

LCS SPIM

CLEARED SAMPLE IMAGING

LCS SPIM – THE LIGHT-SHEET MICROSCOPE FOR LARGE CLEARED SAMPLES

Luxendo's **LCS SPIM** is a compact light-sheet microscope designed for very fast and very gentle 3D imaging of large optically cleared samples. Like the Luxendo MuVi SPIM CS, it combines the advantages of light-sheet fluorescence microscopy and of tissue clearing methods. Novel and unique solutions facilitate mounting and fast microscopy of much larger samples, rendering it a unique tool in its field.

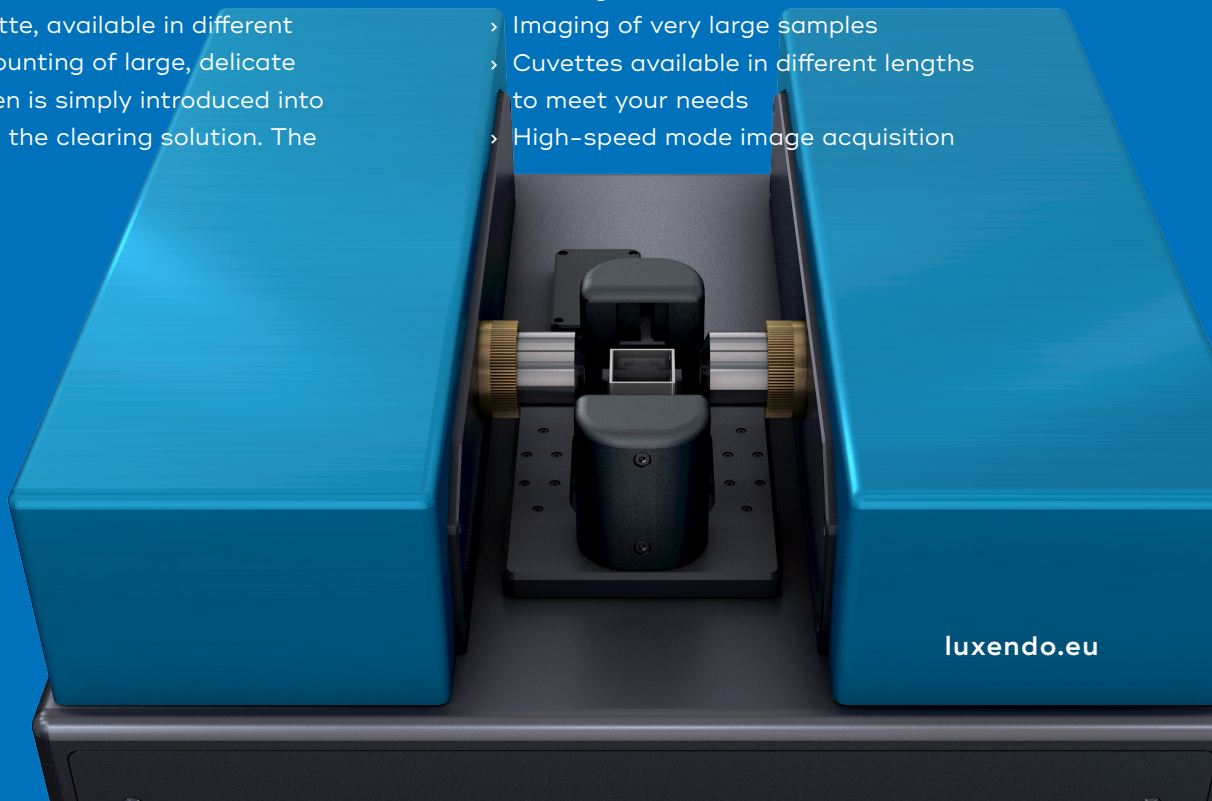
The basic configuration of the Luxendo **LCS** offers a cost-effective solution for cleared sample imaging. Based on a very versatile layout, the highly flexible upgrade options expand the performance of the system to increase speed and optical performance.

A quartz crystal cuvette, available in different lengths, facilitates mounting of large, delicate samples. The specimen is simply introduced into the cuvette filled with the clearing solution. The

motorized sample stage for positioning and stack acquisition and the programmable optics concept for fast 3D scanning of the light-sheet through the sample ensure that the sample remains unperturbed during the imaging experiment while achieving the highest acquisition speed.

The **LCS SPIM** is optimized for 3D imaging of large tissue structures, crucial when studying nervous system networks, when analyzing organ development or when investigating tumor structure and tumorigenesis in oncology. It enables

- › Imaging of optically cleared tissues, e.g. whole mouse brains, organs
- › Compatibility with a broad variety of clearing solutions
- › Imaging of very large samples
- › Cuvettes available in different lengths to meet your needs
- › High-speed mode image acquisition

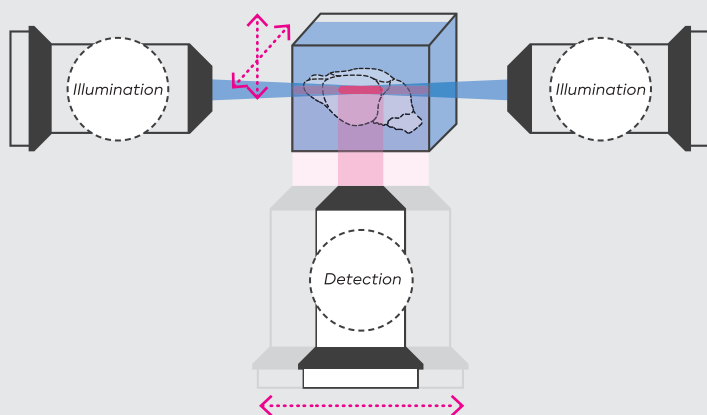


LCS SPIM

SPECIFICATIONS

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OPTICAL CONCEPT

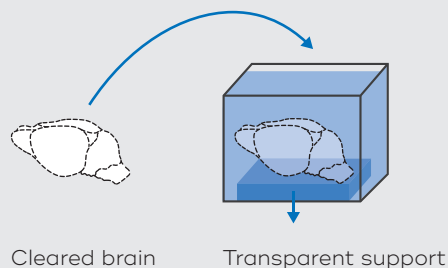


Two aligned light-sheets, shedding light from opposing directions on the sample

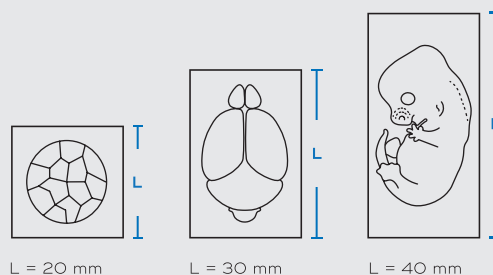
- › Minimized sample movement
- › Unprecedented imaging speed
- › Illumination objectives: Two Nikon 4x 0.2 NA air objective lenses
- › Detection objective: One Olympus 4x 0.28 NA air/dry objective lens
- › Upgradability to the Fast Imaging Mode

SAMPLE CHAMBER

A) Sample mounting

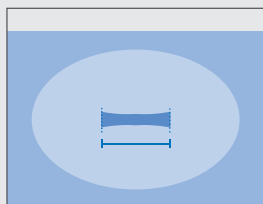


B) Exchangeable chamber in various sizes



FAST IMAGING MODE

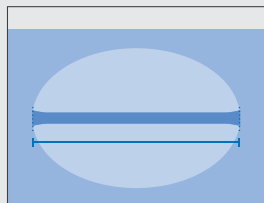
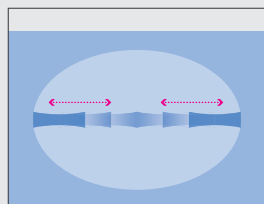
A) Basic configuration



— = FOV

- › Axial scanning for an extended FOV
- › Reduction of shadowing effects

B) Fast imaging configuration



— = FOV

- › Removable quartz crystal cuvette
- › Compatibility to a broad range of clearing solutions
- › Easy sample mounting
- › Different cuvette sizes:
 - Length: 20 to 40 mm
 - Height: 20 mm
 - Width: 20 mm
- › Refractive index range: 1.33–1.57
- › Ease of cleaning and maintenance

TruLive3D Imager

PURE LIVE IMAGING

TRULIVE3D Imager – THE INVERTED DUAL-SIDED ILLUMINATION LIGHT-SHEET MICROSCOPE

The Luxendo **TruLive3D** Imager is optimized for fast 3D multi-sample imaging of delicate live specimens in their native 3D environment. The optical concept, with dual-sided illumination and single-lens detection from below, enables fast acquisition speed, high-resolution imaging and minimal shadowing effects.

The extended sample holder (L=75 mm) is designed for multi-position imaging of small embryos (e.g. zebrafish, Drosophila or mouse), 3D spheroids, oocytes and more. The new **TruLive3D Dish** series of disposable sample holders seamlessly integrate into the system and allow testing different media conditions in one experiment.

The system ensures easy sample mounting and handling, robust data acquisition pipeline and scaling of experiments in a variety of applications including:

- › Time-lapse *in toto* imaging of small embryos
- › Imaging of 3D cell culture models (e.g. spheroids, organoids)
- › Tracking stem cell development and differentiation
- › In vitro fertilization research and monitoring

The optical concept and performance of the **TruLive3D** Imager enables

- › Minimized shadowing effects
- › 3D reconstruction
- › 5D/6D analysis
- › Tracking of cellular and subcellular events
- › Morphological analysis

Join us on our journey to a fascinating world of new applications – come and explore it with us!



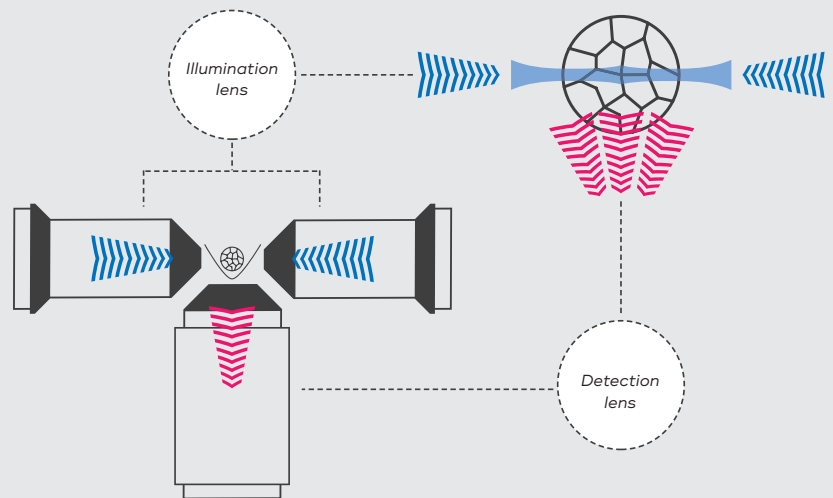
TruLive3D Imager

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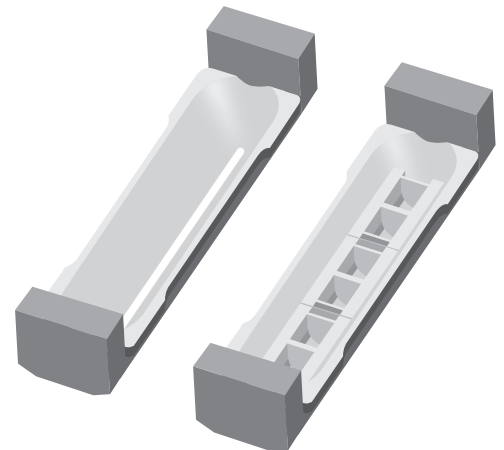
DUAL-SIDED ILLUMINATION

- › Inverted microscope configuration
- › Dual-sided illumination
 - › Fast imaging speed
 - › Large sample imaging
 - › De-shadowing
- › Wide-field imaging option for sample positioning
- › **Illumination objective:**
Nikon CFI Plan Fluor 10x W @ 0.3 NA,
 water immersion
- › **Detection objective:**
Nikon CFI Apo 25x W @ 1.1 NA,
 water immersion



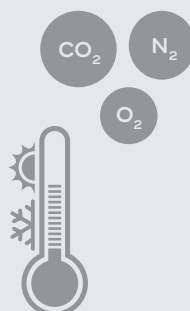
LARGE SAMPLE HOLDER

- › Length: 75 mm
- › For multiple-sample, high-throughput imaging
- › Accommodates up to three disposable **TruLive3D** Dishes
 - › Test several media conditions in one experiment



CONTROLLED

- › Small sample medium volume (separated from immersion medium)
- › Accurate temperature and atmosphere control
- › Easy sample accessibility



FLEXIBLE

- › Customizable laser combiner, up to 6 positions:
 405 / 445 / 488 / 515 / 561 / 594 / 642 /
 685 nm @ 50 mW
- › Flexible spectral configurations in two simultaneous channels
- › Fast filter wheels with 10 positions each
- › Easily exchangeable sample holder – customizable, disposable and biocompatible

