

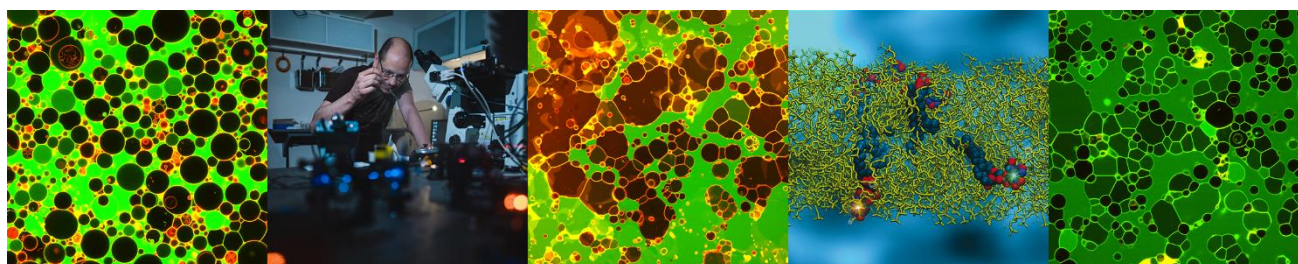
23rd Joint meeting of Biophysical Chemists and Electrochemists,
1. - 2. 11. 2023, Prague



23rd Joint Meeting of Biophysical Chemists and Electrochemists

J. Heyrovský Institute, Prague – Brdička hall

1. – 2. 11. 2023



Acknowledgments

We are grateful to:



SPOL. S R.O.

Organization

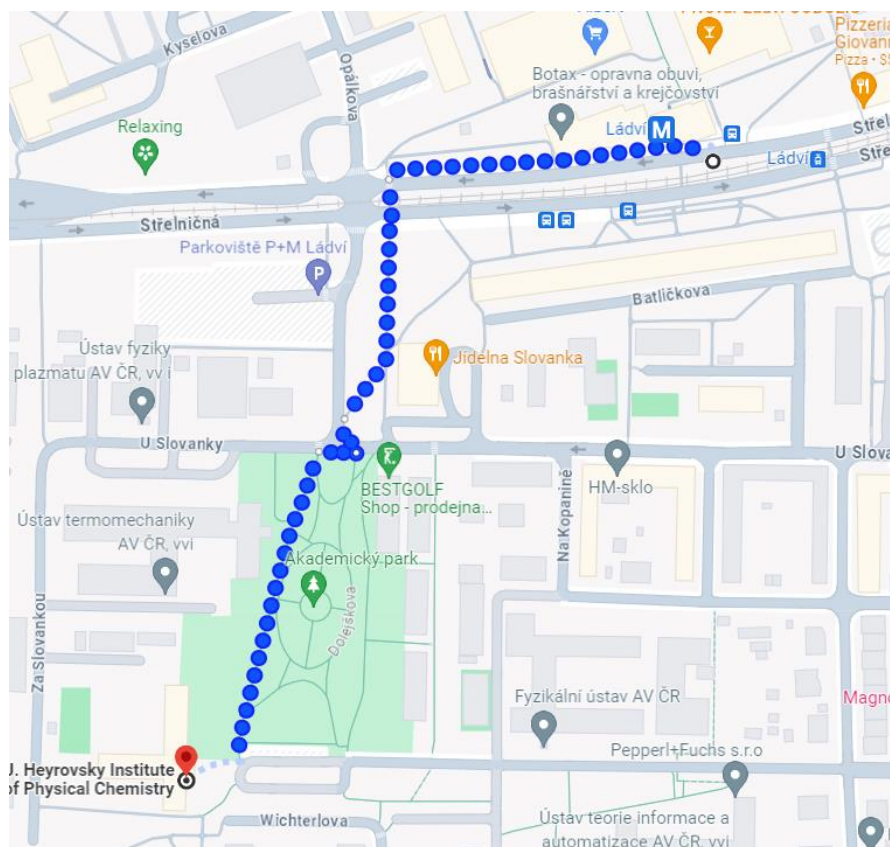
Venue

J. Heyrovský Institute of Physical Chemistry

Dolejšková 2155/3, 182 23 Prague 8,

Czech Republic

www.jh-inst.cas.cz; biophys-electrochem@jh-inst.cas.cz



Main organizers:

Radek Šachl, Jiří Ludvík (JH IPC)

Co-organizers:

Libuše Trnková, Iveta Třísková (MU)

Jan Sýkora, Alan Liška (JH IPC)

Program Overview

Wednesday 1st of November, 2023

08:55 Conference opening

09:00-9:30 **PLENARY LECTURE** Jiří Homola

SESSION 1

THEORY AND SIMULATION

Chairman – Radek Šachl

9:30 – 9:45 **Talk 1** Robert Vácha

9:45 – 10:00 **Talk 2** Štěpán Timr

10:00 – 10:15 **Talk 3** Martin Srnec

10:15 – 10:45 Coffee break 1

SESSION 2

ELECTRODES AND METHODS

Chairman – Miroslav Fojta

10:45 – 11:00 **Talk 4** Karolína Schwarzová

11:00 – 11:15 **Talk 5** Michal Zelenský

11:15 – 11:30 **Talk 6** Anton Lytvynenko

11:30 – 11:45 **Talk 7** Libuše Trnková

11:45 – 12:00 **Talk 8** Ravery Sebuyoya

12:00 – 13:30 LUNCH

SESSION 3

SCATTERING MICROSCOPY AND OTHER METHODS

Chairman – Josef Lazar

13:30 – 13:45 **Talk 9** Petr Cígler

13:45 – 14:00 **Talk 10** Marek Piliarik

14:00 – 14:15 **Talk 11** Miroslav Štěpánek

14:15 – 14:30 **Talk 12** Michal Cifra

14:30 – 14:45 **Talk 13** Tereza Roesel

14:45 – 15:00 **Talk 14** David Roesel

15:00 – 15:30 Coffee break 2

SESSION 4

REDOX ELECTROCHEMISTRY

Chairman – Karolína Schwarzová

15:30 – 15:45 **Talk 15** Přemysl Lubal

15:45 – 16:00 **Talk 16** Alan Liška

16:00 – 16:15 **Talk 17** Metrohm

16:15 – 16:30 **Talk 18** Lucie Koláčná

16:30 – 16:45 **Talk 19** Jakub Šrein

16:45 – 17:00 Coffee break 3

SESSION 5 – STUDENTS' FLASH TALKS

Chairman – Jiří Ludvík

17:00 - 18:30 Student Flash presentations of posters – Emil Paleček Award

18:30 – 21:00 Dinner + POSTER SESSION

Thursday 2nd of November, 2023

09:00-9:30 PLENARY LECTURE Miroslav Fojta

SESSION 6

BIOPHYSICS AND ELECTROCHEMISTRY

Chairman – Ludmila Šimková

9:30 – 9:45 Talk 20 Soňa Boháčová
9:45 – 10:00 Talk 21 Marcel Fuciman
10:00 – 10:15 Talk 22 Jiří Ehlich

10:15 – 10:45 Coffee break 4

SESSION 7

RNA AND DNA DAMAGE

Chairman – Petra Riegerová

10:45 – 11:00 Talk 23 Eva Bárťová
11:00 – 11:15 Talk 24 Monika Hermanová
11:15 – 11:30 Talk 25 Niklas Hansen
11:30 – 11:45 Talk 26 Oleg Lunov
11:45 – 12:00 Talk 27 Eric Glowacki

12:00 – 13:30 LUNCH

SESSION 8

CHEMISTRY IN BIOPHYSICS

Chairman – Jan Sýkora

13:30 – 13:45 Talk 28 Roman Tůma
13:45 – 14:00 Talk 29 Jan Vacek
14:00 – 14:15 Talk 30 Mario Vazdar
14:15 – 14:30 Talk 31 Jan Heyda
14:30 – 14:45 Talk 32 Magdalena Čapková
14:45 – 15:00 Talk 33 Tomas Fessl

15:00 – 15:30 Coffee break 5

SESSION 9

MISCELLANEOUS

Chairman – Mario Vazdar

15:30 – 15:45 Talk 34 Peter Mojzeš
15:45 – 16:00 Talk 35 Maria Hoernke
16:00 – 16:15 Talk 36 Hana Lísalová
16:15 - 16:30 Talk 37 Josef Lazar
16:30 - 16:45 Talk 38 Radovan Fišer
16:45 - 17:00 Talk 39 Anna Fučíková

17:00 CLOSING REMARKS

Scientific program - Wednesday 1st of November, 2023

08:50 OPENING (Radek Šachl, Jiří Ludvík)

09:00-9:30 PLENARY LECTURE

Jiří Homola Plasmonic biosensors and their applications

SESSION 1 THEORY AND SIMULATION

Chairman – Radek Šachl

9:30 – 9:45	Robert Vácha	Counterintuitive Binding of Phosphorylated DEP Domain to Negatively Charged Membranes
9:45 – 10:00	Štěpán Timr	Molecular simulations of liver phosphofructokinase 1 provide insight into the role of its C-terminal tail
10:00 – 10:15	Martin Srnec	Off-diagonal thermodynamics and its effect on reactivity

10:15 – 10:45 Coffee break 1

SESSION 2 ELECTRODES AND METHODS

Chairman – Miroslav Fojta

10:45 – 11:00	Karolína Schwarzová	Coupled dehydration-electrochemical oxidation of primary bile acids
11:00 – 11:15	Michal Zelenský*	Characterization of laser treated polycrystalline BDD electrodes with various sp ² /sp ³ carbon ratio
11:15 – 11:30	Anton Lytvynenko	Metal/polyaniline composite electrodes for electrochemical detection of aliphatic alcohols
11:30 – 11:45	Libuše Trnková	Recent development and application of elimination voltammetry with linear scan
11:45 – 12:00	Ravery Sebuyoya*	Electrochemical dual detection platform for analysis of BRAF V600E point mutation in clinical samples using isothermal amplification techniques

12:00 – 13:30 LUNCH

SESSION 3 SCATTERING MICROSCOPY AND OTHER METHODS

Chairman – Josef Lazar

13:30 – 13:45	Petr Cígler	Designing the interface of nanoprobe operating in biological environments
13:45 – 14:00	Marek Piliarik	Label-free interferometric scattering microscopy and spectroscopy with single-molecule sensitivity
14:00 – 14:15	Miroslav Štěpánek	Application of scattering methods for studying structure and dynamics on the nanoscale
14:15 – 14:30	Michal Cifra	Exploring the Impact of High-Intensity Pulsed Electric Field on Cytoskeletal Proteins: from Simulations to Experiments
14:30 – 14:45	Tereza Roesel	Nanofluidic Scattering Microscopy for label-free single-molecule detection of biomolecules in free motion
14:45 – 15:00	David Roesel	Dynamic second harmonic imaging of divalent cation translocation through giant vesicle membranes

15:00 – 15:30 Coffee break 2

SESSION 4 REDOX ELEKTROCHEMIE

Chairman – Karolína Schwarzová

15:30 – 15:45	Přemysl Lubal	Thermodynamics of chelate effect of Pd(II)-oxalate system
15:45 – 16:00	Alan Liška	Combining electro- and photochemistry: acyl compounds of the 14th group elements for medical use
16:00 – 16:15	Metrohm	TBA
16:15 – 16:30	Lucie Koláčná	Copper(II) Azamacrocyclic Complexes for Medical Applications
16:30 – 16:45	Jakub Šrein*	Copper complexes of phenolate-bridged dimeric cyclam ligand.

SESSION 5 – STUDENTS' FLASH TALKS

Chairman – Jiří Ludvík

17:00 - 18:30 Student Flash talks – Emil Paleček Award

G. Aktug**	Continuous Monitoring Affinity Plasmonic Biosensor for Low Molecular Weight Analytes with the Use of Flexible Polymer Linkers
M. Beneš**	New psychoactive substance 25E-NBOH - electron transfer properties
A. Blum**	pH-sensitive polymers for drug delivery induce electrostatic lipid clustering, membrane permeability, aggregation and fusion of vesicles
P. Čambal**	Electrochemical properties of single-crystal boron doped diamond electrodes with vicinal crystal orientations and their application in electroanalysis
D. Cattozzo Mor**	Multi-Responsive Photocrosslinked Hydrogels for Actuating and Sensing Applications

B. Chmelová**	Interpretation of STED-FCS diffusion law plots for nanoscopically heterogeneous membrane
T. Dobrovolná**	Transition metal ion complexes of triazacyclononane bearing fluorinated pendant arms as potential redox active ¹⁹ F MRI “smart” contrast agents
Husein Evcı**	Ionic Strength and Solution Composition Dictate the Adsorption of Cell-Penetrating Peptides onto Phosphatidylcholine Membranes
S. Frederick**	Visualizing the Sub-diffraction Manipulation of Light by Plasmons using Single-Molecule Localization Microscopy
A. Hlinčík**	Character of Cr-Cr bond in the SIYNAQ complex
E. Jiroušková**	New psychoactive substances, electrochemistry and spectroelectrochemistry
Z. Johanovská**	Micromanipulation of giant lipid vesicles as a new tool for the research of biomembrane structures and its mechanical properties
I. Kopal**	Unveiling the Behaviour of 4-Aminobenzenethiol Using a Combination of Interferometric Scattering Microscopy and Raman Spectroscopy
X. Li**	Unique insights into the electrode/electrolyte interface of boron-doped diamond electrodes
S. Müllerová**	Side on and end on interaction between iron/chromium decorated circumcoronenes and hydrogen molecule
V. Pavelka**	Characterization and optimization of SERS substrates using adenine as benchmark molecule and automation of data evaluation
D. Sklenářová**	Detection of prostate-specific antigen utilizing immunomagnetic assay with upconversion nanoparticles
V. Smeliková**	Creation of Molecule-metal Surface Complexes and their Effect on SERS spectra in the Systems of Amphetamine based Drugs and Colloidal Nanoparticles
K. Šťastná**	Plasma activated water for agriculture application: first evidence about its effects to soil microbial communities and soil enzymatic activity
D. Šťastný**	Probing local protein/peptide microenvironment by GP-FRET
K. Umar**	High resolution near infrared imaging with DNA-PAINT
Vandana**	Investigating Functional and Dysfunctional Oligomeric States of Membrane-Associated Protein Oligomers Forming Membrane Pores on Giant Lipid Vesicles

18:30 – 21:00 Dinner + POSTER SESSION

* student lecture eligible for Emil Paleček Award

** student flash talk eligible for the award of the Czech Biophysical Association

Scientific program - Thursday 2nd of November, 2023

09:00-9:30 PLENARY LECTURE

Miroslav Fojta: DNA structure at electrodes: possible challenges and ways to overcome them

SESSION 6 BIOPHYSICS AND ELECTROCHEMISTRY

Chairman – Ludmila Šimková

9:30 – 9:45	Soňa Boháčová	Electron-Poor Acridones and Acridiniums as Super Photooxidants in Molecular Photoelectrochemistry by Unusual Mechanisms
9:45 – 10:00	Marcel Fuciman	Changes of ICT State Dynamics of 8'-apo-β-Carotenal Induced by Bulk Electrolysis
10:00 – 10:15	Jiří Ehlich	Characterization of Electrochemical Reactions on PtIr Neuromodulation Electrodes

10:15 – 10:45 Coffee break 4

SESSION 7 RNA AND DNA DAMAGE

Chairman – Petra Riegerová

10:45 – 11:00	Eva Bártová	RNA modifications and repair of damaged genome
11:00 – 11:15	Monika Hermanová	Complexes of DNA oligonucleotides and DNA components with mercury ions
11:15 – 11:30	Niklas Hansen*	A versatile DNA-based platform for investigating interactions between plasmonic nanoparticles and fluorescent nanodiamonds
11:30 – 11:45	Oleg Lunov	Mechanical regulation of hepatic tumor cell functions
11:45 – 12:00	Eric Glowacki	The Faraday Scalpel: on-demand manipulation of oxygen, reactive oxygen species, and pH in biological environments

12:00 – 13:30 LUNCH

SESSION 8 CHEMISTRY IN BIOPHYSICS

Chairman – Jan Sýkora

13:30 – 13:45	Roman Tůma	Light-driven chemistry inside a phage head
13:45 – 14:00	Jan Vacek	Lipid Membrane Behavior of Nitro-Fatty Acids and their Loading into POPC Liposomes to Activate Nrf2 Pathway
14:00 – 14:15	Mario Vazdar	The Role of EDTA in Adsorption of Peptides on Model Biological Membranes
14:15 – 14:30	Jan Heyda	Salt effects on N-isopropylacrylamide in aqueous solutions
14:30 – 14:45	Magdalena Čapková*	Binding inhibition assay: theoretical and experimental optimization
14:45 – 15:00	Tomáš Fessl	Energy landscape steering mediates dynamic coupling in ATP-driven protein translocation by the bacterial Sec machinery

15:00 – 15:30 Coffee break 5

SESSION 9 MISCELLANEOUS

Chairman – Mario Vazdar

15:30 – 15:45	Peter Mojzeš	Crystalline purines in unicellular eukaryotes: How Raman microscopy can contribute to understanding their origin, composition, and functions
15:45 – 16:00	Maria Hoernke	Mechanisms of lipid membrane perturbations by antimicrobial polymers and a misleading side-effect
16:00 – 16:15	Hana Lísalová	Zwitterionic Polymer Brushes as Biofunctional Antifouling Nano-coatings for Real-world Public-health Applications
16:15 - 16:30	Josef Lazar	Optical directionality of fluorescent proteins: fundamentals and applications
16:30 - 16:45	Radovan Fišer	Membrane pore characterization using non-electrolytes
16:45 - 17:00	Anna Fučíková	What can we learn from comparative characterization of materials on the macro- and nano-scale

17:00 CLOSING REMARKS (Jiří Ludvík, Radek Šachl)

* student lecture eligible for Emil Paleček Award