

Proceedings of APCE-CECE-ITP-IUPAC 2022

"... bringing people and ideas together ..."

November 6–10 2022, Angkor Wat, Cambodia

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Foreword

Modern analytical chemistry at its best.

Welcome to APCE-CECE-ITP-IUPAC 2022, the International Interdisciplinary Conference of Chemical Analysis. After two years of Covid-19-related delays, we are finally meeting in person in Siem Reap, Cambodia. From the joint APCE-CECE meeting originally planned for 2020, we have grown into a quadruple meeting including:

18th Asia Pacific International Symposium on Microscale Separations and Analyses,
17th International Interdisciplinary Meeting on Bioanalysis,
28th International Symposium on Electro- and Liquid Phase-Separation Techniques
IUPAC Special Symposia by Division of Chemistry and the Environment.

While, under normal circumstances, these conferences would take place in different countries, we have decided to bring together analytical chemists from all over the world for a conference covering all aspects of modern analytical chemistry. Our goal remains the same: “bring together scientists from different disciplines who may not meet at other meetings”. With plenary and invited lectures delivered by distinguished scientists, we are sure to broaden our knowledge, meet new friends, and start new collaborations. The organizers want to thank all speakers, sponsors, and participants for their continuing support. Please, check our web at www.ce-ce.org for more information about the history, programs, photos, and videos.

The conference's permanent board members agreed on the magnificent Angkor Wat as the location for this year's conference.



Brno



Seoul

October 22, 2022

The Jaroslav Janák Award

The Jaroslav Janák Award for contributions to the development of analytical sciences was established by the Institute of Analytical Chemistry. Named after the inventor of the gas chromatograph (patented in 1952), founder of the institute (1956) and its long-term director, the medal is awarded to scientists who have significantly contributed to the development of separation sciences.



In 2022 the Jaroslav Janák Award goes to **Dr. Martin Gilar**.



Dr. Gilar (*1966) received his Ph.D. in analytical chemistry from Institute of Chemical Technology in Prague (1996). He spent postdoc years in Hybridon Inc. (1996-1998) and Northeastern University in Boston (1998) developing separation methods for antisense oligonucleotides and fraction collector for DNA molecules. Since 1998 he has worked at Waters Corp. in Milford, Massachusetts, participating in column, sample preparation and instrument research.

Dr. Martin Gilar is a Scientific Fellow in the Separations R&D group at Waters Corporation. He has more than 30 years of experience in the separation sciences, including chromatography, electrophoresis, and mass spectrometry. His research interest is the analysis of biopolymers, peptides, and nucleic acids. He has published over 80 peer reviewed papers including several patents. He is a recipient of Chromatographic Society Jubilee medal in 2022.

František Foret

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Software



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Registered Patent

KR10-2156728, KR10-2200510

Product Specification

Carrier Gas	Helium Cylinder
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Limit of Detection	Lower ppb range
Analysis Time (BTEX)	< 10 minute
GC Column	SPB®-1 Capillary GC Column, L15m x ID0.25 mm, df1.0 µm
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Top tips for discovery and development of novel compounds

Discovery Lab

What happens during the discovery process?

Ingredients or chemicals of interest are extracted from natural sources or synthesized in the laboratory. Promising candidates are further processed and tested for desirable characteristics and function. Researchers look for reliable high-throughput methods to identify promising compounds as quickly and accurately as possible.

1 Save time during synthesis/extraction with the right evaporation condenser

In the first step of the discovery process, ingredients are either synthesized or extracted. Different condensers on your rotary evaporator can be used to match your specific application and speed up your process. For example, a reflux condenser is most commonly used for fast extraction of target molecules with high yields. Alternatively, a Soxhlet condenser can be used to continuously extract the target of interest with fresh solvent to reduce solvent use.

🕒 **Look for an instrument that can combine solutions for evaporation, Soxhlet and reflux extractions for maximal flexibility and speed.**

2 Speed up your concentration step with more flexible solutions

Following synthesis or extraction, you need to concentrate or dry your mixture by evaporation. To quicken this process, look for solutions that ideally fit your needs. For example, try:

- A fully integrated rotary evaporation system (rotary evaporator, pump, chiller and regulating interface) to avoid downtime
- Parallel evaporation where you can simultaneously dry multiple samples with a wide range of starting volumes
- Use Dewar accessory to prepare your sample for freeze-drying directly on your rotary evaporator

3 Optimize your separation with different chromatography types

Depending on the which step of the discovery process you are on, a different chromatography approach might be better suitable for the separation of compounds from the concentrated mixture. For example, flash chromatography can be used as a fast pre-purification step, whereas preparative high-pressure liquid chromatography (prep HPLC) offers high purity of the target compound.

🕒 **Systems that offer both flash and prep HPLC capabilities, as well as various modes of detection, such as UV and ELSD, can offer you more choice when optimizing the separation of your target of interest.**

4 Protect your precious compound by using freeze-drying

Pharmaceutical and chemical molecules of interest are highly diluted after separation and need to be concentrated prior to following processing steps. By finding a gentle process, such as freeze drying, you can remove solvents from your sensitive product with minimal damage. In a dry state, the compounds can be readily stored and reconstituted by simply replacing the solvent.

5 Check the purity of your final product to ensure top quality

Determine the melting point of your target compound as a quality control step. This property is an established indicator of the purity of the material.

🕒 **Did you know that melting point systems can be compliant to Pharmacopeia? Simplify your workflow by making sure your device corresponds to industry standards.**

Development Lab

What happens during the development process?

Once an active pharmaceutical ingredient (API) or chemical of interest has been identified, the development of the production process can begin. Here, process and formulation optimization are key in avoiding costly mistakes on a large-scale level. High-throughput instruments and techniques with superior reliability are preferred by developers of therapeutics and chemical compounds.

1 Keep the same synthesis process parameters when scaling-up

Maintain the integrity of your process by keeping the same parameters when upscaling your reflux or Soxhlet extraction steps. Achieve this by finding equipment that is compatible with both smaller evaporating flask sizes and industrial size labware.

2 Save time by adapting the concentration step to your needs

Be aware of the many possibilities available to you for your concentration needs. Find options that are perfectly suited to your sample volumes by choosing appropriate evaporating flask sizes. Note that the distillation rates of different solvents differ. Select suitable evaporators that can offer you an automated evaporation step with a faster evaporation rate and the same parameters compared to the lab-scale instrument.

🕒 **Accessories such as a pump, interface and chiller can greatly improve the automation, speed and reliability of the concentration step.**

3 Let the chromatography accessories fit your sample size

Once your separation is optimized on a lab-scale, it is time to upscale the process. For this purpose, look for flexible solutions when selecting:

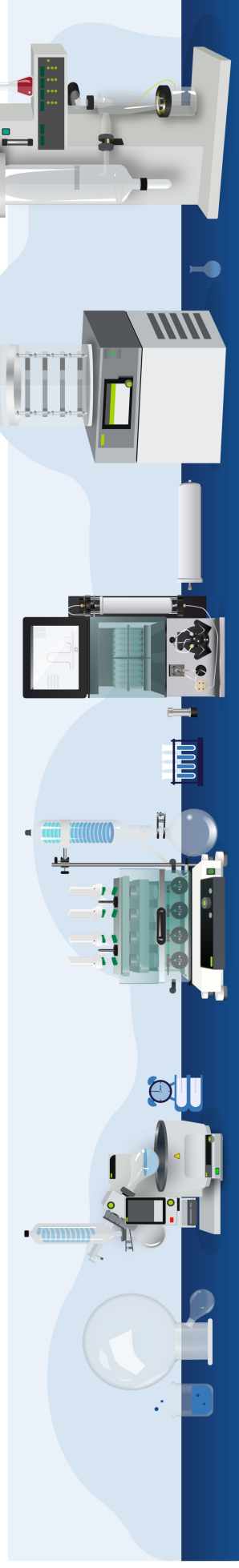
- Different sizes of flash cartridges, prep HPLC columns and glass columns
- Collection vessel sizes
- Options for solid and liquid sample injections via syringe, loop or external pump

4 Use freeze drying as a suitable method for high throughput processes

Due to the large amounts of solvents using during chromatography fractionation, your molecule of interest is often diluted. Therefore, you need to concentrate your compound prior to formulation. Freeze drying is a suitable technique for safe removal of water and organic based solvents from precious products. Freeze drying uses stable parameters that increase the reproducibility of the process. The technique is suitable for use regardless of how large your sample throughput will be in the future.

5 Perfect your formulations with pre-formulation techniques

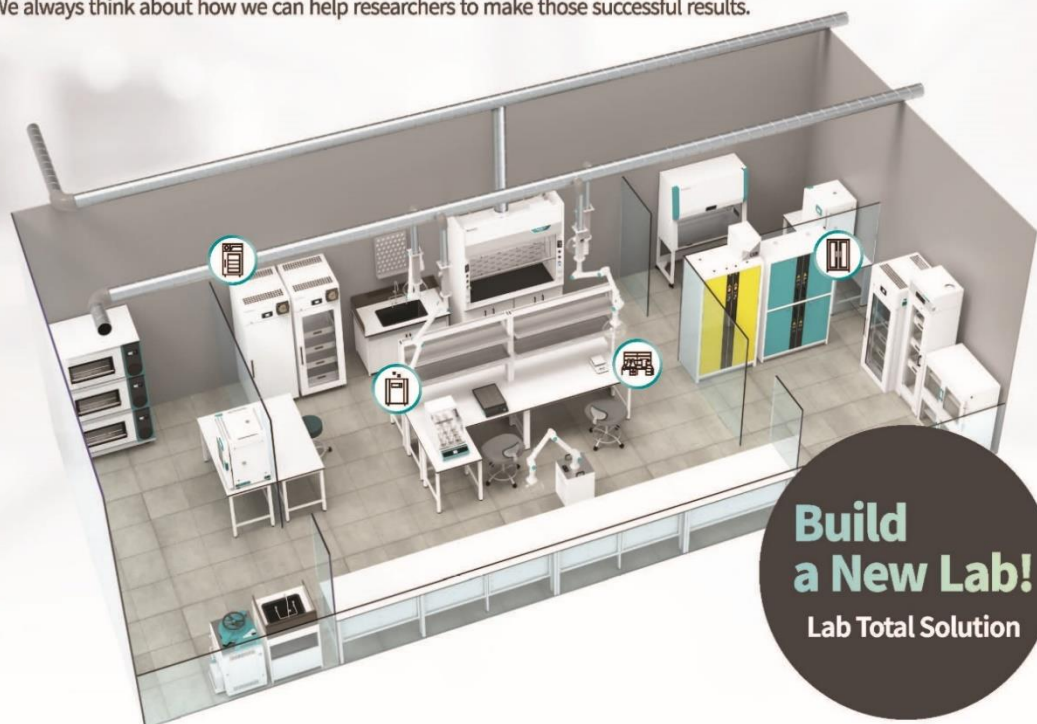
Even though your functional molecule may possess interesting activities, it can be challenging to incorporate the compound into a formulation without losing properties or displaying undesirable characteristics. One way to facilitate the formulation is to attempt pre-formulation via spray drying or encapsulation. These techniques create dry particles, microcapsules, wet beads and core shell capsules from various materials.



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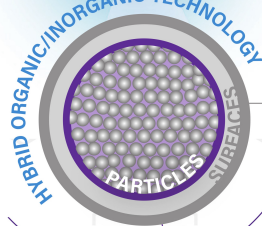
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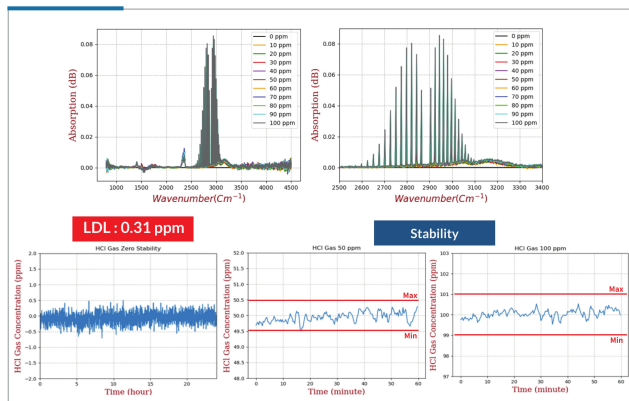
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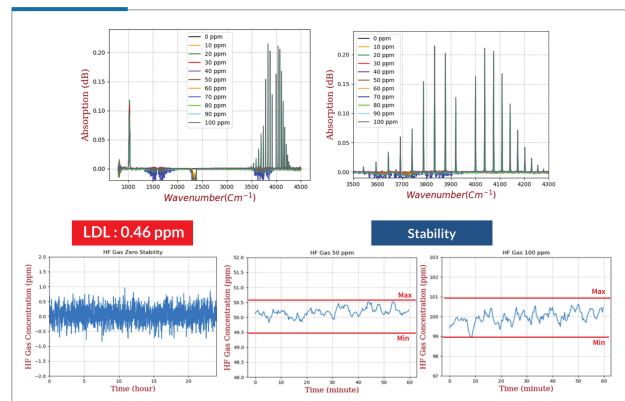


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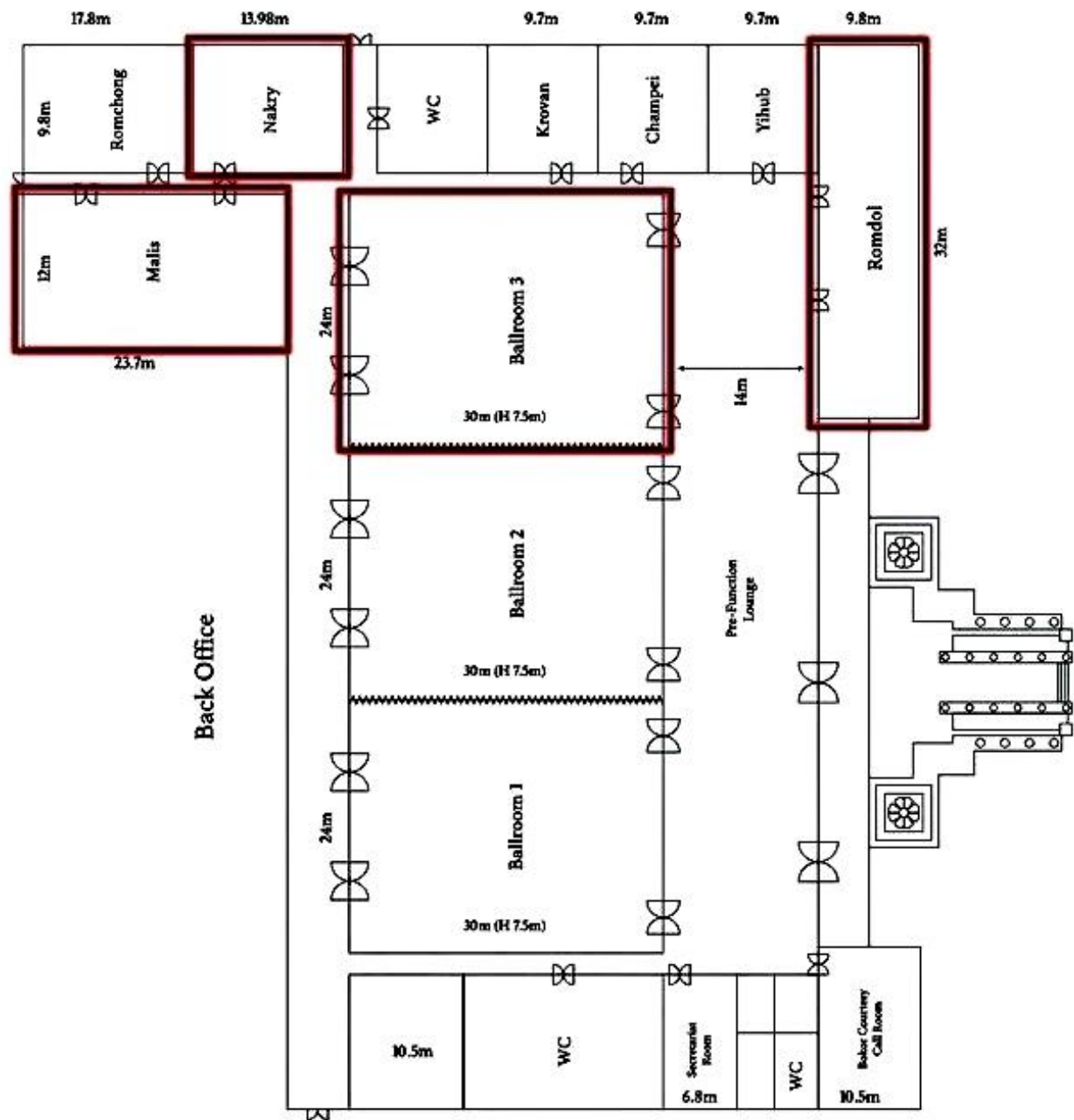
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Hotel area map



Floor plan



Program of the APCE-CECE-ITP-IUPAC 2022

November 6–10, 2022, Siem Reap (Angkor Wat), Cambodia

November 6, 2022 (Sunday)

	IUPAC Overview Chairs: Roberto Terzano (University of Bari) Annemieke Farenhorst (University of Manitoba)		<i>Malis Meeting Room</i>
13:00-13:10	Introduction of IUPAC and Division VI – Chemistry and the Environment Roberto Terzano (University of Bari)		
13:10-13:35	A brief history of IUPAC Bipul Behari Saha (Sagar Group of Institutions)		
13:35-13:45	Global women's breakfast Hemda Garelick (Middlesex University)		
13:45-14:20	The global scenario and challenges of radioactive waste in the marine environment Nicholas Priest (Laval University)		
14:20-14:30	Carbon sequestration: Harmonizing carbon sequestration measurement – what does it mean and how we do it Diane Purchase (Middlesex University)		
14:30-14:50	Coffee Break		<i>Ballroom 3</i>
14:50-15:20	Techniques, tools, and markets for evaluating carbon sequestration Michelle Bailey (NIST)		
15:20-15:40	Minimizing environmental impacts of tyres and road wear particles Divina Navarro (University of Adelaide)		
15:40-16:00	Tyres and road wear particles: precursors of disinfection byproducts Lokesh Padhye (University of Auckland)		
16:30-16:45	Opening Ceremony Chairs: Doo Soo Chung (Seoul National University) František Foret (Czech Academy of Sciences)		<i>Malis Meeting Room</i>
16:45-16:55	Jaroslav Janák Award for contribution to separation sciences to Martin Gilar (Waters Corporation)		
	Plenary Lectures Chair: František Foret (Czech Academy of Sciences)		<i>Malis Meeting Room</i>
16:55-17:35	PL1	LC MS methods for analysis of therapeutic oligonucleotides and mRNA Martin Gilar (Waters Corporation)	
17:35-18:15	PL2	Ethics and emergency time Bettina Couderc (Institut Claudius Regaud)	
18:30-20:00	Welcome Reception		<i>Poolside Terrace</i>

November 7, 2022 (Monday)

	Poly- and Perfluoroalkyl Substances (PFAS) in the Environment (I) <i>Malis</i> Chair: Rai Kookana (CSIRO Land and Water)	
09:00-09:25	KN1	The complex challenges of poly- and perfluoroalkyl substances as environmental contaminants: A soil perspective Christopher P. Higgins (Colorado School of Mines)
09:25-09:45	I1	Poly- and perfluoroalkyl substances: Personal observations on challenges for risk assessment and management of environmental contamination Karl Bowles (RPS AAP Consulting Pty Ltd)
09:45-10:05	I2	Potential release of PFAS from spent engineered sorbents Melanie Kah (University of Auckland)
10:05-10:25	I3	Electrostatic interactions of poly- and perfluoroalkyl substances (PFAS) with soil minerals Balwant Singh (University of Sydney)
10:25-10:40	O1	Stabilisation treatments for PFAS in soils: Assessment of durability and longevity Divina Navarro (University of Adelaide)
	Chemosensors <i>Romdol Meeting Room</i> Chairs: Joohoon Kim (Kyunghee University) Gabor Jarvas (University of Pannonia)	
09:00-09:25	KN2	Electrochemiluminescence to shed light on analytical science Joohoon Kim (Kyunghee University)
09:25-09:45	I4	Electrochemiluminescence as a versatile tool for the selective detection of diagnostic biomarkers and environmental pollutants Jong-In Hong (Seoul National University)
09:45-10:05	I5	Neural mechanism mimetic 2nd generation electronic nose Jin-Woo Oh (Pusan National University)
10:05-10:20	O2	Preparation and characterization of metallic hybrid nanostructures for diclofenac detection Nguyen Thi Thanh Ngan (Vietnam Academy of Science and Technology)
10:40-11:00	Coffee Break <i>Ballroom 3</i>	
	Poly- and Perfluoroalkyl Substances (PFAS) in the Environment (II) <i>Malis</i> Chair: Melanie Kah (University of Auckland)	
11:00-11:25	KN3	Per- and polyfluoroalkyl substances in a population of Filipino women: an ASEAN perspective on PFAS Michael C. Velarde (University of the Philippines Diliman)
11:25-11:45	I6	Poly- and perfluoroalkyl substances (PFAS) in the land and water environments of Asia Rai S Kookana (CSIRO Land and Water)
11:45-12:00	O3	PFAS in the Pearl River system Guang-Guo Ying (South China Normal University)
12:00-12:15	O4	Metrology of PFAS Zoltan Mester (National Research Council of Canada)
12:15-12:30	<i>Open Discussion</i>	
	Sample Preparation <i>Romdol Meeting Room</i> Chairs: Hong Heng See (Universiti Teknologi Malaysia) Jeongmi Lee (Sungkyunkwan University)	
11:00-11:25	KN4	Development and application of in-needle microextraction Sunyoung Bae (Seoul Women's University)
11:25-11:45	I7	Electro-driven extraction based on a polymer inclusion membrane (PIM) sampling probe Hong Heng See (Universiti Teknologi Malaysia)
11:45-12:00	O5	Alkaline poly(ethylene) glycol 8000-based solid-phase extraction (AP-SPE): A novel in-field compatible, rapid sample preparation method Soomin Lee (Deakin University)

November 7, 2022 (Monday)

12:00-12:15	O6	Extraction of intact proteins from biological fluids by non-immunoaffinity sample preparation method Katarína Marakova (Comenius University)
12:30-13:30	Lunch <i>Lotus Restaurant</i>	
	The Environment, Health and Food Safety Impact of Microplastics (I) <i>Malis</i> Chair: Hemda Garelick (Middlesex University)	
13:30-13:55	KN5	Microplastic pollution in the marine environment Fani Sakellariadou (University of Piraeus)
13:55-14:15	I8	Photodegradation of HDPE and assessing its contribution to microplastic pollution in coastal waters Lokesh P. Padhye (University of Auckland)
14:15-14:30	O7	Recent advances in the analysis and impact of microplastics in food Clementina Vitali (Wageningen University)
14:30-14:45	O8	Status of microplastics in India Bipul Behari Saha (Sagar Group of Institutions)
14:45-15:00	O9	An overview of the technologies for microplastic remediation Diane Purchase (Middlesex University)
	Pharmaceutical Analysis <i>Romdol Meeting Room</i> Chairs: Jong Seong Kang (Chungnam National University) Thi Thanh Ngan Nguyen (Vietnam Academy of Science and Technology)	
13:30-13:55	KN6	The effects of herbal primary processing on the change in composition of alkaloids from Magnoliae cortex evaluated by LC-MS/MS Jong Seong Kang (Chungnam National University)
13:55-14:20	KN7	Deep eutectic solvents in greener analytical chemistry and material science Jeongmi Lee (Sungkyunkwan University)
14:20-14:35	O10	Metabolomics study for the evaluation of toxicity by environmental pollutant Hyung Min Kim (Chungnam National University)
14:35-14:50	O11	Bioanalytic approaches to control target protein functions by modulating protein-protein interactions based on structural analysis Youngjoo Kwon (Ewha Womans University)
14:50-15:05	O12	Chiral HPLC and molecular modeling study for enantiodiscrimination of chiral amines as three naphthalimine derivatives using amylose or cellulose derived chiral stationary phases Suraj Adhikari (Chosun University)
15:10-15:30	Coffee Break <i>Ballroom 3</i>	
	The Environment, Health and Food Safety Impact of Microplastics (II) <i>Malis</i> Chair: Diane Purchase (Middlesex University)	
15:30-15:50	I9	Microplastics contamination and their impacts in soil ecosystems Balwant Singh (University of Sydney)
15:50-16:05	I10	We need easy and feasible methods to quantify microplastics in drinking water or wastewater Hyunook Kim (University of Seoul)
16:05-16:20	O13	Environmental and human exposure associated consequences of micro- and nano-size plastic polymers Roland Kallenborn (Norwegian University of Life Sciences)
16:20-16:35	O14	Pesticide sorption by microplastics and other constituents in Prairie rivers Annemieke Farenhorst (University of Manitoba)
16:35-16:50	O15	From macroplastics to nanoplastics: The presence of plastic particles in personal hygiene products and their possible impact on the environment and on human health Hemda Garelick (Middlesex University)
16:50-17:00	<i>Open Discussion</i>	

November 7, 2022 (Monday)

	Advances in CE <i>Romdol Meeting Room</i> Chairs: David D. Y. Chen (University of British Columbia) Blanca H. Lapizco-Encinas (Rochester Institute of Technology)	
15:30-15:55	KN8	Capillary electrophoresis migration time alignment with the help of tandem mass spectrometry data David D. Y. Chen (University of British Columbia)
15:55-16:15	I11	Moving reaction boundary electrophoresis Chengxi Cao (Shanghai Jiao Tong University)
16:15-16:35	I12	Improved method for the determination of aqueous nitrate and nitrite concentration using capillary electrophoresis Gábor Járvas (University of Pannonia)
16:35-16:55	O16	Exhaled breath condensate, saliva and sweat: Alternative, non-invasive biological samples suitable for medical diagnostics by CE and HPLC Petr Kubáň (Institute of Analytical Chemistry of the CAS)
17:00-18:30	Poster Session <i>Ballroom 3</i> Chair: Tomasz Bączek (Medical University of Gdańsk)	

November 8, 2022 (Tuesday)

	Separations <i>Malis Meeting Room</i> Chairs: Hermann Wätzig (Technische Universität Braunschweig) Irena Vovk (National Institute of Chemistry)	
09:00-09:25	KN9	Separation science to ensure the quality of mRNA vaccines and biopharmaceuticals Hermann Wätzig (Technische Universität Braunschweig)
09:25-09:50	KN10	Effective separation of glycoproteins due to the difference of sugar chains in liquid chromatography Takuya Kubo (Kyoto University)
09:50-10:10	I13	Some news for CE and fatty acid separations François Couderc (Université de Toulouse)
10:10-10:25	O17	Biological sample analysis by hydrophilic interaction chromatography Makoto Tsunoda (University of Tokyo)
	Molecular Diagnosis <i>Romdol Meeting Room</i> Chairs: Weihong Tan (Hunan University) Min-Sik Kim (DGIST)	
09:00-09:25	KN11	The foundation of molecular medicine: A chemical biology approach Weihong Tan (Hunan University)
09:25-09:45	I14	Fluorescent Imaging and analysis by using de novo formation of fluorophores in biosamples Yan Lee (Seoul National University)
09:45-10:00	O18	Hybrid film based on gold nanoparticles, reduced graphene oxide and polydopamine towards electrochemical detection of circulating tumor cells Thi Thu Vu (Vietnam Academy of Science and Technology)
10:00-10:15	O19	Metabolomics in the analysis of gastrointestinal stromal tumor samples Michał J. Markuszewski (Medical University of Gdańsk)
10:25-11:00	Coffee Break <i>Ballroom 3</i>	
	CE Theory <i>Malis Meeting Room</i> Chairs: Andras Guttman (University of Pannonia) Bohuslav Gaš (Charles University)	
11:00-11:25	KN12	The fundamental aspects of capillary sodium dodecyl sulfate gel electrophoresis Andras Guttman (University of Pannonia)
11:25-11:50	KN13	Capillary electrophoresis as a tool for kinetics and thermodynamics of biomolecular and metal complex systems Nobuhiko Iki (Tohoku University)

November 8, 2022 (Tuesday)

11:50-12:10	I15	Nonlinear electrokinetics effects enable high-resolution separations Blanca H. Lapizco-Encinas (Rochester Institute of Technology)
12:10-12:30	I16	Electrolytes in nanoscale Bohuslav Gaš (Charles University)
	Biosensors <i>Romdol Meeting Room</i> Chairs: Jiří Homola (Institute of Photonics and Electronics of the CAS) Alejandro Cifuentes (Institute of Food Science Research)	
11:00-11:25	KN14	Plasmonic biosensors for biomedicine Jiří Homola (Institute of Photonics and Electronics of the CAS)
11:25-11:50	KN15	Recent advances in rapid and accurate diagnosis of COVID-19 using nanoplasmonic biosensors Jaebum Choo (Chung-Ang University)
11:50-12:05	O20	The development of nanoparticles for improved SERS detection Vladimir Jonas (Masaryk University)
12:05-12:25	I17	From cellulose (and other biopolymers) to functional sensors Carlos D. Garcia (Clemson University)
12:30-13:30	Lunch <i>Lotus Restaurant</i>	
	Environmental Analysis <i>Malis Meeting Room</i> Chairs: Michael Breadmore (University of Tasmania) Takuya Kubo (Kyoto University)	
13:30-13:55	KN16	Continuous autonomous environmental monitoring by capillary electrophoresis Michael Breadmore (University of Tasmania)
13:55-14:15	I18	Evidence of hexavalent chromium formation and plant uptake in agricultural soils after simulated fires Roberto Terzano (University of Bari)
14:15-14:30	O21	Instrumental neutron activation analysis of PM10 and PM2.5 samples collected at Daejeon in Korea Jong-Hwa Moon (Korea Atomic Energy Research Institute)
	Food Analysis <i>Romdol Meeting Room</i> Chairs: Kihwan Choi (Korea Research Institute of Standards and Science) François Couderc (Université de Toulouse)	
13:30-13:55	KN17	Challenges in chromatographic analyses of phytonutrients in plant extracts and food Irena Vovk (National Institute of Chemistry)
13:55-14:20	KN18	Accurate determination of mycotoxins and organic nutrient by isotope dilution-liquid chromatography tandem mass spectrometry Kihwan Choi (Korea Research Institute of Standards and Science)
14:20-14:40	O22	Milk protein assays by capillary electrophoresis for nutrition evaluation Walter Feng (SCIEX)
14:40-15:00	O23	New methodologies for improving safety and bioactivity in green foodomics Elena Ibáñez (Institute of Food Science Research)
15:00-15:30	Coffee Break <i>Ballroom 3</i>	
	Molecular Level Chemistry <i>Malis Meeting Room</i> Chairs: Yun Hee Jang (DGIST) Yves Lansac (Université de Tours)	
15:30-15:55	KN19	Evolution of scanning probe microscopy to nanoscale molecular analysis Sang-Joon Cho (Park Systems Corp)
15:55-16:15	I19	Morphology control of PEDOT:PSS polyelectrolyte by hard-cation-soft-anion ionic liquids: Microscopic observation by molecular dynamics simulation Yun Hee Jang (DGIST)
16:15-16:35	I20	Protamine-controlled reversible DNA packaging: A molecular glue Yves Lansac (Université de Tours)

November 8, 2022 (Tuesday)

16:35-16:55	I21	An artificial neuronal device, Cu_{2-x}Se ultrathin film memristor via atomic layer deposition Seonghoon Lee (Seoul National University)
16:55-17:10	O24	Analysis of semi-ionic C-F bonds on photoreduced graphene oxide Joon Ching Juan (University of Malaya)
	Biomarkers <i>Romdol Meeting Room</i> Chairs: Sam F. Y. Li (National University of Singapore) Yan Lee (Seoul National University)	
15:30-15:55	KN20	Integrative analysis of metabolomics and glycomics data for identifying markers of asthma in serum and sputum samples Sam F. Y. Li (National University of Singapore)
15:55-16:15	I22	Integrative multi-omic analysis to study autism spectrum disorders Min-Sik Kim (DGIST)
16:15-16:35	I23	Activity of natural compounds against Alzheimer investigated by foodomics Alejandro Cifuentes (Institute of Food Science Research)
16:35-16:50	O25	N-Glycosylation alteration of serum and salivary immunoglobulin A as a possible biomarker in oral mucositis Andras Guttman (University of Debrecen)
16:50-17:05	O26	Exploration of the metabolic alterations of short-chain fatty acids and TCA cycle intermediates in human plasma with gastric disorders Wonwoong Lee (Woosuk University)
17:30-19:30	Banquet <i>Ballroom</i>	

November 9, 2022 (Wednesday)

	Imaging <i>Malis Meeting Room</i> Chairs: Kyubong Jo (Sogang University) Svetlana M. Krylova (York University)	
09:30-09:50	I24	Microscopic DNA sequence visualization Kyubong Jo (Sogang University)
09:50-10:10	I25	Bending short dsDNA: structure and mechanical properties Nam Ki Lee (Seoul National University)
10:10-10:30	O27	Nanoparticle tag counting for tissue imaging using infrared laser ablation Jan Preisler (Masaryk University)
	Tools for Biology <i>Romdol Meeting Room</i> Chairs: Tomasz Bączek (Medical University of Gdańsk) Jongcheol Seo (POSTECH)	
09:30-09:55	KN21	Off-line clean-up and on-line preconcentration new approaches prior to capillary electrophoresis separations of drugs and endogenous substances Tomasz Bączek (Medical University of Gdańsk)
09:55-10:15	I26	UV sterilization of Bacillus atrophaceus spores on various conditions Jeongkwon Kim (Chungnam National University)
10:15-10:35	I27	Proximity labeling, an enzymatic tool for spatial biology Hyun-Woo Rhee (Seoul National University)
10:35-11:00	Coffee Break <i>Ballroom 3</i>	

November 9, 2022 (Wednesday)

	Affinity in CE Chairs: Sergey Krylov (York University) Nobuhiko Iki (Tohoku University)		<i>Malis Meeting Room</i>
11:00-11:25	KN22	Transient incomplete separation of species with close diffusivity to study stability of affinity complexes Sergey Krylov (York University)	
11:25-11:45	I28	Affinity capillary electrophoretic study of noncovalent molecular interactions using uncorrected and ionic strength corrected actual mobilities of the species involved Václav Kašíčka (Czech Academy of Sciences)	
11:45-12:05	I29	Using capillary electrophoresis to make aptamer selection a quantitative process Svetlana M. Krylova (York University)	
12:05-12:20	O28	(1R,2S)-N-Dodecyl-n-methylephedrinium bromide as a chiral selector in enantioseparations using capillary electrophoresis Pavel Jác (Charles University)	
	Biomolecule Analysis Chairs: Hanne Røberg-Larsen (University of Oslo) Nam Ki Lee (Seoul National University)		<i>Romdol Meeting Room</i>
11:00-11:25	KN23	Quantitative analysis of oligo: mRNA vaccine, gene therapy and mRNA end capping Seo Bong Chang (SCIEX)	
11:25-11:45	I30	Selective detection of protein acetylation by NMR spectroscopy Jung Ho Lee (Seoul National University)	
11:45-12:05	I31	New analytical approach for distinguishing biomolecular topologies using ion mobility spectrometry-mass spectrometry Jongcheol Seo (POSTECH)	
12:05-12:20	O29	Oxysterols are secreted from non-alcoholic fatty liver disease (NAFLD) induced organoids Hanne Røberg-Larsen (University of Oslo)	
12:30-13:30	Lunch		<i>Lotus Restaurant</i>
	Column Technology Chairs: František Švec (Charles University) Václav Kašíčka (Czech Academy of Sciences)		<i>Malis Meeting Room</i>
13:30-13:55	KN24	Porous polymer monoliths: A universal tool in chromatography František Švec (Charles University)	
13:55-14:15	I32	Acrylate monolith precursor having carboxy surface and its functionalization with polar, non-polar, and chiral ligands for capillary electrochromatographic separation Ziad El Rassi (Oklahoma State University)	
14:15-14:35	O30	Recent developments in the synthesis of high-performance anion-exchange materials based on hyperbranched polymers Christopher Pohl (Thermo Fischer Scientific)	
14:35-14:50	O31	New studies on poly(ethylene glycol)-based hydrogels in electrophoresis Chenchen Liu (Kyushu University)	
	Mass Spectrometry Chairs: Oliver J. Schmitz (University of Duisburg-Essen) Jeongkwon Kim (Chungnam National University)		<i>Romdol Meeting Room</i>
13:30-13:50	I33	APCI, APPI, APLI, and DBD: Uncommon ionization methods for GC-MS Oliver J. Schmitz (University of Duisburg-Essen)	
13:50-14:10	I34	Machine learning in mass spectrometry analysis and microplastic analysis Han Bin Oh (Sogang University)	

November 9, 2022 (Wednesday)

14:10-14:25	O32	Ionization by Au⁺: A new tool for mass spectrometry of volatile organic compounds Antonin Bednarik (Masaryk University)
14:25-14:40	O33	Development of certified reference materials for the determination of bisphenol A in polycarbonate/acrylonitrile-butadiene-styrene (PC/ABS) Dong Kyu Lim (Korea Research Institute of Standards and Science)
14:50-15:30	Coffee Break <i>Ballroom 3</i>	
	Instrumentation <i>Malis Meeting Room</i> Chairs: Petr Kubáň (Czech Academy of Sciences) Jung Ho Lee (Seoul National University)	
15:30-15:50	I35	Development of Fourier transform infrared spectroscopy for chimney telemetry system Jong Hae Lee (S-Fac)
15:50-16:10	I36	Better analysis with nanobio-conjugated sensing platforms for biomedical applications Sang Hyuk Lee (Kyungpook University)
16:10-16:30	O34	High sensitivity portable gas chromatography Sun Jong Back (Bioneer)
16:30-16:45	O35	“In-vivo” study of the kinetics of changes in the plant saps composition by laboratory-built capillary electrophoresis device Natália Melicherová (Czech Academy of Sciences)
	Microfluidics <i>Romdol Meeting Room</i> Chairs: Steven Ray Wilson (University of Oslo) Han Bin Oh (Sogang University)	
15:30-15:55	KN25	One-flow synthesis of functional chemicals via diverse phase separation steps Dong-pyo Kim (POSTECH)
15:55-16:15	I37	Coupling organoids and organ-on-a-chip with liquid chromatography-mass spectrometry Steven Ray Wilson (University of Oslo)
16:15-16:30	O36	3D printing of porous materials integrated miniaturized fluidic devices for electrokinetic DNA extraction and soil analysis Hari Kalathil Balakrishnan (Deakin University)
16:50-17:30	Poster Awards <i>Ballroom 3</i> Chair: Tomasz Bączek (Medical University of Gdańsk)	

November 10, 2022 (Thursday)

09:00-12:00	Scientific Discussions and Closing Ceremony
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List of poster presentations

- P1 Analysis of biogenic amines and benzo[a]pyrene in black pepper prepared under various cooking methods**
Byungjoo Yoo, Hyunwoo Ahn, Kwang-Geun Lee
- P2 Analysis of furan in red pepper powder treated by three methods - boiling, roasting, and frying**
Sookyoung Kim, Seung-Woo Ha, Kwang-Geun Lee
- P3 Arduino-based autosampler for an in-house built capillary electrophoresis instrument**
Petra Itterheimová, Martin Kubáň, František Foret, Petr Kubáň
- P4 Biodegradation degree analysis and examination of biodegradable resin PHA (Poly hydroxy alkanoate) in composting and natural soil condition**
Han Chang Hoon, Lee Se Jin, Won Cheol Hyun
- P5 Biomaterial actuator of M13 bacteriophage in tunable gap plasmonic color film for diagnosing lung cancer**
Thanh Mien Nguyen, Gyeong-Ha Bak, You Hwan Kim, Tae-Young Jeong, TaeYeon Kim, YeongHwa Kim, Jeong Seok Han, YeNi Cho, Jin-Woo Oh
- P6 Characterization of isomeric lipid-A species from *Pseudomonas aeruginosa* by non-aqueous CE-MS/MS with collision-induced dissociation**
Viktor Sándor, Anikó Kilár, Bettina Ürmös, Ibrahim Aissa, Ágnes Dörnyei
- P7 Characterization of tau proteome in human cerebrospinal fluid**
Andrej Kovac, Juraj Piestansky, Petra Majerova, Jozef Hanes
- P8 Chiral resolution of thyroxine enantiomers using chiral crown ether column by UPLC-tandem mass spectrometry**
Suraj Adhikari, Jisun Lee, Wonjae Lee, Hye-Ran Yoon
- P9 Chiral separation and determination of the absolute configuration of bioactive indole-containing pyrazino[2, 1-b] quinazoline-3,6-diones for metabolism study**
Long Solida, Song Sousdey, Ven Sovannaroeth, Emilia Sousa
- P10 Correlation analysis between volatile compounds and α -dicarbonyl compounds in various beans as responses to different roasting conditions**
Gaeun Lee, Haeun Lee, Kwang-Geun Lee
- P11 Determination of nutrient concentration in cyanobacterial liquid culture by CE and ICP-MS**
Natália Melicherová, Tomáš Vaculovič, Radka Kočí, Martin Trtílek, Jana Lavická, František Foret
- P12 Determination of vancomycin in livestock and fishery products using liquid chromatography-tandem mass spectrometry**
Bohyun Shin, Chohee Jeong, Sang Beom Han
- P13 Development of a new biomarker model for predicting preterm birth in cervicovaginal fluid**
Ji-Youn Lee, Sun Koung Joung, Dong-Kyu Lee, Sang Beom Han
- P14 Development of the simultaneous analytical methods of nine compounds in Magnoliae cortex treated with the herbal primary processing using HPLC**
Chong Woon Cho, Young Sik Park, Hyung Min Kim, Jong Seong Kang
- P15 Development of UHPLC-MS/MS method for the analysis of topotecan in plasma and vitreous humor samples for application in retinoblastoma therapy**
Barbora Mudrova, Katerina Hrabakova, Petr Kozlik, Jakub Sirc, Zuzana Bosakova
- P16 Discovery of potential quality marker of Duliang herbal formula for migraine via network pharmacology and LC-PDA-MS/MS analysis**
Duc Thanh Chu, Chong Woon Cho, Hyung Min Kim, Jong Seong Kang
- P17 Dissipation patterns and dietary risk assessments of acrinathrin and cyenopyrafen in sweet pepper using LC-MS/MS and GC-MS/MS**
Jung-Hoon Jung, Seong-Hoon Jeong, Jong-Wook Song, Jong-Su Seo, Jong-Hwan Kim
- P18 Dissipation patterns and risk assessment of the insecticides propiconazole, hexaconazole, tetraniliprole, and isopyrazam in green pepper using LC-MS/MS**
Seong-Hoon Jeong, Jung-Hoon Jung, Jong-Wook Song, Jong-Su Seo, Jong-Hwan Kim
- P19 Effect of roasting after sugar-soaking on the level of volatile compounds, total polyphenols, total**

- flavonoids, and isoflavones in black soybean (*Glycine max* (L.) Merr)**
 Jaehye Choi, Dachyeop Lee, Kwang-Geun Lee
- P20 Electrospray ionization charge-detection mass spectrometry (ESI-CDMS) for analysis of microplastics**
 Elaura Gustafson, George Gao, Kate Hales, Daniel E. Austin
- P21 Electrospray ionization-mass spectrometry with reducing agents**
Yunseop Choi, Sanghwang Park, Jongcheol Seo
- P22 Emission behavior of VOC and formaldehyde from cut edges in building products**
Man-Goo Kim, Jun-Ho Park
- P23 Evaluation of different ionic liquids for electromembrane extraction across a hollow polymer inclusion membrane for analysis of herbicides**
Ye Tim Pung, Sabita Samy, Hong Heng See
- P24 Food supplements - fact or fiction?**
Maja Bensa, Vesna Glavnik, Irena Vovk
- P25 From basic research to application: A high performance immune-affinity based extracorporeal virus capture system**
G. Jarvas, D. Szerenyi, H. Jankovics, F. Vonderviszt, J. Tovari, L. Takacs, F. Foldes, B. Somogyi, F. Jakab, A. Guttman
- P26 Gold nanoparticles – from synthesis to extraction of biological thiols and CE-LIF analysis**
Věra Dosedělová, Petr Kubáň
- P27 Headspace in-tube microextraction capillary electrophoresis mass spectrometry**
Joon Yub Kwon, Doo Soo Chung
- P28 Highly efficient three-phase single drop microextraction coupled with a commercial capillary electrophoresis instrument**
Sunkyoung Jeong, Joseph E. Valdez, Natalia Miękus, Joon Yub Kwon, Wooyong Kwon, Tomasz Bączek, Doo Soo Chung
- P29 Highly sensitive analysis of cationic ink by large volume sample stacking with an electroosmotic flow-nonaqueous capillary electrophoresis**
Jiwoong Seol, Sunkyoung Jeong, Eunjung Kwon, Seung-Hoon Bahng, Doo Soo Chung
- P30 Host-guest chemistry of CB[7] and imipramine: Impact on the protonation site**
Jiyeon Lee, Hyerim Kim, Jongcheol Seo
- P31 Hybrid similarity search algorithm applications in identifying unknown compounds in a variety of products using mass spectrometry: consumer chemical products and drug analogues**
Jin Woo Kim, So Yeon Lee, Han Bin Oh, Bong June Sung
- P32 Ion mobility mass spectrometry of phosphorylated tau peptides from Alzheimer's disease brain**
Petra Majerova, Andrej Kovac
- P33 Liquid extraction surface analysis-capillary electrophoresis/2C4D for the simultaneous analysis of cations and anions on lithium battery anode surface**
Sunkyoung Jeong, Byung-Hee Choi, Jonggeol Kim, Hee-Sun Yun, Doo Soo Chung
- P34 MALDI-MS of semiconductor nanoparticles with porphyrin matrices and focused electrospray deposition**
Sanghwang Park, Jiyeon Lee, Jongcheol Seo
- P35 Microplastic pollution in Athens Riviera, Gr.**
 Ioanna Maria Trifona, Fani Sakellariadou
- P36 Miniaturized liquid junction-based ESI interfaces**
Roman Řemínek, Elizaveta Vereshchagina, Andreas Vogl, Tomáš Václavek, František Foret
- P37 Monitoring of biologically relevant molecules in multicellular 3D spheroids cultivated inside microfluidic systems**
Karel Kleparník, Michael Killinger, Marketa Prochazkova
- P38 NACE-ESI-MS/MS method for the separation and characterization of phosphate and acyl chain positional isomers of bacterial lipid**
Anikó Kilár, Ágnes Dörnyei, Aissa Ibrahim, Viktor Sándor
- P39 Photon-upconversion sensing in droplet microfluidics**
Jana Křivánková, Antonín Hlaváček, František Foret
- P40 Preliminary stable isotope analyses for the discrimination of shotshell propellants**
Nam Yee Kim, Byeong-Yeol Song, Dong-Hwan Kim

- P41 Preparation of turmeric powder with various extraction and drying methods**
Junyoung Park, Hyunwoo Ahn, Kwang-Geun Lee
- P42 Preparative 3D printed device for the short DNA fragment separation**
Helena Hrušková, Roman Řemínek, František Foret
- P43 Qualitative and quantitative analyses of major constituents from pomegranate rind (*Punica granatum* L.): Establishment of an herbal pharmacopeial standardization**
Bunleu Sungthong, Cathaleeya Mekjaruskul, Wanida Caichompoo, Somsak Nualkaew
- P44 Recovery of clean polymers from waste plastics**
Pallab Das, Jong-Min Lee
- P45 Salicylic acid metabolism in plants – LC-MS/MS method development**
Jitka Šíroková, Lucie Polášková, Asta Žukauskaitė, Ondřej Novák
- P46 Sample pretreatment by Fe₃O₄ nanoparticles functionalized with ionic liquids and a double-chained surfactant**
Natalia Treder, Anna Roszkowska, Ilona Olędzka, Tomasz Bączek, Alina Plenis
- P47 Separation and identification of volatile constituents in herbal medicine prescription dry extract by headspace-solid phase microextraction-gas chromatography-mass spectrometry (HS-SPME-GC-MS/MS)**
Sumin Seo, Sang Beom Han
- P48 Simultaneous determination of 61 fentanyl analogues in patch using liquid chromatography-tandem mass spectrometry (LC-MS/MS)**
Sojung Park, Jiyu Kim, Sang Beom Han
- P49 Single bubble in-tube microextraction**
Sunkyoung Jeong, Xamyo Noulorsaytour, Joseph E. Valdez, Doo Soo Chung
- P50 Surface-enhanced Raman spectrometry: online detection in capillary electrophoresis**
Anna Tycova, Jan Prikryl, Jakub Novotny, Detlev Belder, Frantisek Foret
- P51 The effect of the sample glucose content on PNGase F mediated N-glycan release**
R. Torok, F. Auer, R. Farsang, E. Jona, G. Jarvas, A. Guttman
- P52 The study of fingerprint degradation and composition according to aging**
Nam Yee Kim, Woo-Yong Park, Jong Shin Park
- P53 Untangling pathways of RNA hairpins in gaseous phase investigated using ion mobility spectrometry-mass spectrometry**
Dahye Im, Jongcheol Seo
- P54 Use of a minimally-invasive method for the proteomic sex estimation from human tooth enamel**
Ivan Mikšík, Jaroslav Brůžek, Anežka Kotěrová, Marine Morvan, Jiřina Dašková, Petr Velemínský, Frédéric Santos, Jana Velemínská, Alžběta Danielisová, Eliška Zazvonilová, Bruno Maureille