis, and a Lecturer within the Department of Chemistry and Chemical Biology at Northeastern University in Boston, Massachusetts. He earned a Bachelor's degree in Chemistry from Stonehill College, a Master's degree in Chemistry and a Ph.D. in Analytical Chemistry from Northeastern University.

ROB HASELBERG, Assistant Professor, Division of BioAnalytical Chemistry, Vrije Universiteit Amsterdam, Amsterdam, THE NETHERLANDS

Dr. Rob Haselberg is assistant professor at the Vrije Universiteit Amsterdam. He has a strong background in capillary electrophoresis and liquid chromatography hyphenated with mass spectrometry to characterize intact proteins. This ranges from proteins as small as insulin up to large protein complexes. In all this research the goal is to keep the protein intact from sample to detector, as this reduces data complexity and minimizes risk of introducing artefacts along the way. As studying these properties of intact proteins is not straightforward, he develops and applies the required advanced hyphenated analytics. All of this is done in the context of biopharmaceutical, clinical, and doping analysis, often in collaboration with companies and other university groups.

ANDY HIGH, Director, Research Operations, Center for Proteomics and Metabolomics, St. Jude Children's Research Hospital, Memphis, TN, USA

Andy High joined the Center for Proteomics and Metabolomics at St. Jude Children's Research Hospital in 2005. He received his Ph.D. in Chemistry at the University of Virginia under the guidance of Dr. Donald Hunt, followed by a postdoctoral fellowship at the l'Universite Louis Pasteur, France, in the lab of Dr. Alain van Dorsselaer. Andy has more than 20 years of experience in mass spectrometry and proteomics. He oversees a facility with 8 state of the art mass spectrometers and 13 full time employees. The Center focuses on developing cutting edge techniques in proteomics, metabolomics and bioinformatics and applying them to try and solve complex biological systems. In his free time Andy enjoys running, playing and coaching soccer and basketball, and traveling with his family.

STEPHEN C. JACOBSON, Professor, Dorothy & Edward Bair Chair, Department of Chemistry, Indiana University, Bloomington, IN, USA

Stephen C. Jacobson is a Professor of Chemistry and holds the Dorothy & Edward Bair Chair in Chemistry at Indiana University (IU). He received a B.S. in mathematics from Georgetown University in 1988 and a Ph.D. in chemistry from the University of Tennessee in 1992. After graduate school, Stephen was awarded an Alexander Hollaender Distinguished Postdoctoral Fellowship at Oak Ridge National Laboratory (ORNL), and in 1995, he became a research staff member at ORNL. In 2003, Stephen joined the faculty in the Department of Chemistry at IU. His research efforts are directed toward miniaturization of analytical instrumentation with an emphasis on micro- and nanofluidic devices. Stephen and his research group are actively working in the areas of microfluidic separations, nanofluidic transport, cancer screening, virus sensing and assembly, and bacterial development and aging.

RYAN T. KELLY, Associate Professor, Department of Chemistry and Biochemistry, Brigham Young University, Provo, UT, USA

Dr. Kelly is an Associate Professor in the Department of Chemistry and Biochemistry at Brigham Young University (BYU). He received his Ph.D. in analytical chemistry in 2005 from BYU and spent the next 13 years at Pacific Northwest National Laboratory where he began as a postdoc and ultimately served as Chief Technologist for the EMSL, a national scientific user facility. A central theme of Dr. Kelly's research has been the development of new technological solutions for improved biochemical analyses, including mass spectrometry based omics. Recent research efforts have focused on improved sample preparation, separations, ionization and mass spectrometry for single-cell and near-single-cell proteomics. Dr. Kelly has authored or coauthored more than 100 publications and is a named inventor on 14 issued and pending patents, several of which have been licensed and commercialized. His work has been recognized with several awards including two R&D 100 awards, a Federal Laboratory Consortium Award for Excellence in Technology Transfer, the Georges Guiochon HPLC Faculty Fellowship and the HTC Innovation Award.

TAKEHIKO KITAMORI, Yushan Honorary Chair Professor, Institute of Nanoengineering and Microsystems iNEMS Department of Power Mechanical Engineering National Tsing Hua University, Hsinchu City, TAIWAN

Takehiko Kitamori is Yushan Honorary Professor at the National Tsing Hua University, Taiwan, Project Professor at the University of Tokyo, Japan, and Honorary Visiting Professor of Lund University, Sweden. He received his BS degree in the Department of Pure and Applied Science in 1980, and his Ph.D. degree in engineering in1989, both from the University of Tokyo. He was Vice President after serving as Dean of School of Engineering at The University of Tokyo, and he was responsible for internationalization of entire university. He is the author of more than 300 journal papers and has written more than 50 book chapters. His current research interest includes microfluidics and nanofluidics, applied laser spectroscopy for ultrasensitive detection, femto-liter analytical chemistry, and extended nano space chemistry. He was awarded many honors including Simon-Widmer Award of Swiss Chemical Society. He is Foreign Member of The Royal Swedish Academy of Science, and Honorary Doctor of Lund University.

OLEG V. KROKHIN, Associate Professor, Department of Internal Medicine, University of Manitoba, Winnipeg, MB, CANADA

Dr. Oleg Krokhin received his Ph.D. degree from Moscow State University specializing in analytical chemistry (ion chromatography). Currently working at the University of Manitoba, Winnipeg (Canada) - his research interests include study and development of peptide separation methods for applications in proteomics. He is the author of benchmark retention models (Sequence-Specific Retention Calculator, SSRCalc) for peptide separation using reversed-phase HPLC, HILIC, SCX, and CZE. His publication record includes 130+ peer-reviewed articles covering various aspects of peptide separation and applied proteomics.

GUINEVERE S.M. LAGVEEN-KAMMEIJER, Post-doctoral Researcher, Center for Proteomics and Metabolomics, Leiden University Medical Center, Leiden, THE NETHERLANDS

Guinevere S.M. Lageveen-Kammeijer received her Ph.D. on exploring prostate-specific antigen (PSA), the well-known biomarker for prostate cancer, and its glycosylation by capillary electrophoresis and mass spectrometry. Currently, Guinevere performs her post-doctoral research at the Center for Proteomics and Metabolomics at the Leiden University Medical Center, in the group of prof. Manfred Wuhrer. Her main research line is focused to further expanding her Ph.D. research, identifying potential biomarkers of prostate cancer, where she particularly concentrates on changes in post-translational modifications on PSA and other tumor antigens as well as biopharmaceuticals. To widen her horizon and deepen her analytical knowledge, she performed a 4-month project on the development and evaluation of analytical approaches for the characterization of protein variants under supervision of Prof. Dr. Alexander Ivanov at the Chemistry and Chemical Biology Department at Barnett Institute at Northeastern University, Boston, MA in 2017. Overall, her research interests are focused on bringing researchers together from various fields (e.g. analytical development, biomarker discovery and clinical laboratory professionals) to ensure a better translation of potential biomarkers to the clinic. Moreover, she is dedicated to convincing her fellow colleagues that glycosylation is an important subject and should not be neglected just because it is rather complicated.

Session Chairs and Scientific Organizers

JEONGMI LEE, Associate Professor, School of Pharmacy, Sungkyunkwan University, Gyeonggi-do, REPUBLIC OF KOREA

Jeongmi is an Associate Professor Sungkyunkwan University School of Pharmacy (Suwon, Republic of Korea). She earned her B.S. degree (Pharmacy, 1997) and M.S. degree (Pharmaceutical Analysis, 1999) from Seoul National University (Seoul, Republic of Korea). She received her Ph.D. (2008) in Molecular Biophysics from the University of Texas Southwestern Medical Center (Dallas, TX, USA). Her research group aims to: (1) perform application and fundamental studies on green solvents with focus on deep eutectic solvents, (2) discover biomarkers and understand the underlying mechanisms of diseases and drugs via metabolomics, and (3) to develop green sample preparation methods for quantitative analysis of endogenous and exogenous molecules. She has been serving as an Editor or Associate Editor of Journal of Analytical Science & Technology, Archives of Pharmacal Research, and Journal of Ginseng Research and as an Editorial Board Member of Scientific Reports and Molecules.

YU LU, Assistant Professor, Department of Biochemistry and Biomedical Sciences, McMaster University, Hamilton, Ontario, CANADA

Dr. Yu Lu's expertise lies in proteomic sample processing, nanoproteomics, stem cell biology, and protein-protein/protein-RNA interaction analysis using mass spectrometry. Yu received his Ph.D. in chemistry from University of Washington in 2006, after working in Dr. Ruedi Aebersold's laboratory at Institute for Systems Biology. He did his postdoc training with Dr. Jarrod Marto at Dana-Farber Cancer Institute and Harvard Medical School, focusing on applying sensitive phosphoproteomic methods to understand the molecular mechanisms underlying human pluripotent stem cell self-renewal and differentiation. He then joined Moderna Therapeutics in 2014, leading the effort to establish a proteomics laboratory within the messenger RNA therapeutics pioneering company to characterize translational products from the messenger RNA therapeutics candidates, and to investigate biochemical interactions between cellular proteins and the messenger RNA therapeutics candidates. Yu moved to McMaster University, Ontario, Canada in 2016 to start his independent lab. Currently he is an assistant professor in biochemistry at McMaster University.

PETER NEMES, Associate Professor, Department of Chemistry & Biochemistry, University of Maryland, College Park, MD, USA

Peter Nemes is an Associate Professor of Chemistry and Biochemistry at the University of Maryland, College Park (UMD). He obtained a M.Sc. in Chemistry (*summa cum laude*) from the Eotvos Lorand University (Budapest, Hungary) and Ph.D. in Chemistry from the George Washington University (Washington, DC). Dr. Nemes completed postdoctoral training in analytical neuroscience with Prof. Dr. Jonathan V. Sweedler at the University of Illinois at Urbana-Champaign, IL. Research in the Nemes Laboratory develops ultrasensitive and microanalytical platforms for high-resolution MS to study metabolic and proteomic processes in cell and neurodevelopmental biology. The group has uncovered metabolic and proteomic differences between single embryonic cells and discovered small molecules capable of altering normal cell fate specification. The group also discovered cell-by-cell metabolic communication between cells that pattern the embryonic body plan. These results challenge basic understanding of molecular processes coordinating embryonic and brain development with implications in human health. Research in the group has been recognized by several honors, including a *Beckman Young Investigator* award (Arnold and Mabel Beckman Foundation), a Robert J. Cotter New Investigator Award (US HUPO), and an ASMS Research Award. Prof. Dr. Nemes is a recipient of an NSF CAREER award and an NIH Outstanding Research Award (R35).

RAWI RAMAUTAR, Associate Professor, Leiden University, Leiden Academic Centre for Drug Research, Leiden, THE NETHERLANDS

Rawi Ramautar obtained his Ph.D. on the development of capillary electrophoresis-mass spectrometry methods for metabolomics from Utrecht University, the Netherlands, in 2010. Intrigued by metabolomics for disease prediction and diagnosis, Rawi switched to the Leiden University Medical Center to broaden his horizon on this topic. In 2013 and 2017, he received the prestigious Veni and Vidi research grants from the Netherlands Organization for Scientific Research for the development of CE-MS approaches for volume-restricted metabolomics. Currently, he is an associate professor at the Leiden University where his group is developing microscale analytical workflows for sample-restricted biomedical problems. Rawi Ramautar was recently selected for the Top 40 under 40 Power List of the Analytical Scientist. He is editor of Microchemical Journal (Elsevier).

VINCENT REMCHO, Professor, Department of Chemistry & Materials Sciences, Oregon State University, Corvallis, OR, USA

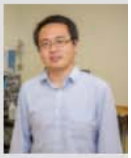
Vince Remcho is the Patricia Valian Reser Faculty Scholar and Honors College Eminent Professor in Chemistry and the Materials Science program, with adjunct appointments in Biochemistry and in Industrial & Manufacturing Engineering. His group develops microdevices for clinical analysis and detection of adulterated pharmaceuticals, and builds microsystems for nanomaterial synthesis. This work has been funded by NSF, NIH, US DoE, AFRL, ARL and ONR, and by the W.M. Keck Foundation, the Bill and Melinda Gates Foundation, and the M.J. Murdock Charitable Trust. Remcho is a *AAAS Fellow* (2014), *Oregon Scientist of the Year* (2015), *Keck Foundation Science & Engineering Program Awardee*, a *Milton Harris Research Award* recipient (2010), and is a recipient of the *College of Arts and Sciences Teaching Award* and the *Milton Harris Teaching Award* (2020). He and his student coauthors/inventors have over 100 publications and multiple patents. As Associate Dean (Research) and interim Dean in the College of Science, he led the teams that established the College's *Women in Science, Summer Undergraduate Research Experiences in Science,* and *Junior Faculty Mentoring* programs. He has served on the editorial boards for *Nanomaterials, Talanta* and *Electrophoresis.*

HADLEY D. SIKES, Associate Professor, Department of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA, USA

Hadley D. Sikes is the Esther and Harold E. Edgerton Associate Professor of Chemical Engineering at the Massachusetts Institute of Technology (MIT). She leads a team of researchers in the application of physical principles to design, synthesize, characterize and test molecules for utility in detecting and understanding disease. Hadley earned a B.S. at Tulane University, a Ph.D. at Stanford University, and was a postdoctoral scholar at the University of Colorado, Boulder, and the California Institute of Technology prior to joining the faculty at MIT.

Session Chairs and Scientific Organizers

LIANGLIANG SUN, Assistant Professor, Department of Chemistry, Michigan State University, East Lansing, MI, USA



Dr. Liangliang Sun is an Assistant Professor in the Department of Chemistry at Michigan State University. He joined MSU in 2016. Before that, he worked with Prof. Norman Dovichi at University of Notre Dame as a postdoctoral fellow and later a Research Assistant Professor (2011-2016). He received his Ph.D. degree in Analytical Chemistry in 2011 from Dalian Institute of Chemical Physics, Chinese Academy of Sciences, advised by Profs. Yukui Zhang and Lihua Zhang. The Sun group aims to develop novel analytical methodologies based on capillary electrophoresis-tandem mass spectrometry (CE-MS/MS) for multi-level proteomics to characterize proteins (bottom-up proteomics), proteoforms (top-down proteomics), and protein complexes (native proteomics) in cells globally with high throughput, high sensitivity, and single-cell resolution. They deploy the multi-level proteomics to address important questions in developmental biology and cancer biology. He has published 100 peer-reviewed papers, which have accumulated 2300 citations (h-index: 30. Web of Science). His research group at Michigan State University has published 25 papers in the last four years. He has been recognized as an Emerging Investigator by the Journal of the American Society for Mass Spectrometry and Analytical Methods. He received the National Science Foundation CAREER AWARD in 2019.

MYRIAM TAVERNA, Full Professor, Faculty of Pharmacy, University Paris Saclay, Institut Galien Paris Saclay, FRANCE

Myriam Taverna completed her Ph.D. in 1992 in analytical chemistry at the school of Pharmacy (Université Paris-Sud, France). In 2005 she was appointed full professor in analytical chemistry and biotechnology and is now senior member of the Institut Universitaire de France (IUF). She is director of "Institut Galien Paris-Saclay" composed of 7 research teams and head one of them strongly dedicated to the development of miniaturized analytical techniques for the analysis of peptides, protein being biotherapeutics, drug targets or biomarkers of pathologies. Her research expertise covers nanotechnologies, analytical microsystems, capillary electrophoresis and separation methods as well as their coupling to mass spectrometry. She has published over 160 international scientific papers in addition to a dozen of chapters. Her research work in the field of biomarkers of Alzheimer's disease led her to co-found in 2014 the start-up Alzohis.

BEATRIX UEBERHEIDE, Director of the Proteomics Laboratory and Associate Professor of Biochemistry and Molecular Pharmacology and Neurology, New York University Langone Health, New York, NY, USA

Beatrix Ueberheide is the Director of the Proteomics Laboratory and Associate Professor of Biochemistry and Molecular Pharmacology and Neurology at NYU Langone Health. She received her Ph.D. in Chemistry at the University of Virginia with an emphasis on the study of histone post translational modifications using classical 'Bottom Up' and 'Top Down' strategies under the guidance of Dr. Donald F. Hunt. She joined Rockefeller University for her postdoctoral training in the laboratory of Dr. Brian Chait where she developed *de novo* sequencing strategies for analysis of venom components and established techniques to study antibodies isolated from individuals. Research in the Ueberheide lab focuses on mass spectrometry-based techniques for a wide range of applications including quantitative proteomics, PTM characterization, epitope mapping, and the characterization of the proteome of neuropathological lesions and distinct cell types using the recently developed 'localized proteomics' - Laser Capture Microdissection (LCM) followed by label-free quantitative mass spectrometry (LC-MS).

LI ZANG, Director, Protein Analytics, Science and Technology, Operations, AbbVie Bioresearch Center, Inc., Worcester, MA, USA

Li is the director of Protein Analytics department at AbbVie Bioresearch Center, Worcester, MA and her group is responsible for analytical development CMC activities associated with AbbVie Biologics pipeline from discovery to commercialization. Li has more than 15-year experience in the biochemical, biophysical assay development, detailed protein structure characterization, analytical CMC program management as well as analytical regulatory filing for protein biologics. Li attended Northeastern University and received her Ph.D degree in Analytical Chemistry with Professor Barry L. Karger, specialized in development of novel separation methods and their application to breast cancer biomarker discovery. Li authored numerous scientific publications in peer-reviewed journals and gave many scientific presentations at international scientific conferences.

Confirmed Keynote Speakers

JOSE ALMIRALL, Professor, Department of Chemistry and Biochemistry, Director, Center for Advanced Research in Forensic Science; Director, Florida International University, Miami, FL, USA

José R. Almirall is a Professor in Chemistry and Biochemistry and Director of the NSF-funded Center for Advanced Research in Forensic Science (CARFS) at Florida International University. He was a practicing forensic scientist at the Miami-Dade Police Department Laboratory for 12 years, where he testified in over 100 criminal cases in state and federal courts prior to his academic appointment at FIU in 1998. His research interests include the development of methods for the sampling and preconcentration of VOCs associated with drugs and explosives. Prof. Almirall has authored more than 150 peer-reviewed publications in analytical and forensic chemistry. He has been awarded 6 patents based on micro-sampling and mentored more than 75 visiting scientists, postdoctoral fellows and graduate students. Prof. Almirall serves as the co-Editor-in-Chief of *Forensic Chemistry*, an Elsevier journal and was elected as a Fellow of the American Association for the Advancement of Science (AAAS) in 2020.

ERIN BAKER, Associate Professor, Department of Chemistry, North Carolina State University, Raleigh, NC, USA

Erin S. Baker is an Associate Professor at North Carolina State University in Raleigh, NC. To date, she has published over 130 peer-reviewed papers utilizing ion mobility spectrometry in conjunction with mass spectrometry (IMS-MS) to study both environmental and biological systems. Erin has served on the ASMS Board of Directors as the Member at Large for Education and is currently serving as the Vice President of Education for the International Lipidomics Society, Events Committee Chair for Females in Mass Spectrometry (FeMS) and as an Associate Director in the NCSU Comparative Medicine Institute. She is also an Associate Editor for the *Journal of the American Society for Mass Spectrometry* and on the Editorial Board of *Scientific Reports* and *Journal of Proteome Research*. She has received seven US patents, two R&D 100 Awards, been named to the Analytical Scientist 2019 Top 100 Power List, aided in the commercialization of the Agilent 6560 IMS-QTOF MS, and was a recipient of the 2016 ACS Rising Star Award for Top Midcareer Women Chemists. The Baker research group utilizes advanced separations, multi-omic analyses and big data assessments to drive innovative mass spectrometry technologies, systems biology evaluations, novel software capabilities and connections between human health and the environment.

FERNANDO BENAVENTE, Professor, Department of Chemical Engineering and Analytical Chemistry, Faculty of Chemistry, INSA·UB, University of Barcelona, Barcelona, SPAIN

Fernando Benavente is currently Full Professor in the Department of Chemical Engineering and Analytical Chemistry of the University of Barcelona (UB), member of the Nutrition and Food Safety Research Institute of the UB (INSA-UB) and leader of the group of Bioanalysis. He has also done doctoral and postdoctoral research at The RW Johnson Pharmaceutical Research Institute (USA), The National University of Rosario (Argentina), the University of Leiden (The Netherlands), The National University of La Plata (Argentina) and the University of Ottawa (Canada). His research is focused on the development and application of high-performance separation techniques coupled to mass spectrometry to solve complex analytical problems related to biomedicine, pharmaceuticals, food industry and forensic sciences. He is especially interested in the separation, the sensitivity enhancement, the characterization and the reproducibility of the analysis of peptides, proteins, glycoproteins, oligomeric proteins, metabolites, microRNAs and other bioactive compounds in biological samples, biopharmaceuticals and food using LC-MS, CE-MS and related techniques, as well as in the interpretation of the data with chemometrics tools. He is an expert in on-line SPE-CE-MS. His contributions include more than 100 international peer-reviewed publications, several book chapters and more than 150 presentations at national and international conferences. In 2014 the journal The Analytical Scientist included him in its 'top 40 under 40'.

MORAN BERCOVICI, Associate Professor, Faculty of Mechanical Engineering, and Faculty of Biomedical Engineering (by courtesy), Technion – Israel Institute of Technology, Haifa, ISRAEL

Moran Bercovici is an Associate Professor of Mechanical Engineering and Biomedical Engineering at Technion – Israel Institute of Technology. His lab combines experimental, analytical, and computational tools to study problems characterized by coupling between fluid mechanics, heat transfer, electric fields, chemical reactions, and biological processes. He is equally interested in understanding basic physical mechanisms and in leveraging them to create new tools and technologies across different disciplines. His current focus areas are in rapid prototyping, adaptive optics, microscale flow control, configurable microstructures, and lab-on-chip systems. Moran holds a Ph.D. in Aeronautics and Astronautics from Stanford University, worked as postdoctoral fellow at Stanford School of Medicine, and was a Harrington Faculty Fellow at the University of Texas at Austin. He authored and co-authored over 50 articles in top peer-reviewed journals, is the inventor of more than 20 patents, and is the recipient of several awards including the EU ERC Starting Grant, and the Blavatnik Prize – considered one of the most prestigious awards to young scientists in Israel.

JONATHAN BONES, Principal Investigator, Characterisation and Comparability Laboratory, The National Institute for Bioprocessing Research and Training, Dublin, IRELAND

Jonathan received his PhD in Analytical Chemistry from Dublin City University in 2007. Jonathan then moved to NIBRT - The National Institute for Bioprocessing Research and Training, working under the mentorship of Prof. Pauline M. Rudd within her GlycoScience Laboratory. In 2010, Jonathan was appointed the John Hatsopoulos Research Scholar within the Barnett Institute of Chemical and Biological Analysis at Northeastern University, Boston, working under the mentorship of Prof. Barry L. Karger. Jonathan returned to NIBRT in 2012 and is the Principal Investigator of the NIBRT Characterization and Comparability Laboratory and an Associate Professor in the School of Chemical and Bioprocess Engineering at University College Dublin

CHRISTOPH BORCHERS, Professor, Department Oncology, Faculty of Medicine, McGill University, Montreal, CANADA

Dr. Christoph Borchers is recognized as a pioneer and leading figure in the development of mass spectrometry-based methods for protein quantification using Multiple Reaction Monitoring (MRM). He has also published more than 300 peer-reviewed papers and is the founder and director of the McGill-Lady Davis Institute Integrated Proteomics Program at the Jewish General Hospital, McGill University, where he is currently a full professor in the Department of Oncology. Dr. Borchers received his Ph.D. degree from the University of Konstanz, Germany in 1996. After his post-doctoral training at the NIEHS/NIH/RTP, NC he became the director of the Duke–UNC Proteomics Facility and held a faculty position at the UNC Medical School in Chapel Hill, NC (2001-2006). From 2006 to 2019, he was a Professor in the Department of Biochemistry & Microbiology, and Director of the Genome BC Proteomics Centre at the University of Victoria, BC, Canada, where he held the Rix BC Leadership Chair in Biomedical and Environmental Proteomics. Dr. Borchers was also involved in promoting proteomics research and education through his involvement with HUPO (International Council Member), the British Columbia Proteomics Network (Executive Committee Member, past Scientific Director) and the Canadian National Proteomics Network (Member, past VP External and Chair of the Board of Directors). He is also a Fellow of the Canadian Academy of Health Sciences.

CHRISTINE CARAPITO, Senior Researcher, CNRS and University of Strasbourg, Strasbourg, FRANCE

Christine Carapito earned a Ph.D. in Analytical Chemistry from the University of Strasbourg under the guidance of Dr. Alain Van Dorsselaer focusing on the development of mass spectrometry-based proteomics and proteogenomics methods in 2006. After that, she joined the laboratory of Prof. Ruedi Aebersold at the Institute of Molecular Systems Biology at ETH Zurich as a post-doctoral fellow. There she developed MS detection methods for the characterization of post-translational modifications and participated in the human SRM Atlas project. In 2010, she became a permanent senior researcher of the French National Center for Scientific Research and the University of Strasbourg. Since then, she leads developments in functional and computational proteomics at the BioOrganic Mass Spectrometry laboratory. She supervised seven Ph.D. theses, is involved in teaching mass spectrometry and proteomics at the University of Strasbourg and holds editorial engagements. She has co-authored over 80 peer-reviewed articles. In 2018, she received the CNRS Bronze Medal and the award "Les Espoirs de l'Université de Strasbourg". She has been elected President of the French Proteomics Society from 2017 to 2020 and member of the European Proteomics Association Executive Committee in charge of Education since December 2020.

YI CHEN, Institute of Chemistry; Key Laboratory of Analytical Chemistry for Living Biosystems, Chinese Academy of Sciences (CAS), Beijing, CHINA

Dr. Chen obtained his degree of Ph.D. in 1990, and visited Max-Planck-Institute for Developmental Biology, German, as research fellows of Alexander von Humboldt Foundation and Max-Planck Society in 1992–1994 and 1996–1997, respectively, and University of California Berkeley, USA, as a visiting scholar in 2002–2004. He started to work on capillary electrophoresis in 1984, surface plasmon resonance imaging in 1997 and biological mass spectrometry in 2004, aiming at the analysis of bio-particles and bioactive compounds, with > 300 publications, 3 books and 35 patents. He won the Liang-Shu-Quan Award 2012 for basic research on analytical chemistry from Chinese Chemical Society (CCS), Young Scientist Award 2001 from CAS, Young Scholar Award 1999 from the Hong Kong Qiushi Science and Technology Foundation, and Young Chemist Award 1990 from CCS. He is also in the Editorial/Advisory Boards of 6 international and 10 Chinese journals, as a Deputy Editor of *Electrophoresis*, and Associate Editors of Chinese *J. Anal. Chem.*, and *Chinese J. Chromatogr.*. He is also elected Vice Presidents of 3 Chinese academic societies.

Confirmed Keynote Speakers

CHAO-MIN CHENG, Professor, Institute of Biomedical Engineering, National Tsing Hua University, TAIWAN

Chao-Min Cheng received his Ph.D. in 2009 from Carnegie Mellon University (Biomedical Engineering Department). He is currently a tenured professor at National Tsing Hua University, Taiwan, where he started in the summer of 2011, and recently has been selected as the Fellow of Royal Society of Chemistry. He has been blessed to receive "Ta-You Wu Memorial Award" and "Outstanding Research Award" from Taiwan's Ministry of Science and Technology. He was also an invited attendee for the NAS Sackler Colloquium at the National Academy of Sciences, and his research was highlighted in the National Academies–Keck Futures Initiative, Scientific American, Chemistry World, New York Times, and Lab on a Chip (along with a number of other media outlets). He has been currently an Associate Editor in Journal of Cellular and Molecular Medicine, and an Editorial Board Member in Sensor Letters, Diagnostics and Scientific Reports. He also has served as a consultant for biotechnologically relevant companies around the world with several Taiwan, U.S. and China patents granted.

DIONYSIOS CHRISTODOULEAS, Assistant Professor, Department of Chemistry, University of Massachusetts Lowell, Lowell, MA, USA

Dionysios Christodouleas is an Assistant Professor in the Department of Chemistry, University of Massachusetts Lowell. Before starting his independent career, he was a postdoctoral research associate in Harvard University working with Prof. George Whitesides. Prof. Christodouleas holds a Ph.D in Chemistry from University of Athens, Greece. His research group is working on the development of fully-integrated portable analytical devices (e.g., filter-like electrochemical cells), analytical methodologies (flow-through ELISA, sink/float magnetic immunoassays) and advanced materials (fluid-permeable electrodes, flexible thermoelectric materials) for sensing and energy applications. Thus far, he has published more than 34 papers in peer reviewed journals.

DOO SOO CHUNG, Professor, Department of Chemistry, Seoul National University, Seoul, SOUTH KOREA

Doo Soo Chung is a professor of analytical chemistry at the Department of Chemistry, Seoul National University, where he obtained a BS degree in 1981 and an MS degree in 1983 majoring in theoretical chemistry. Then he obtained an AM degree in physics in 1986 and a Ph.D. degree in 1991 in chemical physics at Harvard University, working on nonequilibrium liquid interfaces. During his postdoctroal researche at MIT and Harvard Medical School, Chung worked on biophysics. After being appointed as an assistant professor at Seoul National University, Chung got one year training in analytical chemistry at Iowa State University. Afterwards, he has been working on a variety of topics ranging from chemical physics to bioanalytical chemistry. His group has demonstrated molecule optics that controls the molecular motions by mechanical forces of light, especially optical force chromatography separating neutral molecules. Another major research area is to improve the sensitivity of capillary electrophoresis, especially by using in-line coupled microextraction techniques for sample cleanup and preconcentration. Few examples are single drop microextraction, in-tube microextraction, and single bubble microextraction.

A. SLOAN DEVLIN, Assistant Professor, Department of Biological Chemistry and Molecular Pharmacology, Harvard Medical School, Boston, MA, USA

Sloan Devlin is currently an Assistant Professor in the department of Biological Chemistry and Molecular Pharmacology at Harvard Medical School. She received her A.B. degree in chemistry from Harvard College in 2006, where she conducted research in organic chemistry in the laboratory of Andrew Myers. She earned her Ph.D. in chemistry in 2012 from Stanford University under the direction of Professor Justin Du Bois. Her graduate work focused on the total synthesis of the voltage-gated sodium ion channel agonist batrachotoxin as well as the development of novel organometallic C–H insertion methodology. In 2012, Sloan joined the lab of Professor Michael Fischbach at the University of California, San Francisco as a postdoctoral fellow. Her research in the Fischbach lab involved elucidating biosynthetic pathways and biological activities for small molecules produced by human-associated bacteria. Dr. Devlin joined the faculty at Harvard Medical School as an assistant professor in Fall 2016. The goal of the Devlin lab is to understand and control the chemistry of human-associated bacteria in the context of health and disease. Her lab is prioritizing the study of metabolites and the design of chemical probes that illuminate the molecular mechanisms by which the bacterial guests communicate with and affect their human host. Since launching her research group at Harvard Medical School, Dr. Devlin was named an Alfred P. Sloan fellow in Chemistry (2021) and has received an NIH R35 MIRA (Maximizing Investigators' Research Award) for Early Stage Investigators, a Karin Grunebaum Cancer Research Foundation Faculty Fellowship, a Roger Davis Investigator Award from the Kern Lipid Conference, and a John and Virginia Kaneb Junior Faculty Fellowship.

JOSÉ ALBERTO FRACASSI DA SILVA, Associate Professor, Department of Analytical Chemistry, Chemistry Institute, State University of Campinas, UNICAMP, Campinas, SP, BRAZIL

Jose Alberto Fracassi da Silva graduated in Chemistry from the Sao Paulo State University in 1996, where he also received his Ph.D. in Analytical Chemistry in 2001. This was followed by a postdoctoral position at the Laboratory of Integrated Systems, in Polytechnic School in the University of Sao Paulo. In 2004, he obtained a position at State University of Campinas (UNICAMP), in Campinas, São Paulo, Brazil. In 2010, he was a visiting scholar at The Ralph Adams Institute for Bioanalytical Chemistry, University of Kansas (USA). At present he is Associate Professor at Chemistry Institute and Associate Director at the Centre for Semiconductor Components and Nanotechnology, both at UNICAMP. His main research interests are focused on bioanalytical applications involving oxygen and nitrogen reactive species, instrumentation and methods for capillary electrophoresis, and microfabrication strategies and materials for lab on a chip microsystems and integrated sensors.

WEI GAO, Assistant Professor of Medical Engineering, Division of Engineering and Applied Science, California Institute of Technology, Pasadena, CA, USA

Wei Gao is an Assistant Professor of Medical Engineering in Division of Engineering and Applied Science at the California Institute of Technology. He received his Ph.D. in Chemical Engineering at University of California, San Diego in 2014 as a Jacobs Fellow and HHMI International Student Research Fellow (2012–2014). In 2014–2017, he was a postdoctoral fellow in the Department of Electrical Engineering and Computer Sciences at the University of California, Berkeley. He is a recipient of Sloan Research Fellowship (2021), IEEE EMBS Early Career Achievement Award, IEEE Sensor Council Technical Achievement Award, 3M Non-Tenured Faculty Award, MIT Technology Review 35 Innovators Under 35, and ACS DIC Young Investigator Award. He is a World Economic Forum Young Scientist (Class of 2020), a member of Global Young Academy (Class of 2019), and a 2020 Highly Cited Researcher (Web of Science). He is an Associate Editor of Science Advances. His research interests include wearable devices, biosensors, flexible electronics, micro/nanorobotics, and nanomedicine. For more information about Gao's research, visit www.gao.caltech.edu.

NORITADA KAJI, Professor, Department of Applied Chemistry, Kyushu University, Fukuoka, JAPAN

Dr. Noritada Kaji is a professor in the Department of Applied Chemistry at Kyushu University (Fukuoka, Japan). He obtained a Bachelor degree in Pharmaceutical Sciences in 2000 and Ph.D. degree in 2004 from the University of Tokushima, Japan. In his Ph.D. study, he developed Nanopillar Chips that were a state-of-the-art μTAS combined with nano-fabricated structures for DNA analysis. After his postdoctoral research, he started working as an assistant professor ofthe Department of Applied Chemistry at Nagoya University from February 2005. After 7 months work as a designated associate professor and a group leader of Engineering Technology Group of ERATO Higashiyama Live-Holonics Project in the Graduate School of Science at Nagoya University, he became an associate professor of the Department of Applied Chemistry at the same university. He was subsequently appointed as a professor at Kyushu University from 2018. His current research interests are development of a single molecule and a single cell analysis system on a chip combining ionic current detection and direct observation techniques, and environmental analysis system on a chip especially focusing on PM2.5 and microplastics.

RYAN T. KELLY, Associate Professor, Department of Chemistry and Biochemistry, Brigham Young University, Provo, UT, USA

Dr. Kelly is an Associate Professor in the Department of Chemistry and Biochemistry at Brigham Young University (BYU). He received his Ph.D. in analytical chemistry in 2005 from BYU and spent the next 13 years at Pacific Northwest National Laboratory where he began as a postdoc and ultimately served as Chief Technologist for the EMSL, a national scientific user facility. A central theme of Dr. Kelly's research has been the development of new technological solutions for improved biochemical analyses, including mass spectrometry based omics. Recent research efforts have focused on improved sample preparation, separations, ionization and mass spectrometry for single-cell and near-single-cell proteomics. Dr. Kelly has authored or coauthored more than 100 publications and is a named inventor on 14 issued and pending patents, several of which have been licensed and commercialized. His work has been recognized with several awards including two R&D 100 awards, a Federal Laboratory Consortium Award for Excellence in Technology Transfer, the Georges Guiochon HPLC Faculty Fellowship and the HTC Innovation Award.

Confirmed Keynote Speakers

KATHERINE W. KLINGER, Global Head of Translational Sciences, Sanofi R&D, Framingham, MA, USA

Dr. Klinger received her BA from Trinity University, San Antonio, TX and her Ph.D. in biochemistry at the University of Texas Health Science Center. Her postdoctoral fellowship was conducted at Case Western Reserve School of Medicine, Cleveland, Ohio. She joined Genzyme (via Integrated Genetics) in 1985. In addition to directing an active research program she established one of the first CLIA certified molecular testing laboratories which grew into Genzyme Genetics, now LabCorps. As Senior Vice President and Presidential Fellow at Genzyme she was responsible for building Genetics and Genomics capabilities. Dr. Klinger is ABMG certified in medical genetics and clinical molecular genetics and is a diplomate and fellow of the American College of Medical Genetics (ACMG). She has lectured nationally and internationally, is widely published in scientific journals and has written numerous book chapters. She serves on the boards of several educational and humanitarian foundations and has been active in the review process for the National Institutes of Health.

HIAN KEE LEE, Professor, Department of Chemistry, National University of Singapore, SINGAPORE

Hian Kee Lee is a Professor at the Department of Chemistry, National University of Singapore. His B.Sc. (Honours) and Ph.D. degrees are from the University of Canterbury, Christchurch, New Zealand. Professor Lee's research interests are in sample preparation, separation science and environmental analytics, specifically, the development and application of solvent-minimized microextraction procedures. Professor Lee was an editor of *Analytica Chimica Acta* from 2005 to 2011. He has also served as an editorial advisory board member of the *Journal of Chromatography A* (2003 to 2010), an editorial advisor for *Analytica Chimica Acta* (2003 to 2005), and an international advisory board member of the *Analyst* (1997 to 2008). He is a Fellow of the Royal Society of Chemistry, and the Academy of Sciences Malaysia. He is a recipient of his university's Outstanding Researcher Award (2006), the university's Faculty of Science Outstanding Scientist Award (2009), the Federation of Asian Chemical Societies Foundation Award (2009), and the Singapore National Institute of Chemistry Award in Environmental Chemistry (2013).

XINYU LIU, Associate Professor, Mechanical Engineering, Percy Edward Hart Professor of Mechanical & Industrial Engineering, University of Toronto, Toronto, CANADA

Xinyu Liu is an Associate Professor and the Percy Edward Hart Professor of Mechanical and Industrial Engineering at the University of Toronto. Prior to joining U of T, he was an Associate Professor and the Canada Research Chair in Microfluidics and BioMEMS in the Department of Mechanical Engineering at McGill University. He obtained his B.Eng. and M.Eng. from Harbin Institute of Technology in 2002 and 2004, respectively, and his Ph.D. from University of Toronto in 2009, all in Mechanical Engineering. He then completed an NSERC Postdoctoral Fellowship in the Department of Chemistry and Chemical Biology (with George Whitesides) at Harvard University in 2009–2011. At U of T, his research focuses on micro/nanofluidics, M/NEMS, and micro/nanorobotics, with applications in medicine and biology. He received the Canadian Rising Star in Global Health Award (2012), the Douglas R. Colton Metal for Research Excellence (2012), the McGill Christophe Pierre Award for Research Excellence (2017), the MINE Outstanding Young Researcher Award (2018), and 7 best paper awards at major engineering and biomedical conferences. He was named Fellow of the American Society of Mechanical Engineers (2021). He serves on the editorial boards of IEEE Transactions on Nanotechnology, IEEE Transactions on Automation Science and Engineering, IEEE Robotics & Automation Letters, IET Cyber-Systems and Robotics, and Journal of Advanced Robotic Systems.

NICOLLE (NICKI) PACKER, Distinguished Professor of Glycoproteomics, Interim Director, Australian Proteome Analysis Facility (APAF), Faculty of Science & Engineering, Macquarie University, Sydney, AUSTRALIA

Prof. Nicki Packer has had an extensive and varied research career in both Chemistry and Biological Sciences. She helped establish the Australian Proteome Analysis Facility (APAF) and co-founded Proteome Systems Ltd, a biotechnology company in which her group developed glycoanalytical technology and informatics tools. She has gained national and international recognition for her research in glycomics, using proteomics and bioinformatics approaches and linking it to biological functional research. Her current research is in the structure, function, informatics and application of glycans and their conjugates as molecular markers, focussing on their role in cancer, therapeutics and microbial infection. Nicki has published her research extensively and works closely with industry. She currently holds joint positions as Distinguished Professor of Glycoproteomics, deputy Director of the MQ Biomolecular Discovery Research Centre, Discovery Leader in the ARC Centres of NanoScale BioPhotonics and Synthetic Biology and Interim Academic Lead of APAF at Macquarie University, Sydney, Australia and as a Principal Research Leader at the Institute for Glycomics, Griffith University, Gold Coast, Queensland.

JAN PREISLER, Professor, Chemistry Department, Faculty of Science, Masaryk University, Brno, CZECH REPUBLIC

Jan Preisler received his Ph.D. in analytical chemistry at Iowa State University, Ames with Ed Yeung in 1996. After four years in the group of Barry Karger at Barnett Institute in Boston, he returned to his alma mater, Masaryk University in Brno, Czech Republic. Here he became an associate professor in 2007 and a full professor in 2014. His research interests include the development of instrumentation and methods for bioanalytical chemistry: mass spectrometry imaging, characterization of nanoparticles and their applications in analytical chemistry, time-of-flight mass spectrometers, and their off-line interfacing with microcolumn separation techniques, and capillary electrophoresis with laser-induced fluorescence detection. He pioneered application of kHz lasers to increase sample throughput of matrix-assisted laser desorption/ionization time-of-flight mass spectrometry. In the field of atomic spectrometry, he developed two new sample introduction techniques for inductively coupled plasma mass spectrometry. He enjoys teaching courses, such as Mass spectrometry of biomolecules or Molecular luminescence, promoting analytical science at the annual Schools of Mass Spectrometry in the Czech Republic, and supervising students. He currently serves on the editorial advisory board of Analytical Chemistry and chairs the Mass spectrometry section of the Czech Spectroscopic Society.

Confirmed Keynote Speakers

BRIAN C. SEARLE, Translational Research Fellow, Institute for Systems Biology, Seattle, WA, USA

Brian Searle is a Translational Research Fellow at the Institute for Systems Biology. Brian received his chemistry BA at Reed College in 2001. In 2004, he co-founded Proteome Software with Mark Turner and Dr. Ashley McCormack to produce and distribute cutting-edge data analysis software for proteomicists. In 2014, he returned to academia to earn his Ph.D. with Dr. Michael MacCoss at University of Washington, where he developed methods to detect and quantify proteins and phosphosites using mass spectrometry. In 2018, he joined the Institute for Systems Biology as an independent fellow to build a research program that spans the intersection of proteomics, mass spectrometry, bioinformatics, and technology development to study human genetic variation.

ALBERT SICKMANN, Professor, Leibniz Institute for Analytical Science, Dortmund, GERMANY

Albert Sickmann is the director of the Leibniz Institute for Analytical Sciences (ISAS e.V.) and head of the department "Bioanalytics". Furthermore, he is professor at the Ruhr-University Bochum (Faculty of Medicine) and the University of Aberdeen. His research interests are the highly complex signalling and metabolic pathways in cells and cell layers in the human body at different levels by developing and using techniques to measure signalling pathways with spatial and temporal resolution.

NIKOLAI SLAVOV, Assistant Professor, Bioengineering Department and Barnett Institute, Northeastern University, Boston, MA, USA

Nikolai Slavov's group seeks principles in the coordination among protein synthesis, metabolism, cell growth and differentiation. The Slavov group has pioneered high-throughput mass-spectrometry methods for quantifying proteins in single cells and is developing new computational methods for analyzing and understanding single-cell proteomics and multimodal data. The group obtained direct evidence for a new regulatory mechanism of protein synthesis (ribosome specialization) and continues to drive research in this emerging field supported by the NIH Director's New Innovator Award. Nikolai Slavov studied biology and physics at MIT before completing a dissertation at Princeton University (Botstein laboratory) with research focused on the coordination among metabolism, growth and gene expression. Dr. Slavov then returned to MIT (van Oudenaarden laboratory) for post-doctoral research that characterized trade-offs of aerobic glycolysis. Professor Slavov actively organizes community initiatives, such as the annual single-cell proteomics conference, which is a highly interactive and interdisciplinary meeting.

RUIJUN TIAN, Professor, Department of Chemistry, Southern University of Science and Technology (SUSTech), Shenzhen, Guangdong, CHINA

Dr. Ruijun Tian obtained his Ph.D. in analytical chemistry from Dalian Institute of Chemical Physics, Chinese Academy of Sciences in 2008 (Mentor: Dr. Hanfa Zou). He then moved to Canada for his postdoctoral training with Dr. Daniel Figeys at Ottawa Institute of Systems Biology, University of Ottawa (2008-2010) and Dr. Tony Pawson at Lunenfeld-Tanenbaum Research Institute, Mount Sinai Hospital and University of Toronto (2010-2014). He joined Department of Chemistry, Southern University of Science and Technology (SUSTech) in 2014 as an associate professor and was promoted as tenured full professor in 2020. His major research interest is precision medicine-oriented MS-based proteomics technology development and applications mainly in intercellular signaling of tumor microenvironment. He has published more than 70 research papers in Nature, PNAS, Angew Chem., Mol. Cell. Proteomics, Anal. Chem., etc. He received 2012 Young Investigator Award from International Association for Protein Structure Analysis and Proteomics (IAPSAP), Canadian Institutes of Health Research (CIHR) postdoctoral fellowship, and President's Scholarship from Chinese Academy of Sciences. He was the co-chairs for 2nd Young Investigator Symposium of CNHUPO and 5th China-Canada Systems Biology Symposium. He is the editorial board member for Chinese Journal of Chromatography (Young pannel) and Frontiers in Endocrinology.

HERMANN WÄTZIG, Professor, Institut für Medizinische und Pharmazeutische Chemie, Braunschweig, GERMANY

Prof. Dr. Hermann Wätzig studied pharmacy at the Freie Universität Berlin from 1981 to 1985. Ph.D. thesis 1989 about an HPLC topic, supervised by Prof. Dr. S. Ebel. From 1990 lecturer at the Institut für Pharmazie in Würzburg. Habilitation 1995. In 1999 appointment to a professorship in pharmaceutical chemistry at the Technical University of Braunschweig. Since 2001 chair of the division pharmaceutical analysis/quality control of the German Pharmaceutical Society. Scientific committee member of BfArM, CE Pharm and ISEAC. Associate Director of CASSS. Expert of the European Pharmacopoeia.Visiting Professor at Shizuoka Universität. Editor in chief of the journal Electrophoresis. Main research interests: instrumental analysis, especially capillary and gel electrophoresis, chromatographic techniques and mass spectroscopy. Analysis from body fluids. Analysis of biopolymers. Proteome research. Quality control. Quality assurance. Drugs from biotechnical production. Ligand binding assays, Metallomics, Validation. Statistics. Surface analysis. High resolution microscopy (REM, AFM, etc.).

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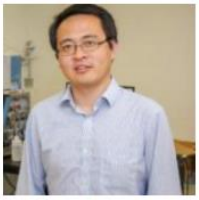
Oregon State University, USA

Hadley Sikes

Massachusetts Institute of Technology, USA



Liangliang Sun

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AbbVie Bioresearch Center, Inc., USA

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MSB 2021 Symposium Management

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Symposium History

Originally established as the ***International Symposium on High Performance Capillary Electrophoresis (HPCE)***, the first event was held April 10-12, 1989, at the Park Plaza Hotel in Boston, MA. The meeting was founded by Professor Barry Karger from Northeastern University. This first meeting featured presentations discussing the principles of separation in capillaries under high electrical fields, including instrumentation development and applications, particularly in biotechnology.

The HPCE symposium was introduced at the moment when capillary electrophoresis (CE) branched off from the HPLC community, giving the technology the necessary focus at a time when CE instrumentation was first being commercialized. The symposium series was driven by the Scientific Advisory Board (SAB) under its diligent chairman Barry Karger until 2000, followed by Frantisek Svec. The series was organized world-wide by Prof. Karger until 2000, and after that by CASSS in the USA, and by separate bodies in Europe and Asia.

At HPCE 2004 in Salzburg, the SAB changed the symposium name to ***MicroScale Bioseparations (MSB)***, since the attendees' interests expanded into the related techniques of micro- and nano-HPLC, microfluidic separations, and Lab-on-a-Chip applications, while the fascination with CE slowly decreased. The stylized logo was created at the same time, and captured the acronym MSB in a DNA helix motif given the prominent role that electrical driven microseparations have played in DNA sequencing and the early completion of the Human Genome Project. At MSB 2012 in Geneva, Switzerland, Beckman-Coulter established the prestigious Arnold O. Beckman Medal and Award for Outstanding Scientific Achievements in The Field of Electrodriven Separations Techniques which has become an essential element of the MSB series.

After the MSB 2012 symposium, the SAB changed. Not just by including new members, but especially by introducing new key concepts by which future meetings of the series will be organized. The symposium aims to create a confidential ambience with significant room for discussion and with over seventy percent of the program built from contributed abstracts using a blind review process. The board also changed its name to Strategic Program Committee (SPC). In order to further broaden the scope of the series to a wider range of scientists, the SPC approved the acronym of ***MSB*** to refer to ***Microscale Separations and Bioanalysis***. The new official conference name was used for the first time at MSB 2016 in Niagara-on-the-Lake, Canada, and has been used since.

In January 2018, the SPC took the bold step of creating an official, incorporated society with the goal of ensuring the longevity of the MSB symposium series. Previous members of the SPC now form the Board of Directors of the ***Society for Microscale Separations and Bioanalysis (SMSB)***.

Previous HPCE and MSB Meetings

More than 36 symposia have been held over the past 30 years in locations throughout the Americas, Europe and Asia

Year	Location	Chairperson(s)
2020	Saint-Malo, FR	Myriam Taverna, Serge Rudaz
2019	Corvallis, OR, USA	Vince Remcho, Karen Waldron
2018	Rio de Janeiro, BR	Marina Tavares, Emmanuel Carillho
2017	Noordwijkerhout, NL	Govert Somsen, Rawi Ramautar
2016	Niagara-on-the-Lake, CAN	Philip Britz-McKibbin, Karen Waldron, Sergey Krylov
2015	Shanghai, PRC	Amy Guo
2014	Pécs, HUN	Ferenc Kilár, Attila Felinger, András Guttman
2013	Charlottesville, VA, USA	Jeff D Chapman, James P Landers
2012	Geneva, CH	Franka Kalman, Gerard Rozing, Jean-Luc Veuthey
2012	Shanghai, PRC	Rong Zeng
2011	San Diego, CA, USA	Annelise E. Barron
2010	Prague, CZ	Frantisek Foret
2009	Boston, MA, USA	Jonathan V. Sweedler
2009	Dalian, PRC	Hanfa Zou
2008	Berlin, DE	Andreas Manz
2007	Vancouver, CAN	Robert Kennedy
2006	Amsterdam, NL	Gerard Rozing
2005	New Orleans, LA, USA	Michael Ramsey
2005	Kobe, JAP	Y. Baba, K. Otsuka
2004	Salzburg, AT	Wolfgang Lindner
2003	San Diego, CA, USA	Aran Paulus, Andras Guttman
2002	Stockholm, SWE	Douglas Westerlund
2001	Boston, MA, USA	Barry L. Karger, William S. Hancock
2000	Saarbrücken, DE	Heinz Engelhardt
1999	Palm Springs, CA, USA	Edward S. Yeung
1998	Orlando, FL, USA	Barry L. Karger, S. Fanali
1997	Anaheim, CA, USA	William S. Hancock
1997	Kyoto, JAP	Shigeru Terabe
1996	Orlando, FL, USA	Barry L.Karger
1995	Würzburg, DE	Hans Engelhardt
1994	San Diego, CA, USA	Shigeru Terabe
1993	Orlando, FL, USA	Barry L. Karger
1992	Amsterdam, NL	Frans Everaerts
1991	San Diego, CA, USA	James W. Jorgenson
1990	San Francisco, CA, USA	Barry L. Karger
1989	Boston, MA, USA	Barry L. Karger

MSB 2021 Program At-A-Glance

ON-DEMAND	At the conclusion of each session, each pre-recorded talk becomes available for viewing On-Demand. At the end of each day, live Q&A will become a part of each On-Demand talk. On-Demand will remain accessible on the conference platform for 30 days after the conference.	
****The Final Scientific Program and Book of Abstracts are located in the Resources tab in the top navigation bar of the conference platform*****		
All times EDT [CEST = EDT + 6 h, PDT = EDT - 3 h]		
Monday, July 12, 2021		
8:30-8:55am	**Opening Ceremony**	
8:55-9:30am	Introduction: Alexander Ivanov, Barnett Institute of Chemical and Biological Analysis, Northeastern University, USA **Founder's Lecture: Microscale Bioseparations and Analysis: A Look into the Past and the Future.** *Barry L. Karger, Northeastern University, Boston, MA, USA*	
9:30-10:10am	Introduction: Alexander Ivanov, Barnett Institute of Chemical and Biological Analysis, Northeastern University, USA **PLENARY 2: Robust and In-depth Work Flows for Single Cell and Clinical Proteomics.** *Matthias Mann, Max Planck Institute of Biochemistry, Planegg, GERMANY*	
10:10-10:25am	**eScience Café Break with Sponsored Videoclip**	
10:25-11:55am	**Monday Parallel Session 1: Analysis of Pharmaceutical Proteins and New Modalities of Biopharmaceuticals (Session sponsored by SCIEX)** Session Introduction: Li Zang, AbbVie Bioresearch Center, Inc. and Maggie A. Ostrowski, SCIEX	**Monday Parallel Session 2: Microscale Techniques in Forensic Analysis** Session Introduction: Adam Hall, Boston University School of Medicine
10:30-10:55am	**(KN) High Sensitivity Charge Variant Assessment of Biopharmaceuticals using ZipChip® Microchip Electrophoresis Coupled to Orbitrap Mass Spectrometry.** *Jonathan Bones, National Institute for Bioprocessing Research and Training, IRELAND*	**(KN) Improvements in Sampling and Detection of VOCs Associated with Drugs and Explosives using Capillary Microextraction.** *Jose Almirall, Florida International University, USA*
10:55-11:10am	**MicroFlow Size-exclusion Chromatography Enables Enhanced Native Mass Spectrometry of Proteins and Complexes.** *Andrea Gargano, University of Amsterdam, THE NETHERLANDS*	**(YS) A Biocompatible Solid Phase Microextraction and Direct Analysis in Real Time Mass Spectrometry Method to Detect Drugs of Abuse in Human Breast Milk.** *Emily Woods, Baylor University School of Medicine, USA*
11:10-11:25am	**Expanding Functional Antibody Characterization to Proteoforms: Affinity CE-MS to Study Antibody – FcRs Interactions.** *Elena Dominguez-Vega, Leiden University Medical Center, THE NETHERLANDS*	**(YS) Performance Evaluation of a Commercial Handheld Raman-spectrometer for Cocaine Detection in Street Samples.** *Joshka Verduin, Forensic Laboratory Dutch National Police Unit Amsterdam, University of Amsterdam, Amsterdam, THE NETHERLANDS*
11:25-11:40am	**(YS) Rapid Analysis of a Cysteine-linked Antibody-drug Conjugate by Liquid Chromatography Coupled to Fourier Transform Ion Cyclotron Resonance Mass Spectrometry.** *Eli Larson, University of Wisconsin-Madison, USA*	**(YS) Porous Thin Film: An Efficient Sampling Device and a Single use Electrospray Substrate for Rapid Extraction from Biofluid Spots and Direct Analysis with Mass Spectrometry.** *Ali Azizi, Memorial University of Newfoundland, CANADA*

11:40-11:55am	**(YS) Characterization of Bispecific T Cell Engager (BiTE) Antibody Fragmentation Sites using Capillary Electrophoresis Coupled to Mass Spectrometry (CE-MS).** *Arnik Shah, Amgen Inc., USA*	**Nanomanipulation-coupled to Nanospray Mass Spectrometry for the Analysis of Ultra-trace Forensic and Single Cell Chemical Determination.** *Guido Verbeck, University of North Texas, USA*
11:55am-12:10pm	**eScience Café Break with Sponsored Videoclip**	
12:10-12:55pm	**Monday Free Tutorial sponsored by AES Life Sciences** **Capillary Iso-Electric Focusing (CIEF) – Prime Methodology for Protein Characterization** *Presented by Gerard Rozing, Consultant with Advanced Electrophoresis Solutions*	**Monday Free eScience Café Seminar sponsored by PHENOMENEX** **Combining the Power of a Core-Shell Particles and Advanced Stationary Phase Selectivity to Improve Micro and Nano Flow Separations** *Presented by Jason A. Anspach, Phenomenex*
12:55-2:10pm	**Networking and Building Connections** **Vendor Booths in the Exhibit Hall** **Poster Session and Poster Pitches in the Poster Hall**	
2:10-2:50pm	Introduction: Kimberly Hamad-Schifferli, University of Massachusetts Boston, USA **PLENARY 3: Electrophoretic Cytometry: Single-cell and Sub-cellular Targeted Proteomics using Microfluidic Design.** *Amy Herr, University of California, Berkeley, CA, USA*	
2:50-4:35pm	**Monday Parallel Session-3: New Developments in Omics Technologies** Session Introduction: Rawi Ramautar, Leiden University	**Monday Parallel Session-4: Biomarker Discovery and Validation (Session sponsored by Agilent)** Session Introduction: James L. Edwards, Saint Louis University
2:55-3:20pm	**(KN) On-line Preconcentration by Solid-phase Extraction Capillary Electrophoresis-mass Spectrometry: A Simple Three-dimensional Tool for High-throughput and Sensitive Analysis of Biomarkers in Omics Research.** *Fernando Benavente, University of Barcelona, SPAIN*	**(KN) Development of Automated Multiplexed Assays for Cancer-related Proteins in Tumor Tissue Samples using Immuno-mass Spectrometry.** *Christoph Borchers, McGill University, CANADA*
3:20-3:35pm	**(YS) Profiling Acidic Metabolites by Capillary Electrophoresis-Mass Spectrometry in Low Numbers of Mammalian Cells using a Novel Chemical Derivatization Approach.** *Marlien van Mever, Leiden University, THE NETHERLANDS*	**Oxylipins as Early Markers of Cardiometabolic Health in Young Adults.** *Isabelle Kohler, Vrije Universiteit, THE NETHERLANDS*
3:35-3:50pm	**(YS) Ultrasensitive Capillary Electrophoresis Ion Mobility Mass Spectrometry for Targeted Peptidomics of Mouse Brain Tissue Regions.** *Kellen DeLaney, University of Maryland, USA*	**A Point-of-Care Suitable Assay for MicroRNA Detection and Quantitation using Liquid Biopsy Samples.** *Anastassia Kanavarioti, Yenos Analytical LLC, USA*
3:50-4:05pm	**(YS) Quantitative Nanoflow LC-MS/MS Enables High-dimension Chemoproteomic 'Library versus Library' Screening for Inhibitor Discovery against Endogenous DUB as an Emergent Target Class.** *Wai Cheung Chan, Harvard University, USA*	**(YS) Finding the Sweet Spot of Prostate-specific Antigen.** *Guinevere S.M. Lageveen-Kammeijer, Leiden University Medical Center, THE NETHERLANDS*
4:05-4:20pm	**(YS) Data-independent Acquisition for Ultrasensitive Proteomics using Capillary Electrophoresis-electrospray Ionization High-resolution Mass Spectrometry.** *Bowen Shen, University of Maryland, USA*	**Deep Steroidome Annotation Enables Fine Mechanistic Insights in Toxicology Risk Assessment.** *Víctor González-Ruiz, University of Geneva, SWITZERLAND*
4:20-4:35pm	**(YS) Large Scale Top-down Proteomics on Arabidopsis Leaf Proteins and Chloroplast.** *Qianjie Wang, Michigan State University, USA*	**MALDI MS Imaging of Carbon–carbon Double Bond Positional Isomers of Lipids Enabled by Off-line Reaction with Ozone.** *Antonín Bednařík, Masaryk University, CZECH REPUBLIC*
4:35-4:50pm	**eScience Café Break with Sponsored Videoclip**	
4:50-6:05pm	**Monday Parallel Session-5: Analysis of the Microbiome** Session Introduction: Liangliang Sun, Michigan State University	**Monday Parallel Session-6: Advancements in Ion Mobility Spectrometry and Gas Phase Separation-based Analytical Techniques (Session sponsored by MOBILion Systems, Inc.)** Session Introduction: Susan E. Abbatiello, Northeastern University
4:55-5;20pm	**(KN) Opportunities for Analytical Chemists in Human Microbiome Research.** *A. Sloan Devlin, Harvard Medical School, USA*	**(KN) Increasing the Throughput, Specificity and Confidence in Omic Analyses using Multidimensional Measurements.** *Erin Baker, North Carolina State University, USA*

5:20-5:35pm	**Electrophoretic Fractionation of Intact Microbes: A Preparative Method to Enhance Detection of Species within Complex Communities in Metagenomic Sequencing.** *Bonnie Jaskowski Huge, University of Notre Dame, USA*	**(YS) Establishing Native Trapped Ion Mobility Spectrometry of Biomolecules: How to Prevent System Potentials from Altering Protein Conformations.** *Hany Majeed, Vrije Universiteit Amsterdam, THE NETHERLANDS*
5:35-5:50pm	**Glycan Labeling-based Chemical Proteomics Strategy Enables Host and Pathogen Temporal Interaction Profiling (HAPTIP) in Nanoscale.** *Ying Zhang, Fudan University, CHINA*	**(YS) Development of a Portable Measuring Device for the Detection of Pollutants in Water on the Basis of Nano-liquid Chromatography and Ion Mobility Spectrometry.** *Tobias Werres, Institut für Energie- und Umwelttechnik e. V. and Leibniz University Hannover, GERMANY*
5:50-6:05pm		**(YS) PRM-LIVE with Trapped Ion Mobility Spectrometry and Its Application in Selectivity Profiling of Kinase Inhibitors.** *He Zhu, Dana-Farber Cancer Institute Brigham and Women's Hospital and Harvard Medical School, USA*

Tuesday, July 13, 2021

8:25-8:45am	**Tuesday Award Session for SCIEX Microscale Separations Innovations Medal and Award for Current and Breakthrough Research in the Field of Electrodriven Separations** Session Introduction: Jarrod Marto, Dana-Farber Cancer Institute, Brigham and Women's Hospital, Harvard Medical School, USA and Jörg Kutter, President of the Society for Microscale Separations and Bioanalysis, University of Copenhagen, DENMARK	
8:45-9:20am	**PLENARY 4 - Biosignatures, Electrophoresis, and the Search for Life Beyond Earth.** *Peter Willis, NASA Jet Propulsion Lab, CA Inst. of Technology, Pasadena, CA, USA*	
9:20-9:25am	**eScience Café Break with Sponsored Videoclip**	
9:25-10:55am	**Tuesday Parallel Session 7: Microfluidic Chip-based Electrophoresis. Fundamentals and Novel Applications** Session Introduction: Chengxi Cao, Shanghai Jiao Tong University	**Tuesday Parallel Session 8: Microsampling and Microscale Sample Preparation Techniques** Session Introduction: Tomasz Bączek, Professor, Medical University of Gdańsk
9:30-9:55am	**(KN) Surface Plasmon Resonance Imaging the Fingerprints via Chemical Composition.** *Yi Chen, Institute of Chemistry CAS, CHINA*	**(KN) Diffusion-based Separation and Extraction using Bidirectional Electroosmotic Flow.** *Moran Bercovici, Technion, ISRAEL*
9:55-10:10am	**Multiplex Detection of SARS-CoV-2 Variants of Concerns using ARMS-PCR on LabChip® GX Touch™ Nucleic Acid Analyzer.** *Zhi-xiang Lu, PerkinElmer Inc., USA*	**(YS) New Magnetic Bead-based Strategies for Extracellular Vesicle Isolation: Towards Microfluidic Droplet Operation.** *Marco Morani, Institut Galien Paris Saclay, FRANCE*
10:10-10:25am	**Asymmetric Peak Behaviour in Free-flow Counterflow Gradient Focusing.** *Matthew Courtney, University of Waterloo, CANADA*	**(YS) Extracellular Fluid Collection, Neurotransmitter, and Proteome Analysis of Drosophila Melanogaster Brain Tissue with Low-flow Push-pull Perfusion.** *Patrick Fisher, University of Illinois at Chicago, USA*
10:25-10:40am	**(YS) Micro-scale Concentration by Leading Electrolyte-free Conductive Wall Isotachophoresis.** *Steven Doria, Texas A&M University, USA*	**High-throughput Solid Phase Microextraction Method for Determination of Plasma Protein Binding.** *M. James Ross, MilliporeSigma, USA*
10:40-10:55am	**Non Aqueous Capillary Electrophoresis on Thiolene-based Microfluidic Devices with an Integrated Electrospray Interface.** *Jörg Kutter, University of Copenhagen, DENMARK*	**(YS) Combining In Vivo Microsampling with Capillary Electrophoresis High-Resolution Mass Spectrometry (CE-HRMS) Enabled Proteo-metabolomic Single-cell Systems Biology.** *Jie Li, University of Maryland College Park, USA*
10:55-11:00am	**eScience Café Break with Sponsored Videoclip**	
11:00am-12:30pm	**Tuesday Parallel Session 9: Single-Cell Analysis (Session sponsored by Bruker)** Session Introduction: Peter Nemes, University of Maryland, College Park and Tharan Srikumar, Bruker	**Tuesday Parallel Session 10: Biosensors and Bioaffinity Assays: Design and Development** Session Introduction: Hadley D. Sikes, Massachusetts Institute of Technology
11:05-11:30am	**(KN) Improved NanoLC Separations for Single-Cell Proteomics.** *Ryan Kelly, Brigham Young University, USA*	**(KN) Skin-interfaced Wearable Biosensors.** *Wei Gao, California Institute of Technology, USA*
11:30-11:45am	**High-throughput and High-efficiency Sample Preparation for Single-cell Proteomics using a Nested Nanowell Chip.** *Ying Zhu, Pacific Northwest National Laboratory, USA*	**Comparative Quantitative Analysis of Plasmonic Polymer Nanocomposites as Reliable Optical Sensing Platforms.** *Swarnapali De Silva Indrasekara, University of North Carolina Charlotte, USA*
11:45am-12:00pm	**(YS) Efficient Single Cell Proteomics Sample Preparation at High-throughput with Remarkable Sensitivity.** *Claudia Ctortecka, IMP, AUSTRIA*	**(YS) Comprehensive Online 2D-LC/MS Platform for Enzymatic Inhibitor Screening Assay: A Study of Conditions.** *Ananda Ferreira Pires, University of São Paulo, BRAZIL*

12:00-12:15pm	**(YS) Improved Sensitivity in Proteomic Profiling of Limited Samples using Novel MicroSPE-based Sample Preparation, Ultra-low Flow LC–MS, and FAIMS Interface.** *Michal Gregus, Barnett Institute of Chemical and Biological Analysis, Northeastern University, USA*	**(YS) Carbamazepine Detection in Whole Human Saliva using an Electrochemical Sensor with Stencil-printed Electrodes.** *Lael Wentland, Oregon State University, USA*
12:15-12:30pm	**(YS) Comparison of Photoactivatable Crosslinkers for In-gel Single-cell Immunoblotting.** *Kristine Tan, University of California, Berkeley, USA*	**Towards Rethinking Nanosafety: Quantitative Assessment of the Nanomaterial Metabolite Corona by Capillary Electrophoresis-Mass Spectrometry.** *Wei Zhang, Leiden University, THE NETHERLANDS*
12:30-12:35pm	**eScience Café Break with Sponsored Videoclip**	
12:35-1:20pm	**Tuesday Free eScience Café Seminar sponsored by VICI** **Microscale Separations at Nanoscale** *Presented by Jennifer Copeland, VICI*	**Tuesday Free eScience Café Seminar sponsored by MOBILion Systems** **Is Structures for Lossless Ion Manipulation (SLIM) a One Trick Pony or a One Stop Shop for Ion Mobility-Mass Spectrometry Analysis?** *Presented by Daniel DeBord, MOBILion Systems, Inc.*
1:20-2:35pm	**Networking and Building Connections** **Vendor Booths in the Exhibit Hall** **Poster Session and Poster Pitches in the Poster Hall**	
2:35-3:15pm	Session Introduction: Kimberly Hamad-Schifferli, University of Massachusetts Boston, USA **PLENARY 5: Organoids Microphysiological Analysis Platforms (MAP) and Exosome Detection via the Ultrafast-isolation System (EXODUS)** *Luke P. Lee, Harvard Medical School, Brigham Women's Hospital, Boston, MA, USA*	
3:15-4:45pm	**Tuesday Parallel Session 11: Microscale Techniques in Biopharmaceutical R&D** Session Introduction: Shujia (Daniel) Dai, Sanofi US	**Tuesday Parallel Session 12: New Applications and Developments in Electrodriven Separations** Session Introduction: Myriam Taverna, University Paris Saclay, Institut Galien Paris Saclay
3:20-3:45pm	**(KN) Micro-scale Technologies Empower Drug Discovery and Development.** *Katherine Klinger, Sanofi R&D, USA*	**(KN) Liquid Extraction Surface Analysis Coupled with Capillary Electrophoresis.** *Doo Soo Chung, Seoul National University, KOREA*
3:45-4:00pm	**(YS) Development of a Low-cost Nano ESI-MS Microfluidic Chip for Effective Mixtures and Detection of Biological Samples.** *Jéssica Freire Feitor, University of São Paulo, BRAZIL*	**Improved Biopharmaceutical Characterization Workflows for Next-Generation mAb-based Therapeutics.** *Jose-Luis Gallegos-Perez, SCIEX, USA*
4:00-4:15pm	**Pause**	**Rapid Serum Lipid Profiling by Multisegment Injection-nonaqueous Capillary Electrophoresis-Mass Spectrometry: Expanding Coverage Beyond Hydrophilic Metabolites.** *Philip Britz-Mckibbin, McMaster University, CANADA*
4:15-4:30pm	**(YS) Mono- and Disaccharide Monitoring in Cell Culture Medium by Capillary and Microchip Electrophoresis.** *Debbie van der Burg, Kantisto, THE NETHERLANDS*	**Capillary Zone Electrophoresis Top-Down Proteomics for In-depth Proteoform Characterization.** *Kevin Jooss, Northwestern University, USA*
4:30-4:45pm	**Capillary Gel Electrophoresis Characterization of New Modality Protein Therapeutics.** *Andras Guttman, University of Debrecen, HUNGARY*	**Capillary Electrophoresis Connected with Inorganic as well as Organic Mass Spectrometry for Separation of Enantiomers.** *Jan Petr, Palacky University Olomouc, CZECH REPUBLIC*
4:45-4:55pm	**eScience Café Break with Sponsored Videoclip**	
4:55-6:25pm	**Tuesday Parallel Session 13: Innovations in Microfluidic Systems** Session Introduction: Elain Fu, Oregon State University	**Tuesday Parallel Session 14: Advanced Instruments and Instrument Components** Session Introduction: Beatrix Ueberheide, New York University Langone Health
5:00-5:25pm	**(KN) Paper-based Microfluidic Biosensors for Viral and Serological Testing of COVID-19.** *Xinyu Liu, University of Toronto, CANADA*	**(KN) Towards Highly Reproducible, Time- and Cost-efficient Proteomics Sample Preparation of Larger Sample Cohorts.** *Albert Sickmann, Leibniz Institute for Analytical Sciences, GERMANY*
5:25-5:40pm	**(YS) An Immunoglobulin Bioassay Implemented in a Laser Patterned Multilamellar Device Comprised of Dissimilar Functional Materials.** *Saichon Sumantakul, Oregon State University, USA*	**Metal Ion Leaching of Common HPLC Hardware Substrates when Exposed to Pure Water, Methanol, and Acetonitrile and Its Impact on Separations.** *Jesse Bischof, SilcoTek Corporation, USA*
5:40-5:55pm	**(YS) Unraveling the Protective Mechanism of Biofluid Thin Films for use in Microsampling in Remote Settings.** *Benjamin Frey, The Ohio State University, USA*	**(YS) Orthogonal Solid-Phase Extraction-Contained-Electrospray Ionization Mass Spectrometry for Complex Lipid Mixture Analysis.** *Benjamin Burris, The Ohio State University, USA*

5:55-6:10pm	**Two-capillary Nanoflow Sheath Liquid Interface for CE-MS based on a 3D-printed Device.** *Christian Neusüß, Aalen University, GERMANY*	**Spray-capillary: A Novel Device for Microsampling and Online Capillary Electrophoresis Mass Spectrometry Analysis.** *Si Wu, University of Oklahoma, USA*
6:10-6:25pm	**(YS) Two in One: In Situ Hydrogel Formation in Microfluidics for One-step Competitive Assays.** *Marco Rocca, IBM Research Zurich, SWITZERLAND*	**Vibrating Sharp Edge Spray Ionization for Efficient and Flexible CE-MS Interfacing.** *Lisa Holland, West Virginia University, USA*
Wednesday, July 14, 2021		
8:40-9:20am	Session Introduction: Jarrod Marto, Dana-Farber Cancer Institute, Brigham and Women's Hospital, Harvard Medical School, USA **PLENARY 6: Proteomics 3.0: "Space" the New Frontier.** *John Yates, The Scripps Research Institute, La Jolla, CA, USA*	
9:20-9:25am	**eScience Café Break with Sponsored Videoclip**	
9:25-10:55am	**Wednesday Parallel Session 15: Fundamentals of Microscale Separation Techniques** Session Introduction: Rob Haselberg, Vrije Universiteit Amsterdam	**Wednesday Parallel Session 16: Nanoproteomics Technologies (Session sponsored by VICI)** Session Introduction: Yu Lu, McMaster University and Jennifer Copeland, VICI
9:30-9:55am	**(KN) Molecular Biophysics: Charge Interactions, CIEF and Affinity CE.** *Hermann Wätzig, University of Braunschweig, GERMANY*	**(KN) Integrated Proteomics Sample Preparation for Nanoscale Interactome Profiling.** *Ruijun Tian, Southern University of Science and Technology (SUSTech), CHINA*
9:55-10:10am	**(YS) Polyacrylamide Monoliths for Hydrophilic Interaction Chromatography Mass Spectrometry of Intact Proteins.** *Marta Passamonti, University of Amsterdam, THE NETHERLANDS*	**Highly Efficient Proteome and Phosphoproteome Capture and Analysis Procedure of Extracellular Vesicles from Urine and Plasma.** *Anton Iliuk, Tymora Analytical Operations, USA*
10:10-10:25am	**(YS) Determination of NSAIDS by Capillary Electrophoresis with Capacitively Coupled Contactless Conductivity Detection in Wastewater.** *Hanan Alatawi, UCC-Analytical Chemistry, IRELAND*	**Digital Microfluidics for Quantitative and Functional Low Cell Number Proteomics and Multi-omics.** *Andreas Tholey, Kiel University, GERMANY*
10:25-10:40am	**Native Capillary Electrophoresis-Mass Spectrometry of the Near 1 MDa Non-covalent GroEL/GroES/Substrate Protein Complexes.** *Anne-Lise Marie, Northeastern University, USA*	**Quantification of TMPRSS2-ERG Protein Isoforms in Prostate Cancer by Orthogonal Immunoaffinity-targeted Proteomics Assays.** *Andrei Drabovich, University of Alberta, CANADA*
10:40-10:55am	**(YS) Silylated Amino Acids as Hybrid Precursors for Protein-biomimetic Surface Coating: Application to Electrophoresis Separation.** *Jérémie Gouyon, Université de Montpellier, FRANCE*	**(YS) High Sensitivity Proteomic Profiling of Limited Samples by Capillary Electrophoresis Coupled to Electrospray Ionization Mass Spectrometry.** *Kendall Johnson, Barnett Institute of Chemical and Biological Analysis, Northeastern University, USA*
10:55-11:00am	**eScience Café Break with Sponsored Videoclip**	
11:00am-12:30pm	**Wednesday Parallel Session 17: Multidimensional Methods in Separations** Session Introduction: Andy High, St. Jude Children's Research Hospital	**Wednesday Parallel Session 18: Green Techniques for Microscale Sample Preparation and Analysis** Session Introduction: Jeongmi Lee, Sungkyunkwan University
11:05-11:30am	**(KN) Advanced Separation and Mass Spectrometry Methods to Characterize Host Cell Proteins in Biotherapeutics.** *Christine Carapito, CNRS Strasbourg University, FRANCE*	**(KN) Minimization of Organic Solvent Use in Sample Preparation and Extraction.** *Hian Kee Lee, National University of Singapore, SINGAPORE*
11:30-11:45am	**(YS) Peptide Mapping of Charge-based Separated Biotherapeutics by CZE-CZE-MS/MS.** *Johannes Schlecht, Aalen University, GERMANY*	**(YS) A Simple and Green Microscale Sample Preparation Method for Antibiotics Analysis via in situ Formation of Hydrophobic Eutectic Solvents in Surface Water.** *Ke Li, Sungkyunkwan University, SOUTH KOREA*
11:45am-12:00pm	**(YS) Charge-based Fractionation of Blood Plasma-derived Extracellular Vesicle Subpopulations for Proteomics Profiling.** *Xianyi Su, Northeastern University, USA*	**Application of Novel Microsampling Approach based on SPME Probes for Monitoring Age- and Gender-related Alterations in the Level of Endocannabinoids in Brain Samples.** *Anna Roszkowska, Medical University of Gdańsk, POLAND*
12:00-12:15pm	**(YS) Deterministic iDEP Ratchet Devices for High-throughput Organelle Separation.** *Domin Koh, Center for Applied Structural Discovery (CASD), USA*	**Sample Preparation Carried out by 3D-printed Sorbents – Opportunities and Challenges in View of Miniaturization and Environmental Impact.** *Mariusz Belka, Medical University of Gdańsk, POLAND*
12:15-12:30pm	**(YS) Top-down Proteomics of Complex Protein Samples using Online 2D High-pH/Low-pH Ultra High-pressure Nano-RPLC-MS.** *Dahang Yu, University of Oklahoma, USA*	

12:30-12:35pm	**eScience Café Break with Sponsored Videoclip**	
12:35-1:20pm	**Wednesday Free eScience Café Seminar sponsored by BRUKER** **Latest Applications of 4D-Proteomics using Trapped Ion Mobility on the timsTOF Pro 2** Presented by Gary Kruppa **4D Proteomics – Dissecting the 3D Structure of Proteins through Ion Mobility Enhanced Crosslinking Mass Spectrometry** Presented by Richard Scheltema	**Wednesday Free eScience Café Seminar sponsored by SCIEX** **Comprehensive, 15-min Charge Variant Analysis of Biotherapeutics with a Microfluidic Chip-Based Integrated iCIEF-MS System** Presented by Maggie A. Ostrowski, Intabio, now part of SCIEX
1:20-2:35pm	**Networking and Building Connections** **Vendor Booths in the Exhibit Hall** **Poster Session and Poster Pitches in the Poster Hall**	
2:35-3:15pm	Session Introduction: Alexander Ivanov, Barnett Institute of Chemical and Biological Analysis, Northeastern University, USA **Wednesday Award Session for Thermo Fisher Scientific Early Career Award for Breakthrough Research Advancing the Field of Microscale Separations and Bioanalysis** **PLENARY 7: Leveraging Capillary Electrophoresis-Mass Spectrometry for Multi-level Proteomics.** *Liangliang Sun, Michigan State University, East Lansing, MI, USA*	
3:15-4:45pm	**Wednesday Parallel Session 19: Single-Particle Assays: Single Molecules to Single Cells** Session Introduction: Stephen C. Jacobson, Indiana University	**Wednesday Parallel Session 20: Innovation in Microfluidics, Point-of-care Devices, Precision Medicine** Session Introduction: Takehiko Kitamori, National Tsing Hua University
3:20-3:45pm	**(KN) A Single Cell Mechanical Assay on a Chip.** *Noritada Kaji, Kyushu University, JAPAN*	**(KN) IL-6 Diagnostic Device for COVID-19 and Its Clinical Validations.** *Chao-Min Cheng, National Tsing Hua University, TAIWAN*
3:45-4:00pm	**Stiffness of Single Apoptotic Bodies to Inform Brain Cancer Therapeutics.** *Joanna Dahl, University of Massachusetts Boston, USA*	**(YS) Ultrasensitive and Label-free Fluorescent Nanobiosensor for the Detection of miRNA in Breast Cancer Progression.** *Zheng Wei Wong, University of Nottingham Malaysia, MALAYSIA*
4:00-4:15pm	**(YS) Increasing the Purity of Extracellular Vesicle Isolation from Blood Plasma using Multi-mode Chromatography Techniques.** *Alan Zimmerman, Barnett Institute of Chemical and Biological Analysis, Northeastern University, USA*	**Automation of Solid Phase Extraction for Peptide Desalting by Centrifugal Microfluidics.** *Jan-Niklas Klatt, University of Freiburg, GERMANY*
4:15-4:30pm	**(YS) Microfluidic Fractionation: A New Approach to Study Heterogeneous Yeast Cultures.** *Sebastian Schwaminger, Massachusetts Institute of Technology, USA*	**Quantification of Metalloprotein Biomarkers in Human Blood Plasma.** *Juergen Gailer, University of Calgary, CANADA*
4:30-4:45pm	**Size-Exclusion Chromatography Shows that Lipid Nanoparticles Acquire Lipoproteins from HDL.** *Rositsa Koleva, Moderna, USA*	**Epitachophoresis – Theoretical and Practical Considerations.** *Frantisek Foret, Institute of Analytical Chemistry, CZECH REPUBLIC*
4:45-4:55pm	**eScience Café Break with Sponsored Videoclip**	
4:55-6:25pm	**Wednesday Parallel Session 21: Advancements in Miniaturized Sample Preparation Techniques** Session Introduction: Ryan T. Kelly, Brigham Young University	**Wednesday Parallel Session 22: Novel and Advanced Approaches and Hardware Solutions for Enabling Microscale Bioseparations and Microanalysis** Session Introduction: Frantisek Foret, Institute of Analytical Chemistry
5:00-5:25pm	**(KN) Droplet Sample Preparation for Single-cell Proteomics Applied to the Cell Cycle.** *Nikolai Slavov, Barnett Institute, USA*	**(KN) Multimodal Imaging of 3D Cell Aggregates.** *Jan Preisler, Masaryk University, CZECH REPUBLIC*
5:25-5:40pm	**Advanced 3D Printing for Microfluidics.** *Gregory Nordin, Brigham Young University, USA*	**(YS) Development of a Micro-LC-MS/MS Method for Quantitative Analysis of Endocannabinoids and Related N-acylethanolamines in Human Cerebrospinal Fluid.** *Bingshu He, Leiden University, THE NETHERLANDS*
5:40-5:55pm	**Ultrasensitive Top-down Proteomics based on a Nanodroplet Sample Processing Platform.** *Mowei Zhou, Pacific Northwest National Laboratory, USA*	**(YS) High Throughput Analysis and Ultra-small Volume Detection of Biological Samples using Droplet Imbibition Mass Spectrometry.** *Taghi Sahraeian, The Ohio State University, USA*
5:55-6:10pm	**(YS) A Capillary Flow-based Sample Preparation System for Metabolomic Sample Preparation of Mammalian Cells in Suspension.** *John Coulton, Saint Louis University, USA*	**A 3-D Printed Sheath Flow Cuvette for Capillary Array Detection.** *Cameron Skinner, Concordia University, CANADA*
6:10-6:25pm	**Development of New Disposable Pipette Extraction Sorbents for Clinical Purposes.** *Andrea Chaves, Universidade Federal de Goiás, BRAZIL*	**(YS) High-resolution 3D-printed Insulator-based Dielectrophoresis Devices Towards Manipulation of Bioanalytes.** *Mukul Sonker, Arizona State University, USA*

Thursday, July 15, 2021

8:40-9:20am	Session Introduction: Kimberly Hamad-Schifferli, University of Massachusetts Boston, USA **PLENARY 8: Microfluidic Sorting of Extremely Rare Circulating Tumor Cells and Clusters from Blood** *Mehmet Toner, Massachusetts General Hospital and Harvard Medical School, Harvard-MIT Health Sciences and Technology, Boston, MA, USA*	
9:20-9:25am	**eScience Café Break with Sponsored Videoclip**	
9:25-10:55am	**Thursday Parallel Session 23: Novel Informatics and Software Approaches for Enabling Bioseparations and Microanalysis** Session Introduction: Oleg V. Krokhin, University of Manitoba and Darien Yeung, Manitoba Centre for Proteomics and Systems Biology	**Thursday Parallel Session 24: Micro-Analytical Systems for Point-of-Care Disease Diagnosis** Session Introduction: Abraham Badu-Tawiah, The Ohio State University
9:30-9:55am	**(KN) Bioinformatic Methods to Leverage High Quality Retention Time Libraries in Proteomics.** *Brian C. Searle, The Ohio State University, USA*	**(KN) Flow-through Sensors for Chemical and Biochemical Analysis in the Field.** *Dionysios Christodouleas, University of Massachusetts Lowell, USA*
9:55-10:10am	**(YS) Unique Computational Perspectives of Terminal Residue Effects on Peptide Retention Properties.** *Darien Yeung, Manitoba Centre for Proteomics and Systems Biology, CANADA*	**Quantitative Analysis of Virus Like Particle Separation using Insulator-based Gradient Dielectrophoresis.** *David Charlot, Arizona State University, USA*
10:10-10:25am	**(YS) MS-based Molecular Networking Strategy for Drug Metabolite Identification: In Case of Sildenafil In Vitro Metabolism Study.** *Jun Sang Yu, Hanyang University, SOUTH KOREA*	**Open-source Mass Spectrometry for Clinical Applications.** *Abraham Badu-Tawiah, Ohio State University, USA*
10:25-10:40am	**(YS) A New Open-source and User-friendly Tool for Accurate and Automated Baseline Correction in Capillary Electrophoresis.** *Tijmen S. Bos, Vrije Universiteit Amsterdam, THE NETHERLANDS*	**(YS) Large-scale Top-down Proteomics of Human Colorectal Cancer Cell Lines using Capillary Zone Electrophoresis-Tandem Mass Spectrometry.** *Elijah McCool, Michigan State University, USA*
10:40-10:55am	**(YS) Development of Data Analysis and Software Approaches to Improve the Sensitivity of Mass Spectrometry-based Thermal Shift Assays (MS-TSA) for Target Engagement and Drug Discovery.** *Amanda Figueroa-Navedo, Barnett Institute of Chemical and Biological Analysis, Northeastern University, USA*	**Thermal Denaturation Proteolysis for Viral Capsid Protein Structural Analysis.** *Estee Toole, Thermo Fisher Scientific, USA*
10:55-11:00am	**eScience Café Break with Sponsored Videoclip**	
11:00am-12:30pm	**Thursday Parallel Session 25: Glycomic and (Glyco)Proteomic Applications to Address Unsolved Biomedical Question** Session Introduction: Guinevere S.M. Lagveen-Kammeijer, Leiden University Medical Center	**Thursday Parallel Session 26: Biosensors and Actuators: Instruments, Components and Applications** Session Introduction: Vincent Remcho, Oregon State University
11:05-11:30am	**(KN) Multi-glycomics Discovery.** *Nicolle Packer, Macquarie University, AUSTRALIA*	**(KN) 3D Printing as a Powerful Tool for the Production of Low-cost Microfluidic Devices.** *José Alberto Fracassi Da Silva, State University of Campinas, UNICAMP, BRAZIL*
11:30-11:45am	**(YS) Monolith O-glycosidase Microreactor for Efficient O-glycan Release.** *Bin Yang, Université Paris-Saclay CNRS Institut Galien Paris Saclay, FRANCE*	**(YS) Fabrication of Hydrogels for the Recognition of Specified Proteins via Grafting Molecularly Imprinted Polymers.** *Chenchen Liu, Kyoto University, JAPAN*
11:45am-12:00pm	**(YS) Alterations in Protein Expression and Site-specific N-glycosylation of Prostate Cancer Tissues.** *Simon Sugár, Eötvös Loránd Research Network, HUNGARY*	**(YS) Novel Strategies for Elucidation of the Interaction between Functionalized Magnetic Beads and Pharmaceutical and Diagnostic Molecules.** *Ngoc-Van-Thanh Nguyen, Institut Galien Paris-Saclay, FRANCE*
12:00-12:15pm	**(YS) Combined PGC LC-MS/MS and mRNA Expression Analyses in AML Cells Delineates Differential GSL-Glycan Signatures.** *Di Wang, Leiden University Medical Center, THE NETHERLANDS*	**(YS) Nucleic Acid Amplification using Radio Frequency Electrokinetic Heating.** *Jarad Yost, Texas A&M University, USA*
12:15-12:30pm	**(YS) Dopant-enriched Nitrogen Gas for Enhanced Electrospray Ionization of Released Glycans in Negative Ion Mode.** *Katarina Madunic, Leiden University Medical Center, THE NETHERLANDS*	**Nitrogen-doped Carbon Dots Aid Electrokinetic Separations of ssDNA Molecules.** *Christa Colyer, Wake Forest University, USA*
12:30-12:35pm	**eScience Café Break with Sponsored Videoclip**	

12:35-1:20pm	**Thursday Free eScience Café Seminar sponsored by AGILENT** **Advancing Denaturing and Native Top-down Proteomics Analysis using CE-MS** Presented by Liangliang Sun, Michigan State University	
1:20-2:35pm	**Networking and Building Connections** **Vendor Booths in the Exhibit Hall** **Poster Session and Poster Pitches in the Poster Hall**	
2:35-3:15pm	Session Introduction: Jarrod Marto, Dana-Farber Cancer Institute, Brigham and Women's Hospital, Harvard Medical School, USA **PLENARY 9: Toward Universal Druggability.** *Gregory Verdine, FogPharma, Cambridge, MA, USA*	
3:15-4:25pm	**Thursday Parallel Session 27: Celebrating the Greater Boston and Massachusetts Life Science Industry** Session Introduction: Paola Castaldi, LifeMine Therapeutics	**Thursday Parallel Session 28: Additional Young Scientists Orals in Competition for the 2021 MSB Young Scientist Award (Session sponsored by Dana-Farber Cancer Institute)** 3:20pm Session Introduction
3:25-3:40pm	**Experimental Strategies to Improve Target Identification in Mass Spectrometry-based Thermal Stability Assays.** *Clifford Phaneuf, Sanofi, USA*	**(YS) Rapid In-gel Protein Detection from Highly-integrated Single-cell Immunoassays by Electrotransfer Probing.** *Andoni Mourdoukoutas, University of California Berkeley, USA*
3:40-3:55pm	**Complementary Chemoproteomic Workflows: Applications of Chemoproteomics in Target Identification and Drug Discovery.** *Francisco Garcia, Novartis Institutes for BioMedical Research, USA*	**(YS) Droplet Microfluidic Technology for the Early and Label-free Isolation of Activated T-cells.** *Claudia Zielke, Santa Clara University, USA*
3:55-4:10pm	**Development of a Novel Automated, High-Throughput, Plasma Protein Biomarker Enrichment Protocol.** *Ulrich Thomann, Covaris Inc., USA*	**(YS) Novel Water-compatible Type of Stationary Phase for Thin-film Microextraction (TFME) of Small Molecules from Aqueous Samples.** *Lukasz Sobczak, Nicolaus Copernicus University Toruń, POLAND*
4:10-4:25pm	**Development of a Broad Spectrum, Vinyl Sulfonate-based Activity-based Probe for SHP2.** *Wankyu Lee, Dewpoint Therapeutics, USA*	**(YS) Isotope Encoded Derivatization of Endothelial Cell Lysates for Nine-plex Quantitation of Aldehyde Metabolites using nESI-LC-HRMS.** *Michael Armbruster, Saint Louis University, USA*
4:25-4:40pm	**eScience Café Break with Sponsored Videoclip**	
4:40-5:30pm	**Thursday Closing Session: Awards and Final Remarks** Presentation of Young Scientist (YS) Oral Presentation Award Presentation of Best Poster Awards Invitation to MSB 2022 – April 3-6, 2022, Liege, Belgium Closing Session and Final Remarks	