38th International Symposium on Microscale Separations and Bioanalysis (MSB2022)

The 38th International Symposium on Microscale Separations and Bioanalysis (MSB2022) was organized by Profs. Marianne Fillet (University of Liege, Belgium) and Heidi Ottevaere (Vrije Universiteit Brussel, VUB, Belgium) in Liège (Belgium) from July 3 to 6, 2022. MSB covers aspects related to all major microscale separation techniques including capillary electrophoresis (CE), nano- and micro-liquid chromatography (LC) and microfluidics, as well as applications related to pharmaceutical sciences, biotechnology, clinical and forensic toxicology, omics techniques, food analysis, etc. MSB provides the opportunity to discuss unpublished work, while abstracts are selected through double-blind peer review to encourage the participation of young and renowned researchers. One-third of the session time is dedicated to questions from attendees to stimulate debate and discussion.

On Sunday morning, we started with two sessions of three parallel pre-symposium short courses taught by world leaders in their field of expertise. In the first session, Prof. Gert Desmet (VUB, Belgium) discussed the concept, possibilities and applications of micro-pillar array columns. In parallel, Prof. Heidi Ottevaere and Dr. Tatevik Chalyan (VUB, Belgium) gave an introduction to biosensors. Simultaneously, Prof. Rawi Ramautar (Leiden University, the Netherlands) presented recent advances and applications in metabolomics using CE, a microscale separation technique particularly suitable for the analysis of polar and charged compounds in very limited sample volumes. In the second session, Prof. Stig Pedersen-Bjergaard (University of Oslo, Norway) discussed liquid-phase microextraction and electromembrane microextraction as future techniques for green sample preparation in analytical chemistry. In parallel, Prof. Serge Rudaz and Dr. Victor González-Ruiz (University of Geneva, Switzerland) provided an update on the latest developments and trends in mass spectrometry-based quantitative approaches and method validation, with a focus on their innovations and advantages compared to classical methodologies. Simultaneously, Prof. Wim De Malsche and Dr. Pierre Gelin (VUB, Belgium) discussed active lateral flow methods based on electroosmotic and acoustic principles to reduce slow diffusive lateral mass transport, thus minimizing the impact of the flow rate, for fast, high-quality separations.

On Sunday afternoon, after a warm welcome from the organizers, the opening session of the symposium included two plenary lectures. The first one by Prof. Justin LP Benesch (University of Oxford, United Kingdom) who discussed on "Separating Ultra-Heterogenous Protein Assemblies by Mass Photometry and Native Mass Spectrometry" and the second by Prof. Petra S. Dittrich (ETH Zurich, Switzerland) who introduced droplet microfluidics for multimodal high throughput analysis of cells and chemical compounds in nanoliter volumes. Afterwards, attendees could enjoy a welcome reception.

On Monday, 1 plenary, 5 keynote and 14 oral communications were presented. The session "Microfluidic Platforms for Integrated Separation and Detection & Microscale Sample Preparation for Bioanalysis" began with a plenary lecture by Dr. Olivier Frey (InSphero AG, Switzerland) on multi-tissue microphysiological systems interconnecting several organ models, such as 3D spherical microtissues, through microfluidic technology allowing investigating the effects of compounds in a more systemic, *in vivo*-like fashion. Before lunch, 10 poster pitches allowed young researchers to explain their results in a short time, and then everyone was invited to view the posters on display. After lunch, four sessions took place: "New Trends in MS and IMS for Bioanalysis", "Microfluidic Platforms", "Nanoscale Separation Systems for Interaction Studies" and "Sensor Fabrication Technologies". In the evening, a Young Scientists' Event for PhD students and postdocs was organized at La Grand Poste, a unique venue that brings together different culinary artisans.

On Tuesday, 3 keynote and 10 oral communications were presented in the sessions “Pharma and Biopharma Applications”, “Intact and Native Protein Analysis” and “Microfluidics: from Droplets Towards Single Cells”. Between sessions, 10 more poster pitches were presented. In the afternoon, Prof. James Landers (University of Virginia, USA) received the Sciex Innovation Award for his work on microfluidics toolkits and presented a microdevice capable of DNA extraction, amplification, electrophoresis and fluorescence detection applicable to clinical diagnostics for SARS-CoV-2 detection. In the evening, a walking tour of the city centre of Liege was organized followed by the banquet on the boat "Le Pays de Liège", which sailed from the Quai Édouard Van Beneden and crossed the Meuse river.

On Wednesday, 1 plenary, 6 keynote and 13 oral communications were presented in the sessions “Biomarkers for Precision Medicines”, “Point-of-Care Devices/from Lab-on-Chip Systems Towards Applications”, “Microscale Separations for –Omics Sciences” and “Advances in Microscale CE and LC Separations”, in which I presented on-line aptamer affinity solid-phase extraction-immobilized enzyme microreactor-CE-MS for the sensitive and valve-free targeted bottom-up analysis of protein biomarkers. In the last session entitled “Biomarkers and Functionalisation”, Prof. Erin S. Baker (NC State University, USA) presented metabolomics pipelines to investigate features from untargeted studies using LC-IMS-MS/MS. At the closing ceremony, the poster and oral communication awards for young scientists were announced. The conference concluded with the announcement of MSB2023 in Tallahasse (USA).

I am very grateful for the opportunity to participate in MSB2022 and would like to acknowledge SECyTA for the travel support.

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