

Methodological advances in molecular and structural biology II

Summer semester of the academic year 2022/2023

Scientific coordinators: Janusz M. Bujnicki, Andrzej Dziembowski, Gracjan Michlewski

Administrative coordinator: Iwona Pilecka (ipilecka@iimcb.gov.pl)

Lecture language: English

Type: stationary

Time: Tuesdays 14:00-15:30

Place: Institute of Biochemistry and Biophysics of the Polish Academy of Sciences, Pawińskiego 5a, Warsaw, conference room A (room 7 in block A)

Course credit: 3 ECTS points

The credits for this course are granted upon successful passing of an online exam (30 single-choice questions). In-person presence on minimum 11 out of 15 lectures will be rewarded by two bonus points at the exam (equivalent of two correctly answered questions).

Lectures

- 28.02.2023 – D. Cysewski – Proteomics and Metabolomics - introduction to experimental and computational methods I
- 07.03.2023 – W. Pokrzywa – Ubiquitin signalling: degrons, in vitro ubiquitylation, proteasome
- 14.03.2023 – M. Bochtler – Structural biology and biophysics of nucleic acids (DNA structure, B-DNA, A-DNA, Z-DNA, dsRNA, heteroduplexes, cruciform structures, Holliday junction, RNA and DNA modifications)
- 21.03.2023 – G. Michlewski – Methods that probe RNA structure and interactome in cells (CLIP, RNP Capture, SHAPE) and methods used to analyse macromolecular interactions in cells (e.g. FRET, FISH)
- 28.03.2023 – M. Nowotny – Introduction to structural biology and biophysics of nucleic acids. Basic interactions, motifs, examples of biochemical and biophysics studies on nucleic acids and their complexes
- 04.04.2023 – M. Nowotny – Introduction to structural biology and biophysics of proteins. Basic interactions, structural principles, domains, examples of biochemical and biophysics studies
- 11.04.2023 – M. Czarnocki-Cieciura – High-resolution methods of structural biology: macromolecular crystallography (MX), cryo-electron microscopy (cryo-EM) and nuclear magnetic resonance spectroscopy (NMR)
- 18.04.2023 – D. Cysewski – Proteomics and Metabolomics - introduction to experimental and computational methods II
- 25.04.2023 – J.M. Bujnicki – Structural bioinformatics and protein structure modelling: historical perspective, best approaches, what is currently possible and what is not yet possible
- 09.05.2023 – M. Bochtler – Structural bioinformatics and protein structure modelling: links between AlphaFold and other areas of machine learning
- 16.05.2023 – J.M. Bujnicki – Structural bioinformatics and RNA structure modelling
- 23.05.2023 – F. Stefaniak – What is cheminformatics and why do we need it? Basic concepts of cheminformatics (structural similarity, modelling of 3D structures, partial charges). Prediction of physicochemical parameters of small molecules and why those are important. Tools used for basic cheminformatics operations
- 30.05.2023 – A. Gołębiowski – Translational methods / medical applications (lecturer online)

06.06.2023 – J. Kuźnicki – Best practices in data presentation, writing of scientific papers and grant proposals in the area of biochemistry and molecular biology

13.06.2023 – G. Michlewski – Best practices in critical assessment of scientific data in the area of biochemistry and molecular biology