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High throughput light-sheet microscopy for delicate and large samples – and how to handle the data

Presenters:

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Abstract:

Light-sheet microscopy comes in different flavours, adapting its geometry to the needs of biological samples. General key features of light-sheet microscopy are the extremely minimized photo-toxicity, the high speed image acquisition, and the large imaging depth. This allows for imaging delicate samples in a volumetric manner over long time. Fast cellular processes and interactions can be observed in the comprehensive context of an organ or organoid.

As the imaging speed is very fast, several samples can be imaged in one session. Prerequisite is a sample mounting system that allows multiple samples being accessible to the microscope in one go, or the need for a robot-supported exchange of the samples.

Bruker has a wide portfolio of different light-sheet geometries, but in this session we focus on two specific flavours, the Luxendo TruLive3D Imager and the Luxendo LCS SPIM.

Dedicated to live imaging, the TruLive3D Imager is a microscope that is optimized for long-term 3D fluorescence imaging of living specimens. Its maximized photon efficiency, and short illumination times enable long-term imaging under ideal environmental conditions. The optical performance combined with the compartmentalized multi-sample holder allows for high throughput imaging in different media under the same environmental conditions in one experiment.

Designed to address large cleared samples, the LCS SPIM can accommodate several cleared samples at the time. Typical samples are cleared mouse organs that can be imaged in their full depth. The unique cuvette based mounting system can be combined with a robotics approach to further increase the throughput and can therein facilitate clinical studies.

Creating large amounts of data generates the need for storing, processing, and managing them. The ACQUIFER HIVE can be put next to the microscope as on-premise cloud to take care of that so that you don’t have to move your data but can view, process and store them via remote access.