

## PROGRAM

**Intensive Course 22-31 May 2024 CEEPUS**, In the frame of RO-0010-18-2324 network,  
*Teaching, and Learning Bioanalysis* CEEPUS Network (coordinator Jolan Harsfalvi)  
**Semmelweis University Institution of Biophysics and Radiation Biology**

### **BIO- AND SINGLE MOLECULAR ANALYSIS FROM BASICS TO PRACTICE**

Semmelweis University Basic Medical Science Center, Room 1.205,

**Days started with lectures at 9 am, continued with practices, ended** with quizzes of the lecturers and demonstrators, and **closed at 5 pm**\*<sup>1</sup>. The student with the most correct answer was awarded a Semmelweis flask.

#### **D1**

ARRIVAL to Budapest

#### **D2**

Welcome **Gabriella Donath Nagy, Jolán Hársfalvi**,

Introduction of the **Students**

Periodic phenomena and pattern formation in chemical and biological systems (**Gabriella Donáth-Nagy**)

Protein structure determination in solution with X-ray and neutron small-angle scattering. Hands-on experience in interpreting structural biology data (**Bence Fehér**)

Protein structure determination in solution with X-ray and neutron small-angle scattering. Hands-on experience in interpreting structural biology data (**Bence Fehér**)

Nanomanipulation of single viruses (**Bálint Kiss**)

#### **D3**

From single molecules to the living organism. Passion for discovery and value-driven leadership (**Miklós Kellermayer**)

Semmelweis University and Budapest (**Bálint Budavári**)

Resonance theory and practice in small groups at 7 working places (**Ádám Zolcsák**)

Békésy György Reserach Center Atomic force microscopy (AFM) (**Ádám Zolcsák**)

Practice: preparation of a multimer protein and its AFM analysis (**Jolán Hársfalvi**)

#### **D4**

Explore links between bioanalysis and biophysics, force sensing during primary hemostasis.

Practice: preparation of a multimer protein and its AFM analysis (**Jolán Hársfalvi**), Atomic force microscopy (AFM) (**Ádám Zolcsák**)

Universal method for synthesis of artificial gel antibodies by the imprinting approach combined with a unique electrophoresis technique for detection of minute structural differences of proteins, viruses, and bacteria (**Anikó Takátsy**)

#### **D5**

Visiting museums: Natural History Museum; Semmelweis History of Medicine; Hospital in The Rock Nuclear Bunker. (Show contexts of the Course and science in Hungary.)

#### **D6**

All-atom simulation of biological macromolecules (**Erika Balog**)

In silico biophysics of transmembrane proteins (**Tamás Hegedüs**)

Analytical and biomedical applications of molecularly imprinted polymers (**Ede Bodoki**)

---

<sup>1</sup> \*To meet the students' requirements, the duration of the lectures and demonstrations are not limited strictly, but a short lunchtime before 2 pm is obligatory.

Demonstration of electrochemical sensing using a portable electrochemical system (**Bogdan Cezar Iacob**)

[Békésy György](#) Research Center, Demonstrations and measurement options (Optical tweezers, Optical microscopy, Optical spectroscopy (**Balazs Kretzer**))

**D7**

Phosphorylation-dependent structure of titin (**Zsolt Mártonfalvi**)

Nanochemistry and its medical applications (**Angéla Jedlovszky-Hajdu**)

Laboratory visit & work *Bálint Budavári, Kristóf Molnár, Sarolta Halmóczy, Veronika Pálos, Ákos Juhász*)

How to develop an HPLC separation method for pharmaceutical quality control (**Martin Schmid**)<sup>2\*\*</sup>

Live demonstration of how to compare analysis results of real Viagra samples with fakes (**Martin Schmid**)<sup>\*\*</sup>

**D8**

Recent advances in chiral analysis (**Gergő Tóth**)<sup>\*\*</sup>

HPLC measurement by students in 4 groups in the laboratory (**Gergő Tóth**)<sup>\*\*</sup>

Practical method development in capillary electrophoresis (**Tomas Krizek**)<sup>\*\*</sup>

Showing quantitative *in vivo* molecular Imaging center with an explanation of the Instruments and presentation of an animal experiment (**Noémi Kovács**),

**D9**

Békésy György Research Center Fluorescent- and Optical microscopy, Spectroscopy (**Jolán Hársfalvi**)

**D10** LEAVE for home

---

<sup>2 \*\*</sup> ALL IN [Department](#) of Pharmaceutical Chemistry, Faculty of Pharmacy, Semmelweis University, 1092 Budapest, Hőgyes Endre u. 9