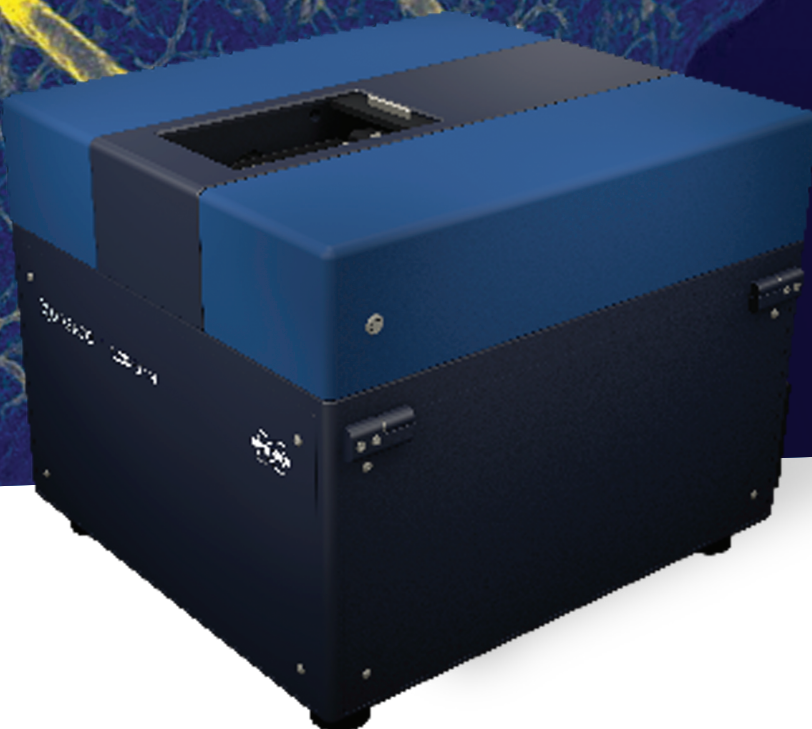
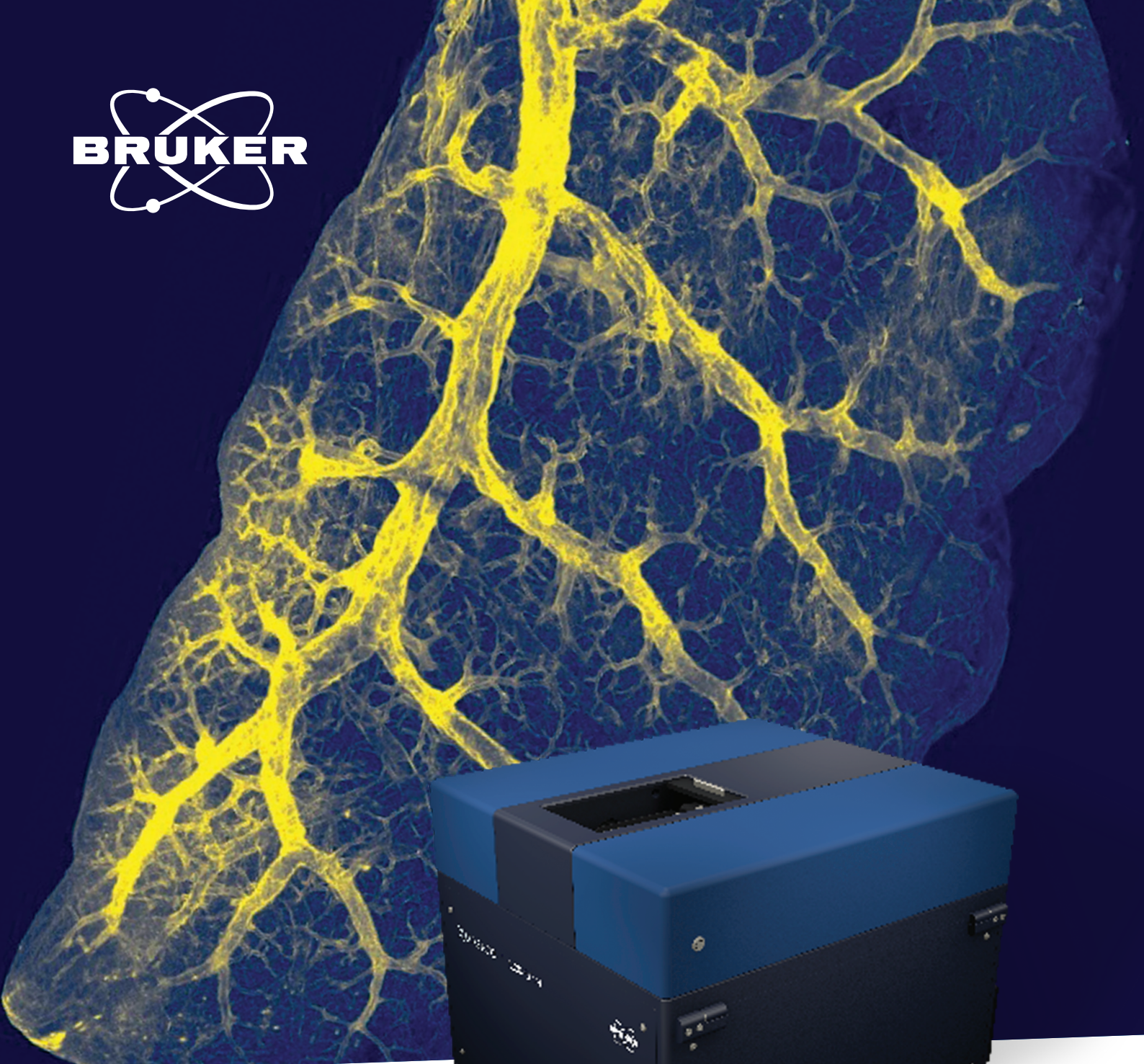
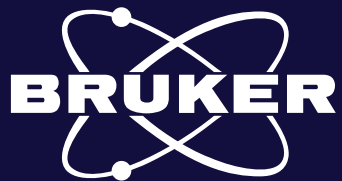




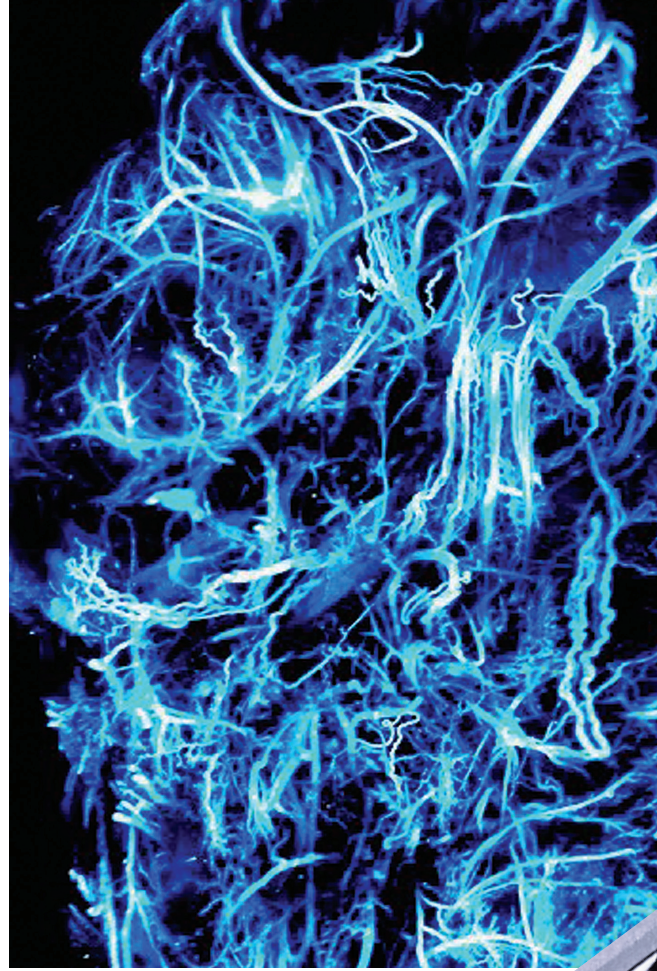
LIGHT-SHEET MICROSCOPY
LCS SPIM

The Large Cleared-Sample Light-Sheet Microscope

LCS SPIM

Proprietary Two-Sided Illumination, Single-Side Detection, and High-Throughput Imaging

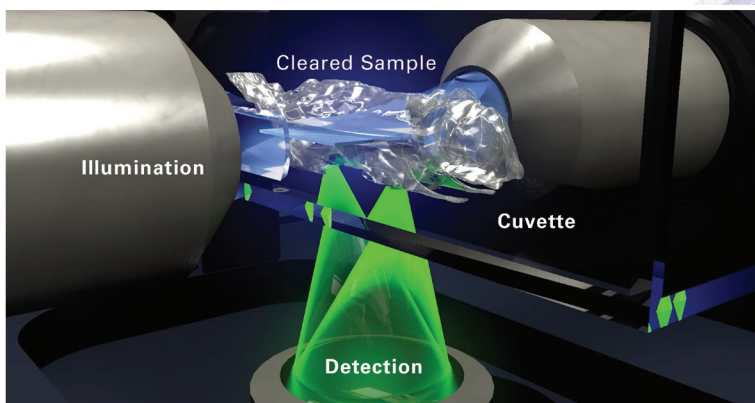
Bruker's LCS Selective-Plane Illumination Microscope (SPIM) is a compact light-sheet microscope specifically developed for very fast and gentle 3D imaging of large optically cleared samples. Designed in collaboration with life science researchers, the system incorporates flexible embedding options to support both small and large samples and is compatible with all currently available clearing solutions. A host of additional features make LCS an optimal system for multi-user environments and high-throughput experiments using different clearing approaches.



Sample imaged on the LCS SPIM courtesy of Dr. Chenchen Pan, DKFZ, Heidelberg, Germany.

The LCS SPIM uniquely provides:

- An inverted optical concept, three lenses, two-sided illumination, and single-side detection
- Low sample distortion acquisition and a fast-imaging option
- An extended field of view (FOV)



Rendering of sample cuvette in the LCS SPIM with a cleared mouse sample (blue shows illumination path, and green shows detection path).



Superior Flexibility for Advanced Experiments

Different tissues and samples often require separate clearing approaches and solutions. Whether it is cleared organs or whole organisms, from a brain to a whole mouse, the flexibility of the LCS SPIM allows imaging of all sample sizes. Samples are placed into exchangeable cuvettes, which makes sample handling safe and ensures compatibility with all clearing solutions. These quartz-crystal cuvettes range in size from 20x20x20 millimeters up to 100x30x30 millimeters and cover a refractive index range from 1.33 to 1.58.

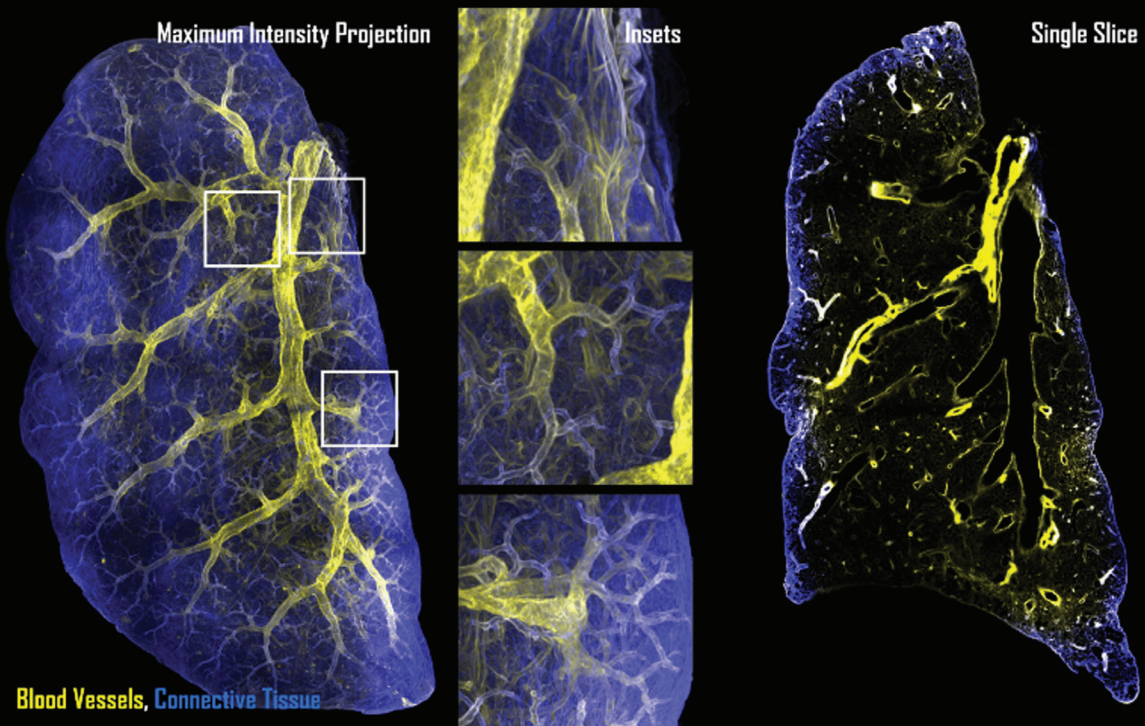


Easy-to-use sample holders were designed in collaboration with application specialists to allow for further customization during experiments.

Unmatched Light-Sheet Length Control with Fast Axial Scanning

The latest technology advances have enabled the development of ultra-fast varifocal lenses to fine-tune the system's optics. Luxendo SPIMs use devices that are driven by an acoustic wave, called *tuneable acoustic gradient lenses* or *TAG lenses*. These lenses allow better light-sheet control and uniformity across the FOV.

Light-sheet images of a lung. Samples courtesy of Ayelen Melina, Santamans Recchini, and Gaudalpe Sabio Buzo, Stress Kinases in Diabetes, Cancer and Cardiovascular Disease Laboratory and Unit of Microscopy and Dynamic Imaging, Centro Nacional de Investigaciones Cardiovasculares Carlos III (CNIC), Madrid, Spain.

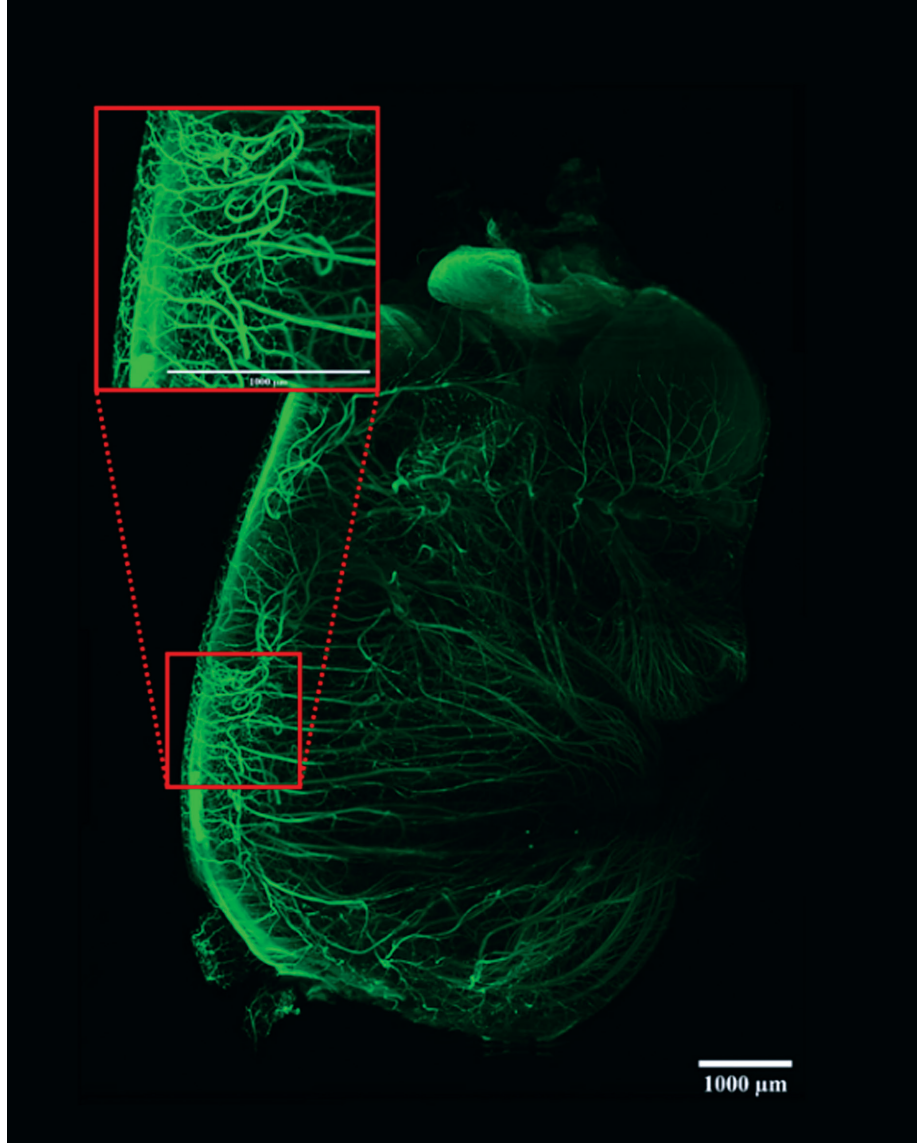


Perfected Illumination and Detection

To ensure the best image quality, all optical components are motorized so that every region of even the largest sample is optimally illuminated and imaged by the camera. The robust sCMOS cameras are well-suited for experiments that require high detection efficiency, quantification, and speed.

LCS image of developing nerves in a whole mouse embryo. Sample cleared with DBE. Tiled 3x4 image acquisition.

Sample courtesy of James Muller, MSKCC, New York, USA.



LCS SPIM Specifications

Detection	Effective Magnification	FOV	Pixel Size	Optical Resolution
Olympus 4x 0.28 NA	2.2x	5990 μm	2925 nm	1.1 μm
	4.4x	2995 μm	1463 nm	
	6.7x	1997 μm	975 nm	
	8.9x	1497 μm	731 nm	

Bruker Fluorescence Microscopy

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