

Single molecule biophysics in cell lysates

13th-17th May 2024

Institute of Biotechnology, Czech Academy of Sciences, Vestec, Czech Republic
(MoB-IBT)

This basic-level school is aimed at biologists, biophysicists, biochemists, structural biologists, etc., who want to learn a technique enabling high throughput screening for dynamic parameters of biochemical interactions on a single molecule level.

Single molecule imaging techniques enable following bio-molecular interactions with unprecedented resolution. Following single molecules in cells is often challenging due to the complex geometry of the intracellular environment. By contrast, in in vitro reconstituted systems, comprising only few bio-molecules of interest, single molecule imaging is achievable e.g. by placing the sample in close vicinity of a glass surface and using Total Internal Reflection Fluorescence (TIRF) microscopy. However, the main obstacle of this method is obtaining functional bio-molecular samples in high enough quantity and purity. During the Basic Level School, we will explore an experimental approach combining the best of the two worlds by imaging bio-molecular interactions with single molecule resolution in cell lysates. This method employs the usage of established in vitro methods, such as TIRF imaging, while not being dependent on laborious sample preparation, and, importantly, enables following single molecule dynamics in the presence of other cellular components. Hands on training will be provided on TIRF-based single molecule imaging in cell lysates and basic image analysis of the acquired data. As an example, for one experimental system we will explore interactions between microtubules and microtubule-associated proteins, such as molecular motors.

Invited speakers: Carsten Janke, *Institut Curie* & Tim Mitchison, *Harvard Medical School*

The course will combine both theoretical and practical content, starting with a short introductory round and theoretical lectures and will then continue with hands-on microscopy and data analysis sessions. Finally, there will be presentations of the acquired results.

Other details: The course is aimed at trainees with little experience in the domain and/or people wanting to acquire new scientific and technical skills: graduate and PhD students, post-doctoral fellows, early career scientists, technicians, core facility staff.

Visit the website to find out more and to apply to take part in the course.

<https://www.mosbri.eu/training/basic-level-schools/bls2/>