

Bruker Nano

Thursday, March 23, 2023
14:00 - 15:00, Lecture Hall 104

Multi-Scale Imaging: from molecules to organisms using Bruker Super-Resolution and Light Sheet Microscopy

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LCS SPIM – Light Sheet Microscopy for Large Cleared Samples
Light sheet microscopy has become the state of the art methodology to address a wide variety of biological questions. Key features of this technique are the extremely minimized photo bleaching, the high-speed image acquisition, and the large imaging depth. In parallel, more and more sophisticated techniques for tissue clearing have been developed over the last years. Tissue clearing renders biological samples transparent, a prerequisite for optical imaging in large (e.g. mesoscopic) samples.

The combination of cleared tissues with light sheet microscopy is an ideal synergy that allows addressing new questions in biology. In this workshop, participants will be familiarized with tissue clearing, and preparation of large samples. Different imaging strategies will be discussed and participants will learn how to mount the sample accordingly, adjust all necessary parameters to achieve the best quality, acquire a tiled acquisition, process (i.e. stitch) and visualize the data.

Vutara VXL - Superresolution Microscopy

Modern fluorescence microscopy applications need to be performed under conditions that resemble the natural environments of the structures of interests. This requires using large samples, like tissue slices or even whole model organisms, instead of the classical cell cultures. One of the main limitations of most super-resolution microscopes is their weak ability to image structures in great depth of the sample.

The Bruker Vutara VXL system is different in that sense, as it allows to resolve structures in 3D at 20 nm resolution in up to 30 μm depth inside a neurobiological sample. This is ideal for studying the distribution of pre- and postsynaptic proteins or the cytoskeleton architecture of cells embedded in their native environment.

This part of the workshop will provide application examples from neurobiology and demonstrate the capabilities of the SRX software in data analysis and processing.



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