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# **Programme of the 20th International Students Conference “Modern Analytical Chemistry”**

Prague, 19—20 September 2024



**FACULTY OF SCIENCE**  
Charles University

Prague 2024




## General Information

The **conference is held** at the Institute of Chemistry, Faculty of Science, Charles University (Hlavova 8, 128 43 Prague 2) in the lecture hall CH1 (Brauner Theatre).

The **registration** is located at the entrance to the building. It will be open on Thursday, September 19 from 8:30 to 9:00. Contact the organizers in advance for later registration.

**Oral presentations** are **15 minutes** including discussion, and speakers are asked to download their PowerPoint presentation on the local computer in the lecture hall before the start of the session. We ask participants to keep the start and end times of their lecture according to this programme (the letter “P” and the following number denote the page of the abstract/contribution in the *Proceedings*).

**Online participation** in the conference is possible via Google Meet, which requires only an Internet connection, a microphone, and a speaker. The link is: <https://meet.google.com/dmn-hzuz-pvj> Please, keep your speakers turned off during your presentation to avoid unwanted echoes. Online presentations are marked with the symbol  in the programme.

Each session is chaired by one selected conference participant. The **chairperson's task** is to introduce each speaker, supervise timing, and moderate and stimulate discussion after each presentation.

**Coffee breaks** take place in the lecture hall.

**Lunch** is served in the room G2 (the second door on the left of the entrance to the building) in the building Albertov 6 (building opposite the entrance to the Institute of Chemistry). A joint departure for lunch will be organized. The menu is given on page 10.

There is a **WiFi network** in the building; use your Eduroam account to connect.

## Sponsors

The organizers of the 20th International Students Conference “Modern Analytical Chemistry” gratefully acknowledge the generous sponsorship of following companies:



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# Programme

## Thursday, September 19, 2024


- 8:30–9:00 **Registration of participants**
- 9:00–9:15 **Opening ceremony, welcoming address**
- Session 1** • chairperson: Mr Michal Zelenský
- 9:15–9:30  Ms Anna Bonczyk (Jagiellonian University, Poland): *Research on the development of a Lab-on-Chip system as an alternative approach for psychoactive substances detection* (P-89)
- 9:30–9:45 Mr Petr Rudolf (University of Chemistry and Technology, Czech Republic): *Analysis of liquids by LA-ICP-MS* (P-77)
- 9:45–10:00  Mr Karol Kubacki (Jagiellonian University, Poland): *Determination of antibiotics using smartphone-based detection* (P-85)
- 10:00–10:15 Ms Michaela Aichinger (University of Regensburg, Germany): *Development of liposome surface chemistries to study the complement system* (P-68)
- 10:15–10:30 Mr Oleksi Kaminskyi (University of Chemistry and Technology, Czech Republic): *Human scent analysis on fired cartridge cases from simulated crime scene* (P-43)
- 10:30–10:45 **Coffee Break**
- Session 2** • chairperson: Ms Katja Riedel
- 10:45–11:00 Mrs Lucie Pražáková (Charles University, Czech Republic): *Electrochemical degradation of pharmaceuticals: A study of flow and static cell configurations* (P-91)
- 11:00–11:15 Ms Katharina Weiss (University of Regensburg, Germany): *Development of novel sample preparation strategies for nucleic acid detection at the point of care* (P-66)
- 11:15–11:30 Ms Lucie Dostálková (Charles University, Czech Republic): *Study of the electrochemical behaviour of selaginpulvilins differing in the presence of a hydroxyl group* (P-74)
- 11:30–11:45 Mr Vojtěch Vilím (Charles University, Czech Republic): *Miniaturized UV-photochemical generator of volatile species combined with sequential injection analysis* (P-93)

- 11:45–12:00  Ms Joanna Pluta (Jagiellonian University, Poland):  
*Application of GC-MS/MS method for quantification short-chain fatty acids in biological samples (P-80)*
- 12:00–12:15 **Presentation of Sponsor:** Mgr. Radek Vyhnanek (ALS Czech Republic): *ALS environmental laboratory, (how) do you know us?*
- 12:15–13:00 **Lunch**
- Session 3** • chairperson: Mr Michal Zelenský
- 13:00–13:15 Ms Eva Bláhová (Charles University, Czech Republic) :  
 *Voltammetric behaviour of oxysterols and development of HPLC method for their separation (P-37)*
- 13:15–13:30 **Presentation of Sponsor:** Mr David Kolář (Quinta-Analytica):  
*Quinta-Analytica: The gateway to clinical trials and bioanalytics*
- 13:30–13:45 **Presentation of Sponsor:** Mgr. Ondřej Kuchler (ECOM):  
*Modern approach for analytical and preparative liquid chromatography by ECOM manufacturer*
- 13:45–14:00 **Presentation of Sponsor:** Ing. Václav Helán (2THETA ASE):  
*On-site analysis as a special case of sampling*
- 14:00–14:15 Ms Svetlana Pucovski (Charles University, Czech Republic):  
*Application of silver solid amalgam as a substrate for the preparation of new film electrodes (P-92)*
- 14:15–14:30 Mrs Alice Šimonová (Charles University, Czech Republic):  
*Capillary electrophoresis analysis of interactions between lipophilic active pharmaceutical ingredients and liposomes (P-71)*
- 14:30–14:45 Ms Vivien Fleischmann (University of Regensburg, Germany):  
*Molecular imprinted polymer coated laser-induced carbon nanofibers as a high-performing enzyme-free sensor (P-59)*
- 14:45–15:00 **Coffee Break**
- Session 4** • chairperson: Ms Inga Sowik
- 15:00–15:15 Mr Martin Šefčík (Charles University, Czech Republic):  
*Forced oxidative degradation of pharmaceuticals: An electrochemical approach (P-76)*
- 15:15–15:30 Mr Jan Vališ (University of Chemistry and Technology, Czech Republic): *Development of novel in vivo Raman spectroscopy instrumentation coupled with chemometric methods for cancer detection*

- 15:30–15:45  Ms Monika Wypych (University of Lodz, Poland): *Spiciness of hot peppers – determination using voltammetry* (P-72)
- 15:45–16:00 Mrs Sandra Gierlich (University of Regensburg, Germany): *Development of liposomes as diagnostic reagent for complement-related diseases* (P-65)
- 16:00–16:15  Ms Anna Sałdan (Jagellonian University, Poland): *Development of the CE-MS method for the identification of disperse dyes extracted from polyester fibers for forensic purposes* (P-88)
- 16:15–16:30 Ms Kristýna Jelšíková (Charles University, Czech Republic): *Study of electrochemical behaviour of primary and secondary bile acids on boron-doped diamond electrode* (P-95)
- 16:30–16:45 Mrs Inga Sowik (Warsaw University of Technology, Poland): *Determination of explosives in plant matrix* (P-94)

## Friday, September 20, 2024

### Session 5 • chairperson: Mrs Michaela Aichinger

- 9:00–9:15 Mr Ivan Kopal (University of Chemistry and Technology, Czech Republic): *Chemical enhancement of surface-enhanced Raman scattering: formation of surface complexes, (photo)chemical reactions, and implications for chemical analysis* (P-53)
- 9:15–9:30  Ms Urszula Ryszko (Łukasiewicz Research Network, Poland): *Insights into Cd(II) ions sorption mechanism from wet phosphoric acid on acidic cation exchangers based on spectroscopic studies*
- 9:30–9:45 Mrs Simona Adamová (Charles University, Czech Republic): *Methods of extraction and stabilization of silver nanoparticles in cosmetics* (P-63)
- 9:45–10:00 Mrs Aneta Myšková (University of Chemistry and Technology, Czech Republic): *LC-ICP-MS analysis of anti-obesity peptides labeled with lanthanide mass-tag (utilizing a new type of mobile phase compatible with argon plasma)* (P-61)
- 10:00–10:15 Ms Pia Schraml (University of Regensburg, Germany): *Studying aptamer-modified liposomes as control reagent in lateral flow assays* (P-69)
- 10:15–10:30 Ms Sofiia Ivakh (Charles University, Czech Republic): *Determination of nicarbazin in acetonitrile-based media using differential pulse voltammetry and capillary electrophoresis with amperometric detection* (P-100)

10:30–10:45

**Coffee Break**

10:45–11:00

**Session 6** • chairperson: Mrs Lucie Pražáková  
Mr Peter Čambal (Charles University, Czech Republic):  
*Electrochemical characterization of scaife polished {110}-oriented boron doped diamond electrodes (P-3)*

11:00–11:15

Ms Carina Dobner (University of Regensburg, Germany):  
*Tagging of HRP-entrapping liposomes with proteins to enable highly sensitive photometric immunoassays (P-67)*

11:15–11:30

Mrs Sára Hermochová (University of Chemistry and Technology, Czech Republic): *Characterization of electrochemically visualized latent fingerprints (P-16)*

11:30–11:45

Mrs Valérie Smelíková (University of Chemistry and Technology, Czech Republic): *Formation of molecule/metal surface complexes and their effect on SERS-spectra in the systems of amphetamine-based drugs and colloidal nanoparticles (P-54)*

11:45–12:00

Ms Karolina Ogórek (Warsaw University of Technology, Poland): *Studying the GHK-Cu tripeptide loaded liposomes using CE-ICP-MS/MS (P-84)*

12:00–12:15

Mr Natan Horáček (Charles University, Czech Republic):  
*An automatic and unsupervised artificial peak detection approach for preprocessing GC-MS and GC×GC-MS metabolomic data (P-96)*

12:15–13:00

**Lunch**

13:00–13:15

**Session 7** • chairperson: Mr Michal Zelenský  
Mr Mikuláš Vlk (Charles University, Czech Republic):  
*Effect of side chain functional groups on nitrile imine cross-linking in peptide gas-phase ions (P-56)*

13:15–13:30

Ms Laura Deml (University of Regensburg, Germany):  
*Development of microfluidic optical sensing technology for the detection of H<sub>2</sub>O<sub>2</sub> in cell-based bioassays (P-58)*

13:30–13:45

Ms Lucia Molnárová (Charles University, Czech Republic):  
*Monitoring pharmaceuticals and personal care products in surface water samples on the territory of the Czech Republic and Slovakia by LC-MS/MS method to estimate their potential health risk (P-55)*

13:45–14:00

Ms Marta Stępień (Warsaw University of Technology, Poland):  
*Monitoring of platinum drug-loaded liposome changes by CE-ICP-MS/MS (P-75)*



- 14:00–14:15 Ms Nikol Vlčková (Charles University, Czech Republic):  
*Development of a novel hydride atomizer based on atmospheric pressure glow discharge for atomic absorption spectrometry* (P-22)
- 14:15–14:30 Mr Michal Zelenský (Charles University, Czech Republic):  
*Electrochemical study of adsorption properties of boron doped diamond electrodes* (P-83)
- 14:30–14:45 Ms Sabrina Schönemeier (University of Regensburg, Germany):  
*Analysis of degradation reactions in lithium-ion cell electrolytes during thermal and electrochemical aging* (P-9)
- 14:45–15:00 **Coffee Break**
- Session 8 • chairperson: Mr Peter Čambal**
- 15:00–15:15 Mrs Izabela Anna Nasilowska (Warsaw University of Technology, Poland): *Mordant metals used in cultural heritage objects: characterisation and identification by ESI-MS/MS* (P-81)
- 15:15–15:30 Ms Daniela Janstová (University of Chemistry and Technology, Czech Republic): *Optimization of Raman spectroscopy for comprehensive analysis of ex vivo colorectal tissue samples and diagnostics* (P-30)
- 15:30–15:45 Mr Matěj Kmetík (University of Chemistry and Technology, Czech Republic): *Real-time monitoring of acetaminophen transformations using advanced Raman spectroscopy techniques* (P-51)
- 15:45–16:00  Mr Michał Świdorski (University of Lodz, Poland):  
*Electroanalysis of thymoquinone* (P-78)
- 16:00–16:15 Ms Katja Riedel (University of Regensburg, Germany):  
*Development of highly sensitive enzyme-encapsulating liposomes for the Point-of-care* (P-87)
- 16:15–16:25 **Closing ceremony**

## Lunch

Lunch is served in room G2 (the second door on the left of the entrance to the building) in the building Albertov 6 (building opposite the entrance to the Institute of Chemistry). A joint departure for lunch will be organized.

Lunch is provided for the following participants, who have requested it during registration:

Ms Michaela Aichinger	Ms Karolina Ogórek
Ms Eva Bláhová	Mrs Lucie Pražáková
Mr Peter Čambal	Ms Svetlana Pucovski
Ms Laura Deml (veg.)	Ms Katja Riedel (veg.)
Ms Carina Michaela Dobner (veg.)	Mr Petr Rudolf
Ms Lucie Dostálková	Ms Sabrina Schönemeier (veg.)
Ms Vivien Fleischmann	Ms Pia Schraml (veg.)
Mrs Sandra Gierlich (veg.)	Mrs Valerie Smeliková
Mr Václav Helán	Ms Inga Sowik (veg.)
Mrs Sára Hermochová	Ms Marta Katarzyna Stępień (veg.)
Mr Natan Horáček	Mr Martin Šefčík
Ms Sofii Ivakh (veg.)	Mrs Alice Šimonová
Ms Daniela Janstová	Mr Jan Vališ (veg.)
Ms Kristýna Jelšíková	Mr Vojtěch Vilím
Mr Matěj Kmetík	Ms Nikol Vlčková
Mr Ivan Kopal	Mr Mikuláš Vlč
Mrs Aneta Myšková	Ms Katharina Weiss
Mrs Izabela Anna Nasilowska	Mr Michal Zelenský

## Menu

### Thursday, September 19, 2024

- Caprese chicken with smashed potatoes
- *vegetarian*: pea risotto, grana padano

### Friday, September 20, 2024

- roasted chicken with honey and ginger, coleslaw, bread
- *vegetarian*: carrot pancakes with smoked tofu, salad



