

LIGHT-SHEET MICROSCOPY

TruLive3D Imager

The inverted dual-sided illumination light-sheet microscope

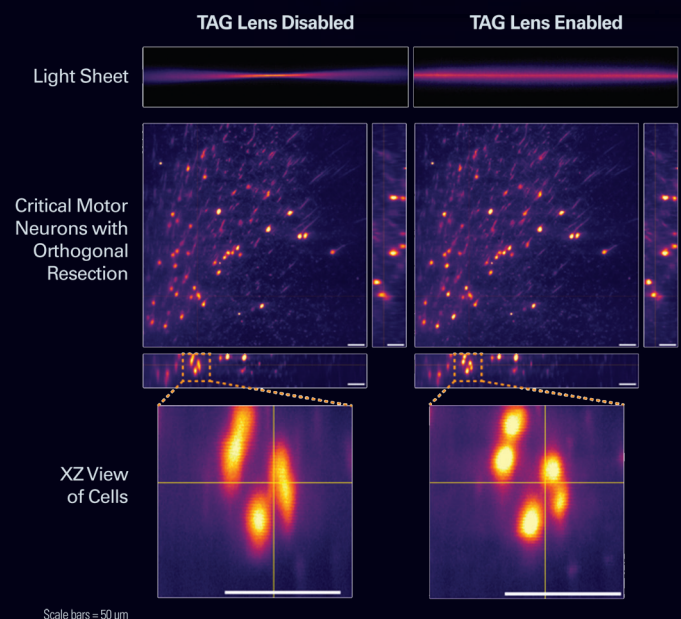
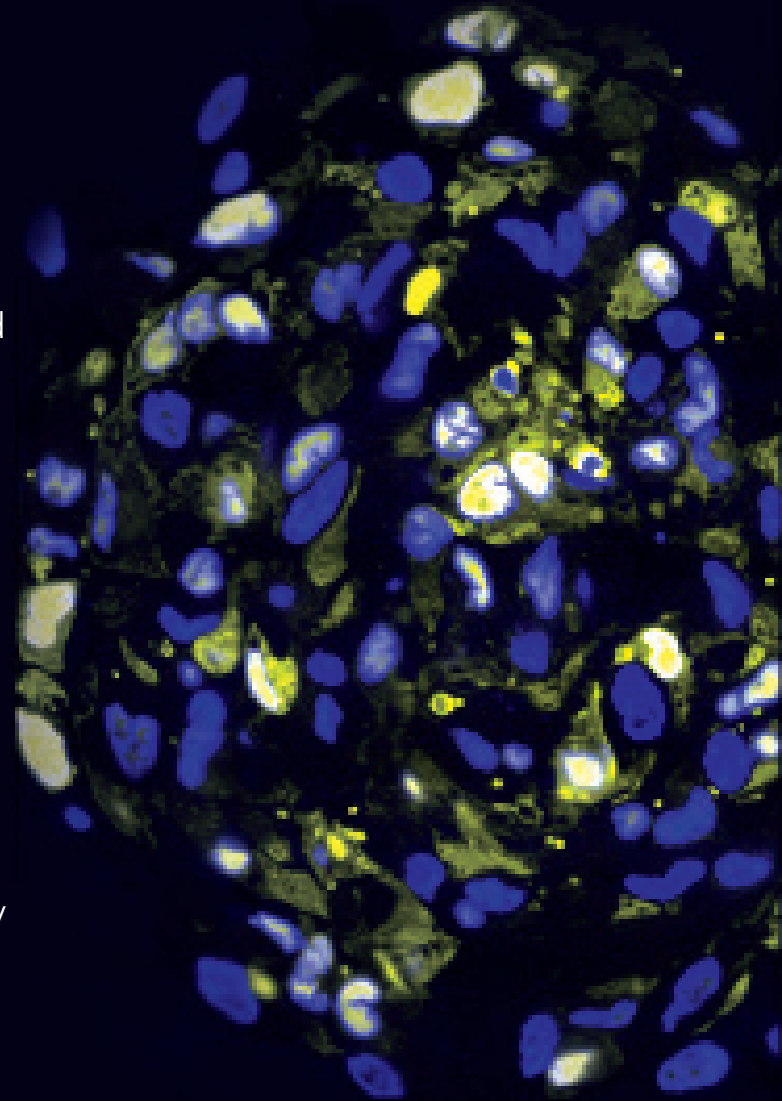
TruLive3D Imager

Delivering high-throughput imaging with outstanding environmental controls

Bruker's TruLive3D Imager is optimized for fast 3D multi-sample volume imaging of delicate live specimens in their native 3D environments. Using an optical concept with dual-sided illumination and single-lens detection from below (inverted microscope geometry) enables fast acquisition speed, high-resolution imaging, and minimal shadowing effects. The system's latest technology advances and options, such as the addition of a photomanipulation module, make it ideal for time-lapse and high-throughput imaging of 3D spheroids, organoids, 3D cell cultures, and small embryos.

Only TrueLive3D Imager provides:

- Outstanding long-term environmental control for live cells of sensitive samples
- Multiplexing with an elongated sample holder for hundreds of samples
- Time and money saving with up to six different experimental conditions in one experiment
- User-friendly mounting with ready-to-go and sterile dishes



TAG lens disabled generates non-uniform resolution (left). TAG Lens enabled generates a homogeneous illumination profile.

Dual-Sided Technology for High-Throughput Discovery

The TruLive3D Imager is a stable and compact light-sheet solution that features dual-sided illumination and single-lens detection from below. Therefore, enabling fast acquisition speed, high-resolution imaging, and minimal shadowing effects. The system can achieve a resolution down to 255 nm in xy, enabling resolving subcellular structures in living samples with minimal phototoxic effects.

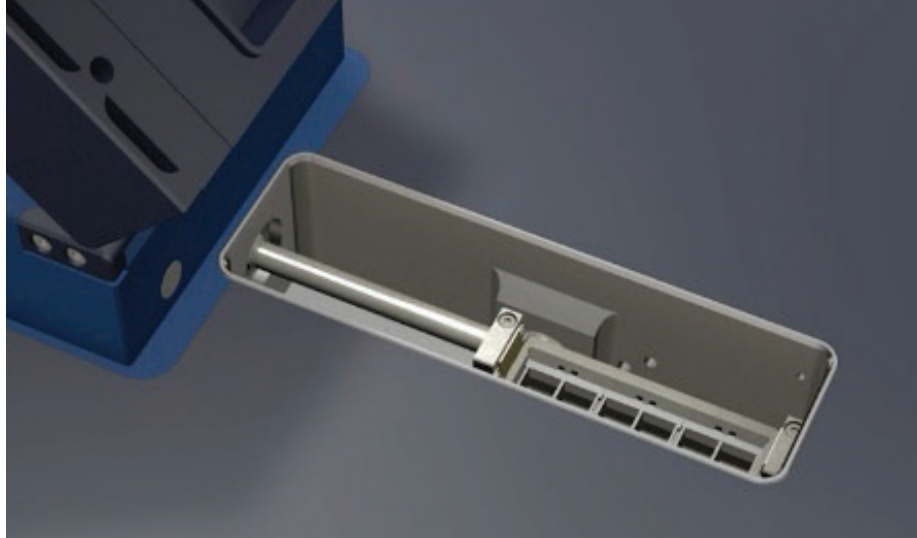
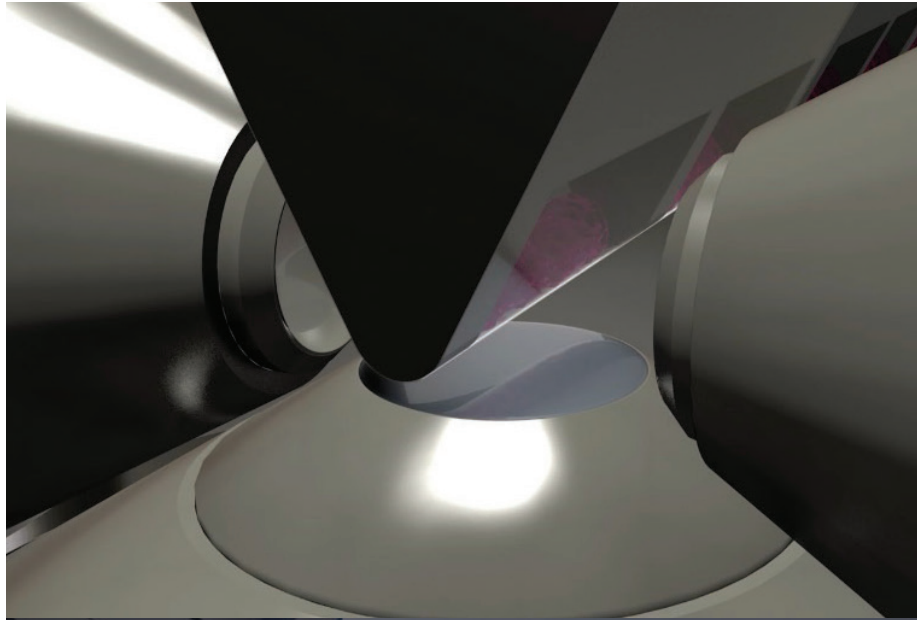
TruLive3D Imager fits on a lab bench without the need for an air table and its piezo-crawler stages provide precision and longevity for accurate and fast specimen positioning. Using pseudo-brightfield, samples can be easily located and have their health monitored. The system is also optimized for fast long-term in vivo imaging with advanced environmental control for experiments such as spheroid and organoid cell-divisions and 3D cell culture growth. Furthermore, a large sample holder (75 mm; travel range 66 mm) and TruLive3D Dish series allow for long-term imaging under a variety of experimental conditions.

State-of-the-art technologies with ultra-fast varifocal lenses make the optical system fine-tuned. For adaptive optics, the TruLive 3D Imager uses devices driven by an acoustic wave, called tuneable acoustic gradient lenses (or TAG lenses) that allow better light-sheet control and uniformity while reducing axial stretching.

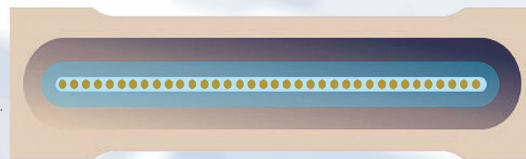
Unique TrueLive3D Imager features include:

- High-quantum efficiencies of up to 82% provide excellent image quality
- Simultaneous dual-channel acquisition for high imaging speed
- Stage travel ranges of 66 x 3 x 3 mm for precise sample positioning
- Dual-destriping eliminates strip artifacts

TruLive3D Imager has a large sample holder that is 75mm long with two sample spaces and three disposable dishes.



Sample Chamber



With Insets

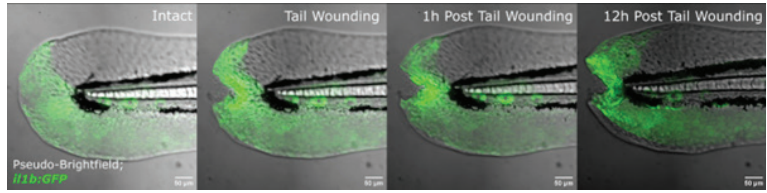


Length 75 mm

Optional Photomanipulation Module

A photomanipulation (PM) module can be added to TruLive3D Imager, allowing for experiments such as photoablation, cauterization, optogenetics, and fluorescence recovery after photobleaching (FRAP) with:

- Beam coupled into detection objective
- Diffraction-limited illumination spot
- Flexible region-of-interest (ROI) generation (point, straight line, freeform, circle and square)
- Laser from continuous wave ultraviolet/visible (CW UV/VIS) to pulsed infrared (IR)



Timelapse of cytokine dynamics in a tail wound assay. Pseudo-Brightfield and il1b:GFP (green) merged. Captured every 5 minutes for 12 hours. Sample courtesy of: Dr. Elizabeth Jerison, Stanford University.

TrueLive3D Imager Objective Specifications

Objective	Tube lens	Magnification	Pixel Size [nm]	FOV [μm]
Nikon CFI APO LWD 25x 1.1 NA	100	12.5x	520	1065
	200	25x	260	532
	300	37.5x	173	355
	400	50x	130	266
Olympus XLUMPLFLN 16x 0.8 NA	100	8x	813	1664
	200	16x	406	832
	300	24x	271	555
	400	32x	203	416

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