



# Program of the XX. Workshop of Biophysical Chemists and Electrochemists

---

**17<sup>th</sup> and 18<sup>th</sup> September, 2020**

under the auspices

the dean of the Faculty of Science MU, Assoc. Prof. Mgr. Tomáš Kašparovský, Ph.D.

**MASARYK  
UNIVERSITY**



**MUNI  
FACULTY  
OF SCIENCE**



**Motto:**

*“The love of science is the love of truth, because honesty is a fundamental virtue of scientists“*

*Ludwig Feuerbach*



## SPONSORS



The main sponsor



SPOL. S R.O.



*Dear friends, dear colleagues,*

As you know, due to the coronavirus pandemic, this year's jubilee, 20th Workshop of Biophysical Chemists and Electrochemists was postponed from the summer term to the autumn one. The coronavirus situation of the last few days is not entirely clear and it is necessary from the point of view of your protection to observe stricter hygienic recommendation and to maintain a disinfected environment for the whole two days of the conference. Together, we will certainly be able to do it together and protect ourselves from COVID-19 (using masks, keeping a distance, frequent disinfection of hands, especially before eating, etc.). Although the course of the conference is influenced by this situation, we wish you the conference filled with many interesting presentations, both in the form of lectures or posters. We wish students and young scientists competing in the Youth Section successful presentations that can be finalized by winning both Awards (the Metrohm Award and the Emil Paleček Award).

According to the attached program you can see the schedule of plenary lectures, invited lectures as well as oral presentations of young scientists. During the conference we will remember also 90<sup>th</sup> birthday anniversary of Prof. Emil Paleček, the famous Czech electrochemist who worked in Brno and devoted his career to electrochemistry of biologically important substances, especially of nucleic acids. The conference will also include presentations of posters and companies which financially support the event. Special thanks go to two main sponsors, the Metrohm and the Biophysical Institute which financially participates in the Emil Paleček Award. All participants are invited to the Poster Session followed by the gala dinner on Thursday afternoon. On Friday, the conference will be concluded with the announcement of three winners of the “Young Scientists’ Session”, one winner of Emil Paleček Award and one winner of the Poster Session.

We are confident that our 20th Workshop of Biophysical Chemists and Electrochemists (WOBICE) will be memorable for its scientific quality, also thanks to your contributions. We do hope that you will welcome the opportunity to present and discuss your scientific results with respect to the Heyrovsky’s logo: *“Experimenting to knowledge, learning to progress.”*

***Welcome to Brno (Masaryk University) and enjoy this conference!***

***Don't forget to protect yourself from COVID-19!***

Libuše Trnková

**Thursday 17<sup>th</sup> of September, 2020**

**8:00 – 8:50 REGISTRATION**

**9:00 – 9:10 OPENING CEREMONY**

*Assoc. Prof. Tomáš Kašparovský, Ph. D. (the Dean of the Faculty of Science, Masaryk University), Assoc. Prof. Ctibor Mazal, CSc. (the Director of the Department of Chemistry) Prof. RNDr. Libuše Trnková, CSc. and Doc. RNDr. Eva Bártoová, Ph. D., DSc. (the Director of the Institute of Biophysics of the CAS)*

**PLENARY LECTURES**

**Chairman – Prof. RNDr. Libuše Trnková, CSc.**

**9:10 – 9:50 Radek Šachl**

RELATING IN-MEMBRANE OLIGOMERIZATION NUMBERS OF PROTEINS TO THEIR FUNCTION

**9:50 – 10:30 Petr Skládal**

BIOSENSORS: WHERE ARE THE LIMITS?

**10:30 – 11:00 COFFEE BREAK**

**INVITED LECTURES**

**Chairman – Assoc. Prof. RNDr. Petr Skládal, CSc.**

**11:00 – 11:20 Antonín Hlaváček**

PHOTON-UPCONVERSION SCANNER FOR MULTIPLEXED IMAGING

**11:20 – 11:40 Jan Příbyl**

MECHANICAL PROPERTIES OF BIO-SAMPLES EXPLORED BY ATOMIC FORCE MICROSCOPY

**11:40 – 12:00 Michal Dudák - ANAMET**

COMPARISON OF CONCENTRATION MEASUREMENTS USING NEW MULTI-ANGLE DLS AND NANOPARTICLE TRACKING FROM MALVERN PANALYTICAL

**12:00 – 12:30 COFFEE BREAK**

**12:30 – 13:00 PRESENTATION OF COMPANIES**

**13:00 – 13:20 Traditional photo**

**13:30 – 14:45 LUNCH**

**YOUNG SCIENTISTS' SESSION**

**Chairman – Mgr. Antonín Hlaváček, Ph. D.**

**14:45 – 15:05 Eliška Odstrčilíková**

PHOTON-UPCONVERSION NANOPARTICLES AS A BACKGROUND-FREE LABEL FOR THE DETECTION OF BIOMARKERS AND BACTERIA

*15:05 – 15:25* **Vladimír Jonas**

DEPOSITION OF DRIED COLLOIDAL SUSPENSION VIA NANOELECTROSPRAY

*15:25 – 15:45* **Šárka Turová**

PEDOT: DBSA AS A REPLACEMENT MATERIAL FOR PEDOT: PSS

*15:45 – 16:05* **Aneta Marková**

HOW THE SERIES RESISTANCE INFLUENCE THE TRANSCONDUCTANCE OF THE OECT PLANAR STRUCTURE

*16:05 – 16:25* **Jan Sokolov**

FUNCTIONALIZED CHIRAL BAMBUSURILS: SYNTHESIS AND HOST-GUEST INTERACTIONS WITH CHIRAL CARBOXYLATES

***16:25 – 16:55 COFFEE BREAK***

***16:55 - 17:55 POSTER SESSION***

***Chairman – Prof. Ing. René Kizek, DrSc.***

*Presentations of posters THE AUTHORS OF POSTERS REGISTRED IN COMPETITION WILL PREPARE A SHORT (max. 3 MINUTES) PRESENTATION AT THEIR POSTERS. THE AUTHORS OF THE OTHER POSTERS WILL PRESENT THEIR POSTERS INDIVIDUALLY.*

***18:00 WELCOME PARTY***

**Friday 18<sup>th</sup> of September, 2020**

**PLENARY LECTURES**

**Chairman – Prof. RNDr. Libuše Trnková, CSc.**

9:00 – 9:40 **Jiří Ludvík**  
ELECTROCHEMISTRY FOR SINGLET FISSION

9:40 – 10:20 **Petr Slavíček**  
SPECTROSCOPY APPROACH TO ELECTROCHEMISTRY

**10:20 – 10:50 COFFEE BREAK**

**INVITED LECTURES**

**Chairman – RNDr. Jozef Hritz, Ph. D.**

10:50 – 11:10 **Alan Liška**  
REDOX PROPERTIES OF GERMANIUM-BASED PHOTOINITIATORS

11:10 – 11:30 **Josef Houser**  
COMBINATION OF BIOPHYSICAL TECHNIQUES FOR PROTEIN CHARACTERIZATION - CASE STUDY OF ASPERGILLUS FUMIGATUS LECTIN

11:30 – 11:50 **Tadeja Janc**  
ION-SPECIFIC EFFECT ON PROTEINS PROBED BY SURFACE WATER

11:50 – 12:10 **Jozef Hritz**  
CHALLENGES IN STRUCTURAL AND INTERACTION PROPERTIES OF INTRINSICALLY DISORDERED PROTEINS

**12:10 – 12:40 COFFEE BREAK**

**EMIL PALEČEK SESSION**

**Chairman – Assoc. Prof. RNDr. Miroslav Fojta, CSc.**

12:40 – 12:55 **Libuše Trnková**  
REMEMBERING PROF. EMIL PALEČEK

12:55 – 13:15 **Miroslav Fojta**  
RECENT STUDIES REVEAL NEW RELATIONSHIPS BETWEEN THE STRUCTURE AND ELECTROCHEMICAL BEHAVIOR OF NUCLEIC ACIDS

**13:30 – 14:45 LUNCH**

**YOUNG SCIENTISTS' SESSION**

**Chairman – RNDr. Alan Liška, Ph. D.**

14:45 – 15:05 **Daniel Dobrovodský**  
USE OF G-QUADRUPLEX LIGAND AS ELECTROCHEMICAL PROBE IN DNA STRUCTURE RECOGNITION

*15:05 – 15:25 Ludmila Moráňová*

ELECTROCHEMICAL LAMP-BASED ASSAY FOR SCREENING OF HPV16/HPV18  
INFECTION IN CERVICAL SAMPLES

*15:25 – 15:45 Nasim Izadi*

CATALYTIC HYDROGEN EVOLUTION REACTION OF AVIDIN AND NEUTRAVIDIN.  
INFLUENCE OF PROTEIN MODIFICATION AND GLYCOSYLATION

*15:45 – 16:05 Petr Louša*

HOW PHOSPHORYLATION IMPACTS 14-3-3 $\zeta$  DIMERIZATION

***16:05 – 16:30 COFFEE BREAK***

***16:30 ANNOUNCEMENT OF THE COMPETITION WINNERS***

***Libuše Trnková, Peter Barath, Iveta Třísková***

***ANNOUNCEMENT OF THE COMPETITION RESULTS FOR THE BEST POSTERS***

***ANNOUNCEMENT OF THE COMPETITION RESULTS OF THE YOUNG***

***SCIENTISTS' SESSION***

***EMIL PALEČEK AWARD***

***The sponsor of the book prizes: Czech Chemical Society, subdivision Brno.***



## List of posters

- 1. ADTSV DPV DETERMINATION OF INTERACTION BETWEEN CDTE QUANTUM DOTS AND OLIGIONUCLEOTIDES SPECIFIC FOR THE AFRICAN SWINE FEVER VIRUS**  
Dominik BANÁŠ, Ondřej RYCHLÝ, Stefano SALMISTRARO, Ahmet Davut AKSU, Miroslava KRZYŽÁNKOVÁ, Rene KIZEK
- 2. ELECTROCHEMICAL ANALYSIS OF NUCLEIC ACIDS COUPLED WITH ISOTHERMAL AMPLIFICATION TECHNIQUES FOR CANCER DIAGNOSTICS**  
Martin BARTOŠÍK, Ludmila MORÁŇOVÁ
- 3. AUTOMATION OF ARGENTOMETRIC TITRATION**  
Adam BŘEZINA, Ana-Marija ŽAGAR, Přemysl LUBAL, Pavel KRÁSENSKÝ and Marta FARKOVÁ
- 4. INFLUENCE OF ETHANOL ON THE ITP DETERMINATION OF ORGANIC ACIDS IN BEVERAGES**  
Sandra BUGDOLOVÁ, Přemysl LUBAL and Marta FARKOVÁ
- 5. ANTIPROLIFERATIVE, DNA BINDING, AND CLEAVAGE PROPERTIES OF DINUCLEAR Co(II) COMPLEXES CONTAINING THE BIOACTIVE QUINIZARIN LIGAND**  
Hana CRLIKOVA, Hana KOSTRHUNOVA, Jitka PRACHAROVA, Máté KOZSUP, Sándor NAGY, Péter BUGLYO, Viktor BRABEC, Jana KASPARKOVA
- 6. BYPASS OF THE Pt-DNA ADDUCT BY DNA POLYMERASES AND THERMODYNAMIC ASPECTS OF THIS PROCESS**  
Monika HREUSOVÁ, Olga NOVÁKOVÁ, Viktor BRABEC
- 7. S. AUREUS METALLOTHIONENIN ANALYSIS AFTER ITS EXPOSITION TO SILVER AND CADMIUM IONS**  
Dominik BANÁŠ, Vít SKOTÁK, Karel SEHNAL, Branislav RUTTKAY-NEDECKÝ, Marta KEPINSKA, Awais FARID, Carlos FERNANDEZ, Jiří SOCHOR, Mojmír BAROŇ, Rene KIZEK
- 8. DETERMINATION OF NITROGEN IN BONES USING KJELDAHL METHOD**  
Markéta KRATOCHVILOVÁ, Lubomír PROKEŠ, Marta FARKOVÁ
- 9. PHOSPHOMIMICKING MUTANTS: WHY TO BE CAREFUL**  
Alexandra NÁPLAVOVÁ, Aneta KOZELEKOVÁ, Jozef HRITZ
- 10. OPTIMIZATION OF EXPRESSION AND PURIFICATION OF FRAGMENT FROM TAU PROTEIN**  
Klára PLEŠINGROVÁ, Norbert GAŠPARIK, Jozef HRITZ
- 11. ELECTROCHEMICAL ANALYSIS OF ZINC CONTENT IN THE URINE AND ITS REALTION TO PATIENTS WITH PROSTATE CANCER**  
Ondřej RYCHLÝ, Dominik BANÁŠ, Vít SKOTÁK, Martina STANKOVÁ, Michaela VŠETIČKOVÁ, Tomáš PARÁK, Marta KEPINSKA, Vedha HARI, Božena HOSNEDLOVÁ, Branislav RUTTKAY-NEDECKÝ, Rene KIZEK
- 12. SELECTION OF CATIONIC NANOPARTICLES FOR GENE AND PROTEIN DELIVERY AND QUANTIFICATION OF PLASMID/PROTEIN SURFACE ADSORPTION**  
Josef SKOPALÍK, Tomáš HORÁK, Vratislav ČMIEL, Kateřina POLÁKOVÁ, Tomáš PARÁK, Jaroslav PRŮCHA, Karol ŠVÍK, Josef MAŠEK

**13. ELECTROCHEMICAL STUDY OF ALBUMIN IN A BUFFERED ENVIRONMENT AND IN A BIOLOGICAL URINARY SAMPLE**

Vít SKOTÁK, Dominik BANÁŠ, Martina STANKOVÁ, Michela VŠETIČKOVÁ, Branislav RUTTKAY-NEDECKÝ, Carlos FERNANDEZ, Tomáš PARÁK, Marta KEPINSKA, Vedha HARI, Rene KIZEK

**14. APPLICATION OF THE ELIMINATION PRINCIPLE IN SPECTRAL EXPERIMENTS**

Libuše TRNKOVÁ, Iveta TŘÍSKOVÁ

**15. OXIDATION SIGNALS OF INSULIN ON SCREEN PRINTED ELECTRODES**

Iveta TŘÍSKOVÁ, Tadeja JANC, Libuše TRNKOVÁ





INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ