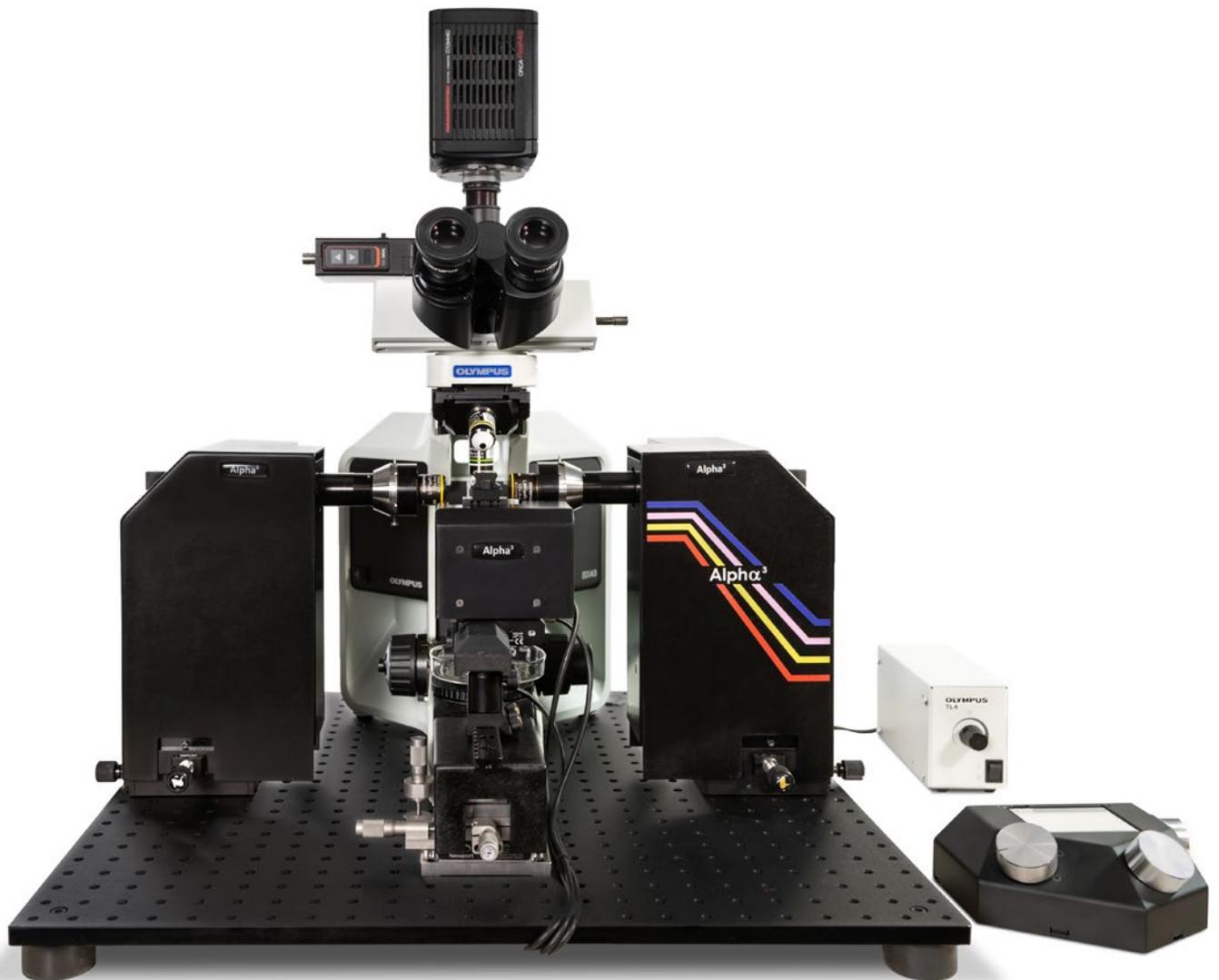


Flexibility Meets Quality Performance

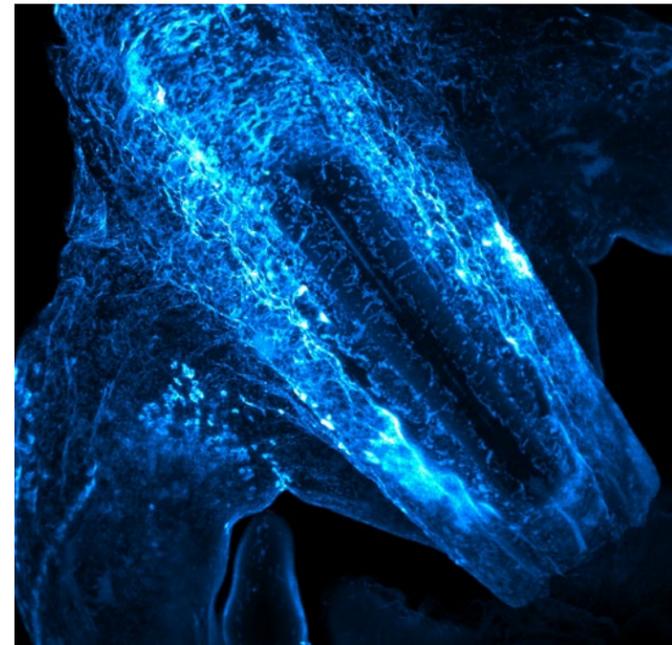


High-Resolution 3D Images with Low Phototoxicity

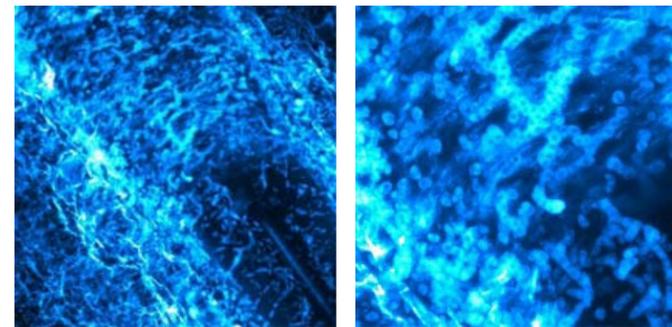
The Alpha³ light sheet microscope system from PhaseView[®] combines speed and high-quality Olympus optics for high-resolution 3D imaging of both live and fixed biological samples. The Alpha³ enables volume acquisitions at up to 75 images/second with the Smart 3D Scanning module, delivering high spatial and temporal resolution while minimizing phototoxicity. The system's dual illumination configuration combined with real-time laser focus sweeping technology permits very thin optical sectioning with illumination homogeneity, increased axial resolution, and enhanced signal-to-noise response compared to traditional confocal techniques. The Alpha³ system can thus provide enhanced subcellular resolution without compromising speed or excitation efficiency.

Dual Illumination

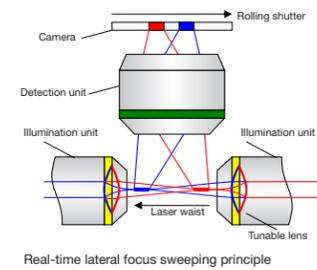
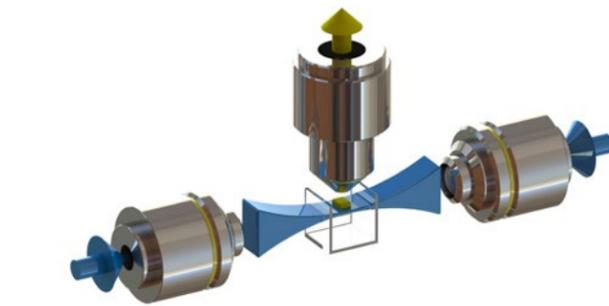
Through the integration of dual illumination units, the multi-directional light sheet provides artifact-free images of absorbing or scattering specimens. The optional Real-Time Optical Focus Sweeping module optimizes sharpness across the entire field of view, delivering excellent image quality.



Mouse embryo at 10x



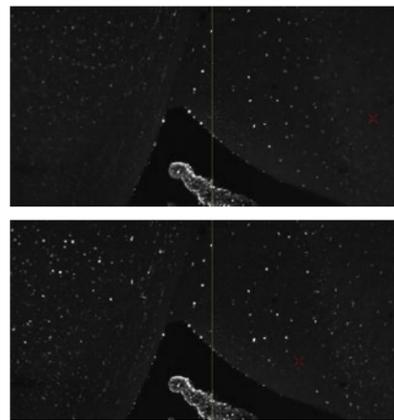
Real-Time Optical Focus Sweeping



Real-time lateral focus sweeping principle

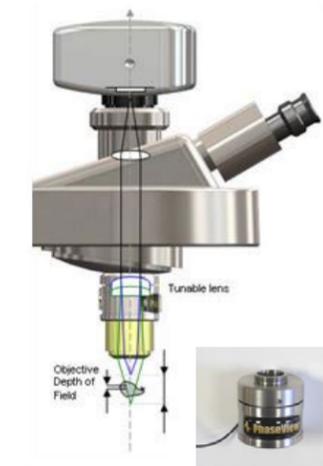
Optical focus sweeping alleviates spatial and temporal resolution constraints for 3D image acquisition. This optional module maintains the light sheet's focus across the entire field of view for clear images, as the exposed field is always in the light sheet's thinnest region.

The principle relies on a tunable lens for focal plane sweeping that is synchronized with the camera's rolling shutter.



Cleared mouse brain image taken without (top) and with optical focus sweeping (bottom).

Smart 3D Scanning



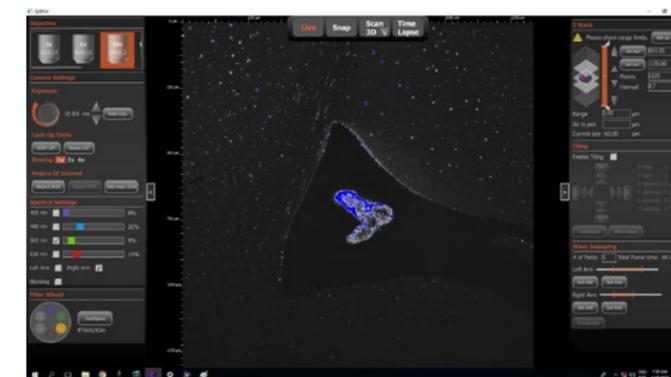
Instead of moving the sample to perform Z-plane scanning, the specimen is set in a fixed position while the illumination and the detection planes simultaneously move through the sample. The sample remains in a steady position, minimizing vibrations and perturbation issues. The illumination plane is scanned using a galvanometric mirror, while the detection plane is scanned using a remote focusing device to provide high-speed, perturbation-free 3D imaging at 75 images/second.

QtSPIM Acquisition Software

The QtSPIM software provides a clear and intuitive interface for collecting X, Y, Z, θ , T, λ images with an efficient workflow. Raw image data, along with their metadata, are saved in 16-bit TIFF format for compatibility with open source or commercial software for further 3D display and analysis.

QtSPIM controls all image acquisition parameters including:

- Laser settings
- Camera controls
- Focus control
- Z-stacking
- Multichannel and time-lapse acquisitions



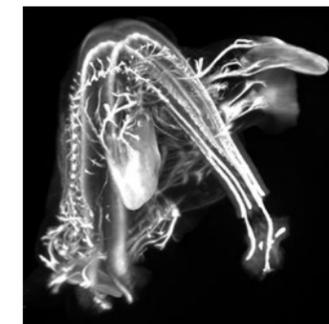
QtSPIM user interface for 3D imaging

Flexible and Affordable

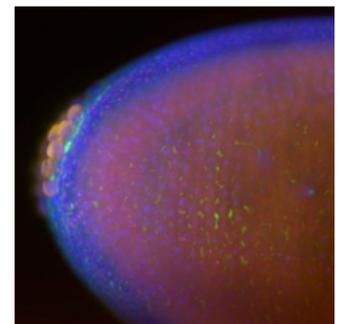


From *in vivo* imaging to large cleared samples, the Alpha³ microscope delivers high-quality images while maintaining the flexibility and modularity you expect in an advanced scientific research instrument.

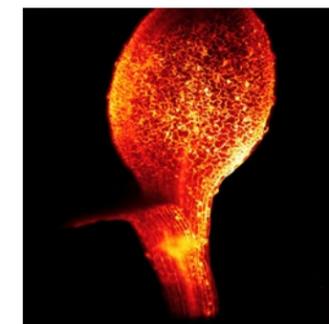
- A variety of sample holders accommodate a broad range of sample sizes.
- Live observation using optical eyepieces and an environmentally controlled yet easily accessible sample chamber.
- Macro-to-micro viewing for imaging whole organs as well as very small organisms at a subcellular resolution.
- Corrosion-resistant mounting accessories for aqueous and organic solvents.
- Compatible with a full selection of quality, trusted Olympus objectives (2X–60X).



Maximum intensity projection of mouse embryo



Fixed drosophila egg, 3 channels at 20x



Membrane stained Arabidopsis leaf at 10x

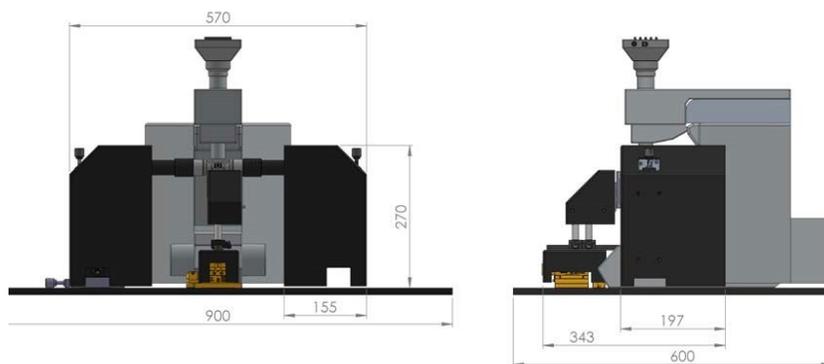


Fixed Stentor, GFP cilia and DAPI polynuclei at 10x

Alpha³ Specifications

	Included	Optional
Light Source	Laser combiner with up to 4 laser lines: fibered lasers CW / laser diodes or DPSS; wavelength selection from 405 nm to 785 nm; output power from 25 to 250 mW	Laser combiner with 2 or up to 6 laser lines
Illumination Unit	Dual smart illuminators with a fibered connection to laser combiner; multidirectional light sheet with real-time focus sweeping; chromatic correction: 400 nm–632 nm; minimum light sheet thickness 2 µm, range: 2 µm–12 µm, width: 2 mm–15 mm	
Illumination Objectives	MPLFLN 2.5X 0.08 air	
Chamber and Sample Holders	Chamber dimensions (W × L × H): 21 mm × 70 mm × 25 mm (0.83 in. × 2.8 in. × 1 in.); volume < 15 ml; chamber highly resistant to various corrosive media, clearing agents, sea water, etc.; sample size from µm to cm range; multiple holders for sample mounting: molds, coverslips, glass supports	Small chamber dimensions (W × L × H): 14 mm × 13.8 mm × 11.5 mm (0.6 in. × 0.5 in. × 0.4 in.); temperature and CO ₂ controls
Volume Scanning	Motorized Z-stage: range 15 mm, precision 0.1 µm, acquisition speed 40 fps	Smart 3D scanning module for ultra-fast 3D acquisition (75 images/second)
XY Tiling		Motorized XY-stages for tiling: range 15 mm, precision 0.1 µm
Detection Unit	BX43 fluorescence microscope stand with 2-position objective slider, eyepieces, video port, motorized filter wheel, and multinotch filter	
Detection Objectives	Large selection of long working distance objectives: air, dipping lenses, clearing objectives with correction collar for RI 1.33–1.56; magnification from 2x to 40x	
Image Sensor	sCMOS: 2048 × 2048 pixels; format: 13 mm × 13 mm; size: 6.5 µm × 6.5 µm, USB 3.0/CameraLink interface	
Software	QtSPIM software for Z-stacking, XY tiling, and time-lapse acquisition, providing easy export of raw images and metadata to open source or commercial 3rd party software	Arivis® software package for 3D visualization and image processing
PC Configuration	Desktop i7-7700K 4.2 GHz; 2 × 16 GB RAM; GPU GeForce® GTX1060-6GB; Hard Disk 4 × 4T B RAID0; Hard Disk SSD 500 GB; QHD Screen 31.5 in., Windows® 10/64-bit Professional	
Dimensions (W × L × H) and Weight	Microscope breadboard format 600 mm × 600 mm × 750 mm (23.6 in. × 23.6 in. × 29.5 in.); 27 kg (59.5 lbs)	

Dimensions



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