

DALISPIM

Automatable light sheet
imaging has arrived.



Illuminating life like never before.

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Learn more about LifeCanvas and how to get in touch.



Overview

DALISPIM is an open-top light sheet microscope that redefines high-throughput spatial biology.



Ready for automation

Compatible with standard sample holders like well plates, slide glasses, and Petri dishes – no immersion bath required.



Unmatched versatility

Image live or cleared tissues up to 6–8 mm thick including intact organs, organoids, sections, and even entire organisms.



Intuitive and user friendly

Easy imaging setup and acquisition software with step-by-step guides for alignment, tiling, and more.



High speed, high resolution

Patented axial sweeping technology generates high-quality 3D data without compromising acquisition speed.



End-to-end solutions

Comprehensive post-processing package seamlessly takes you from raw data to complete volumetric datasets.



Optimized data storage

Leverage MOSAIC to store and access your light sheet data in a purpose-built, high-performance storage solution.

Technology

What is light sheet microscopy?

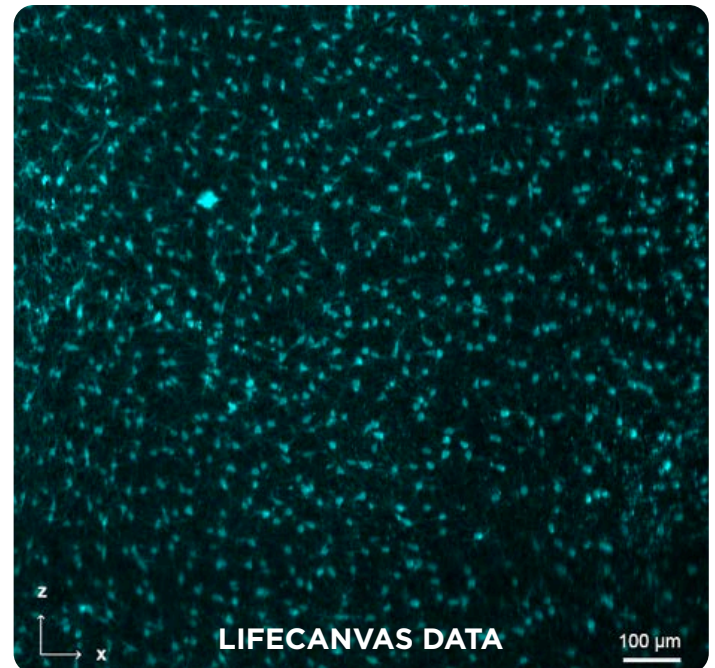
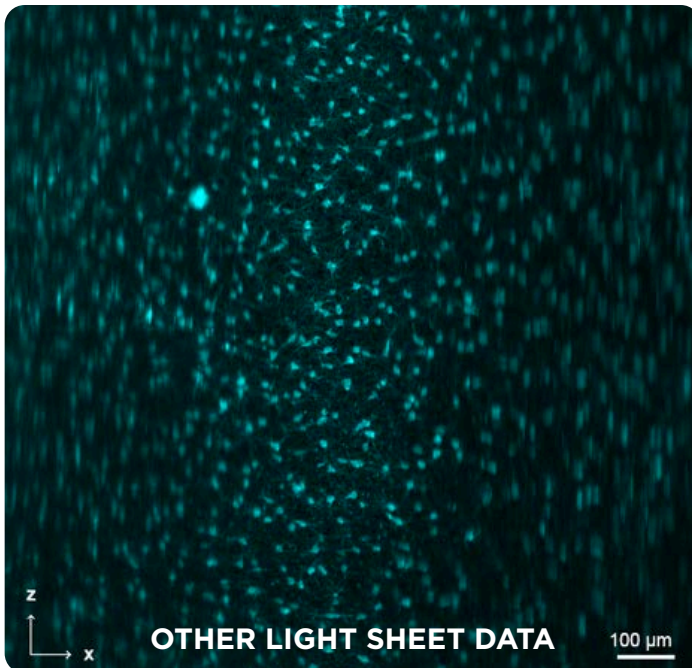
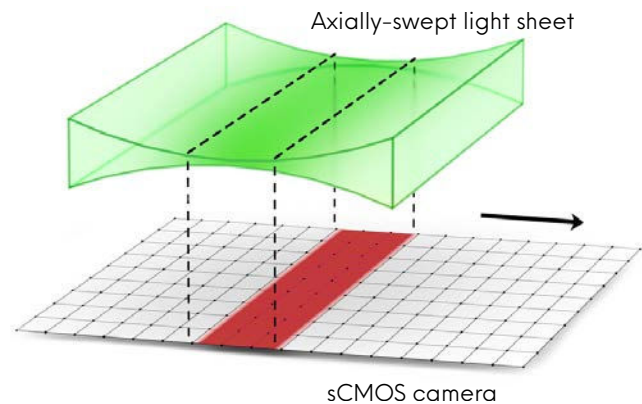
Light sheet fluorescence microscopes “optically section” whole samples by effectively decoupling the paths of illumination and detection into separate light paths, illuminating one z-plane of the sample at a time. This results in volumetric imaging data with minimal photobleaching and low-to-zero background from other z-planes.

DALISPIM uses patented **axial sweeping technology**² to speed up imaging time while obtaining high-resolution data across the field of view.

²Fiolka & Dean US10989661B2

How does axial sweeping work?

Illumination optics scan the beam while synchronized to the rolling shutter of an sCMOS camera, which captures only the narrowest part of the light sheet. This maintains high resolution across the field of view (FOV) while omitting out-of-focus regions, enabling rapid image acquisition with uniformly high resolution in all axes.



Axial sweeping results in high axial resolution across the entire FOV (right) as opposed to just the center (left).

Pictured above: **microglia** in a mouse brain model of Alzheimer's disease from Taconic Biosciences.

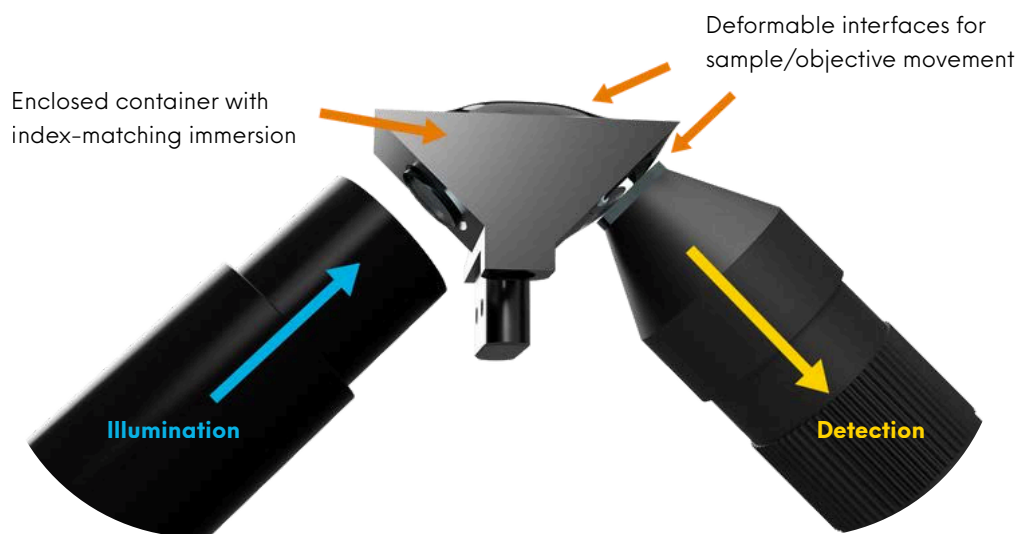
Bringing open-top flexibility to light sheet imaging

Dual-objective light sheet designs facilitate alignment and expand objective choices compared to single-objective setups. However, implementing them in an open-top configuration is challenging due to the angled sample surface.

DALI technology overcomes these challenges, allowing DALISPIM to **achieve optical coupling with standard sample holders – no immersion baths necessary.**

DALI: Depth Adaptive Light Interface

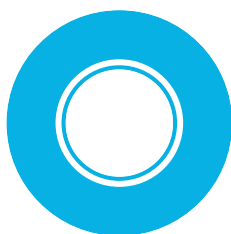
DALISPIM pairs an enclosed RI-matching immersion with a deformable interface to create an RI-matched light path throughout the z-depth range. This innovation, plus a dual-objective design, make the system uniquely compatible with different sample and carrier types.



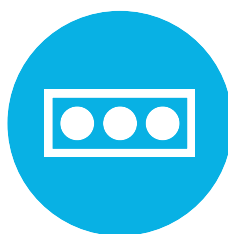
DALISPIM is compatible with **most standard sample holders**, including:



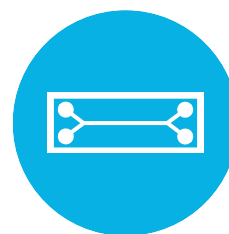
Multi-well plates



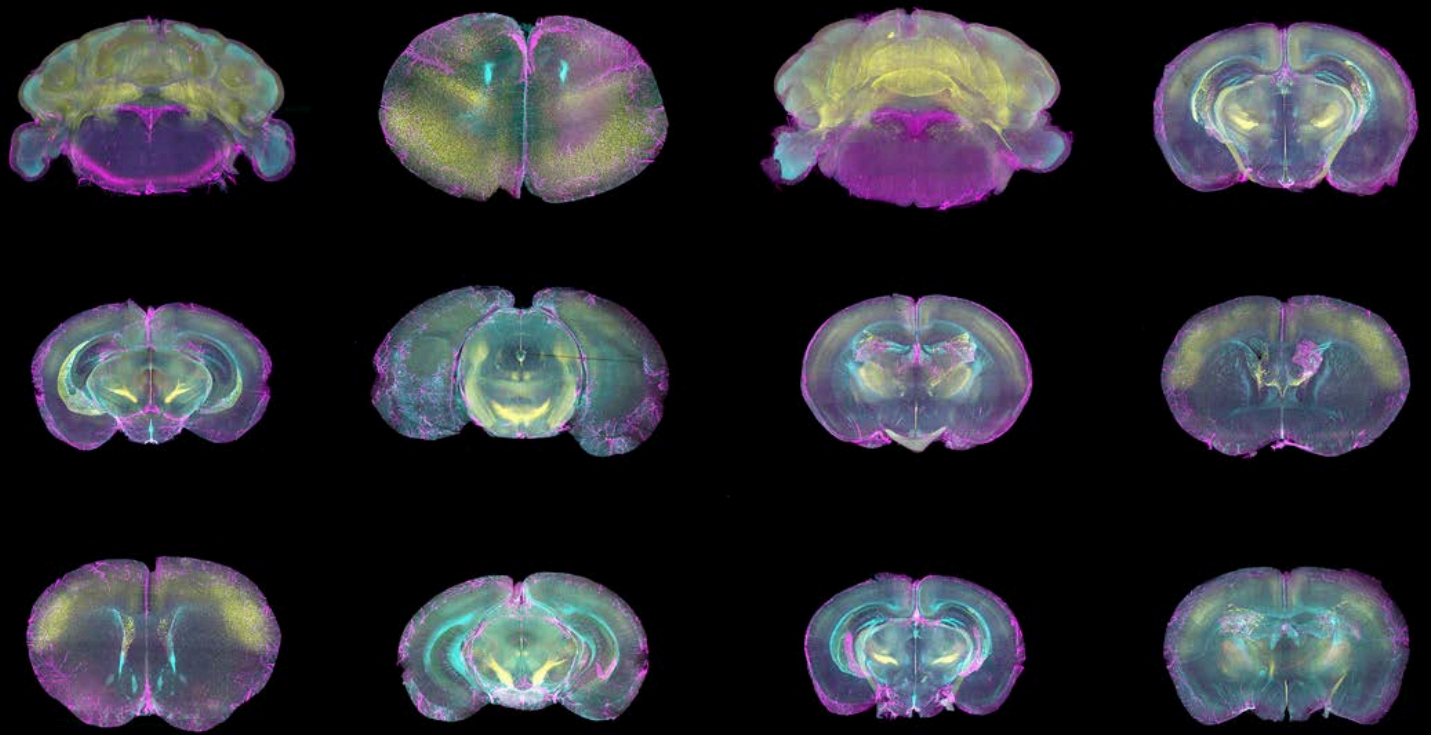
Petri dishes



Slide-mounted sections

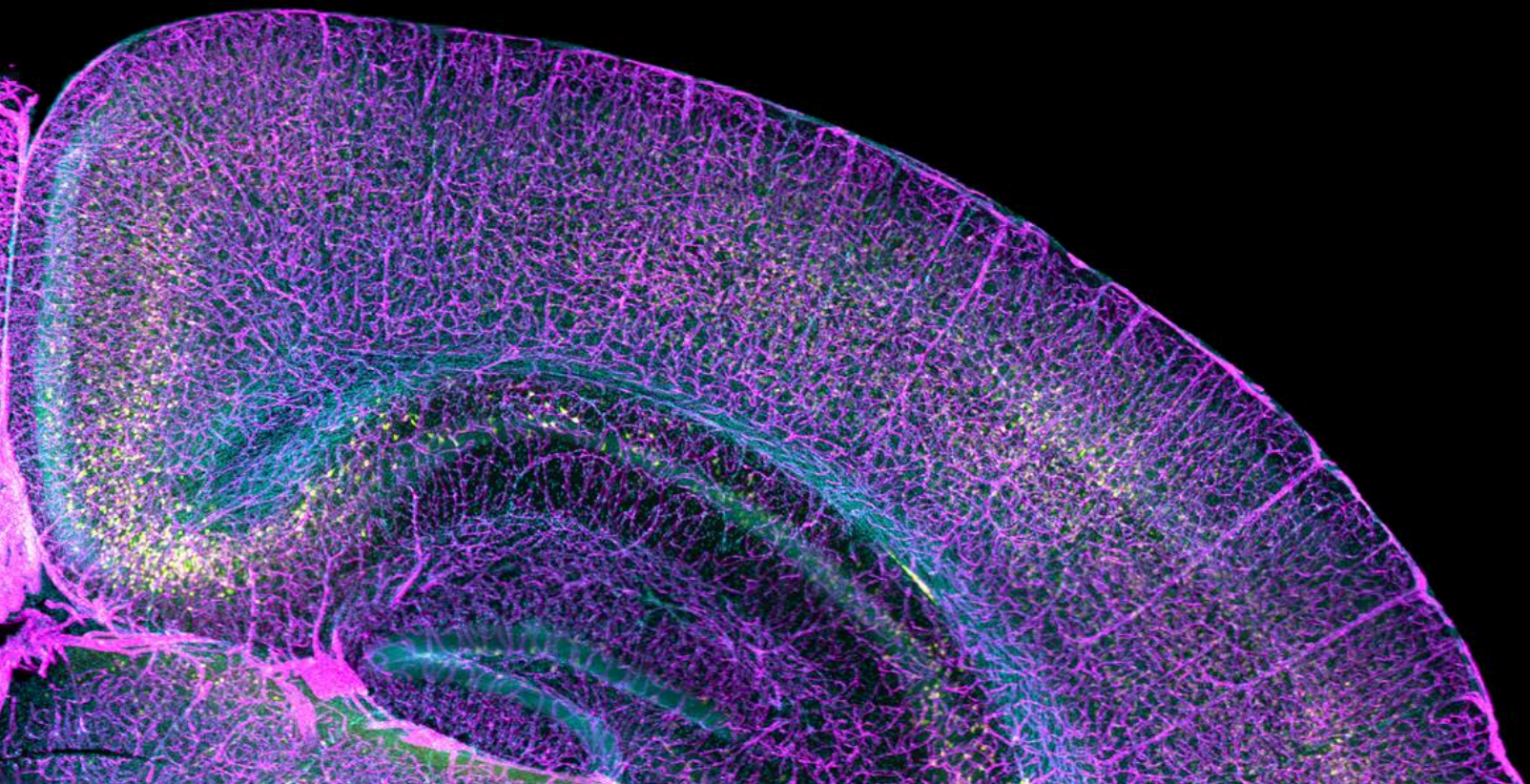


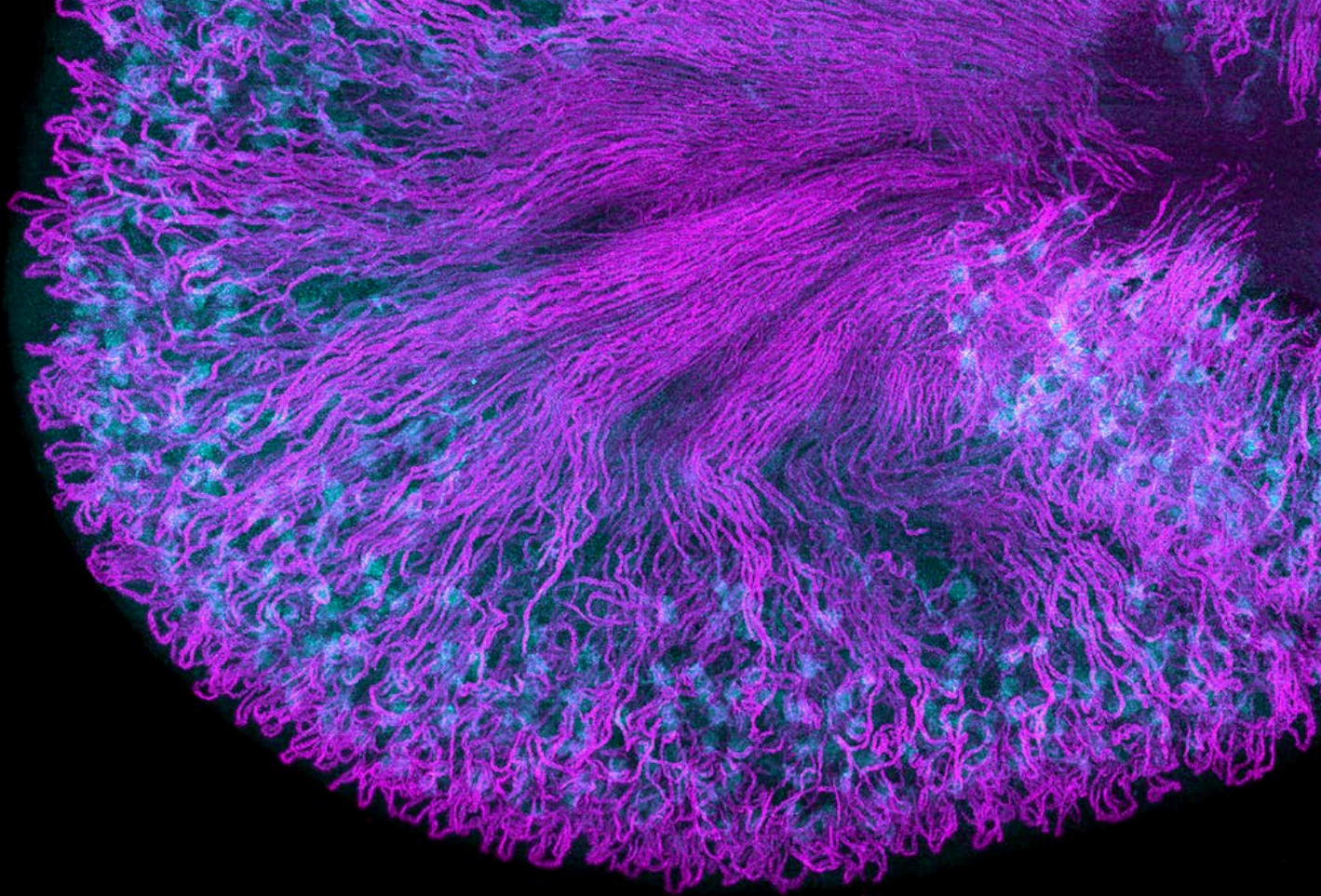
Organ-on-a-chip devices



12 mouse brain slices imaged in the same well plate

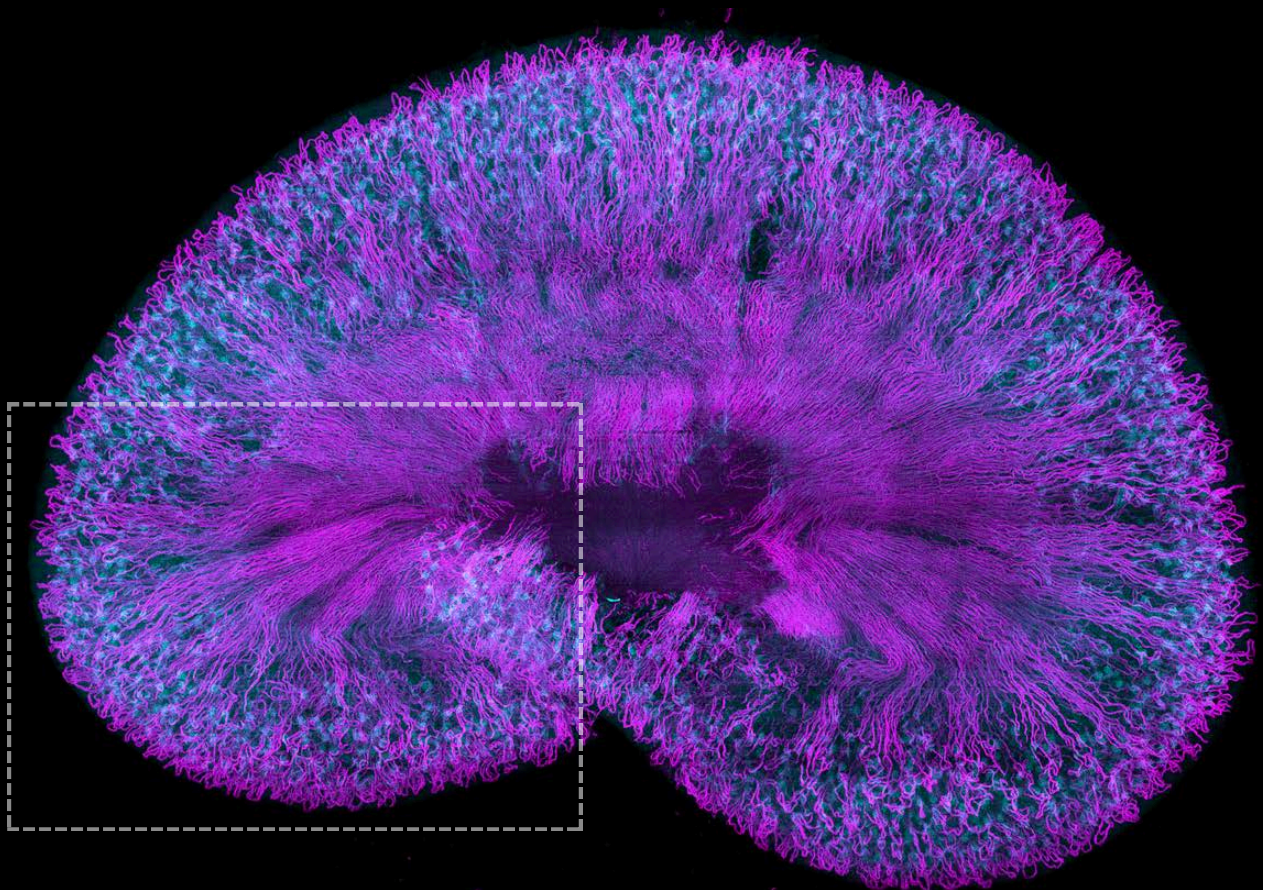
These 1-mm thick sections were imaged in one 12-well plate. DALISPIM eliminates the need to transfer samples to separate carriers, streamlining imaging workflows. Vasculature is labelled by CD31, **parvalbumin cells** are visualized by endogenous tdTomato, and nuclei are stained by DAPI.

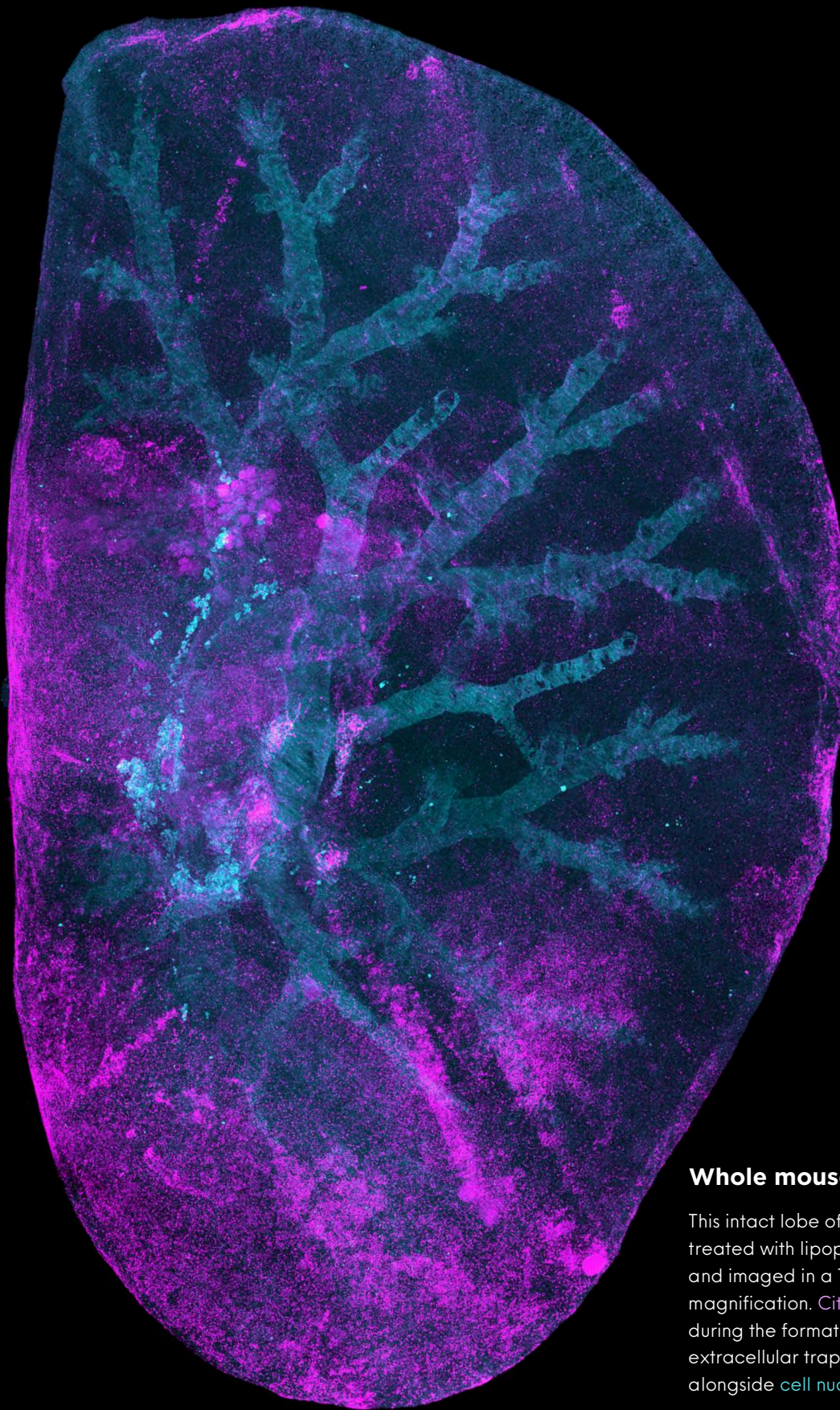




Mouse kidney section

This 1 mm-thick section of mouse kidney shows blood vessels stained with lectin and cell nuclei stained with propidium iodide. Sample was imaged in a 12-well plate at 3.6X magnification





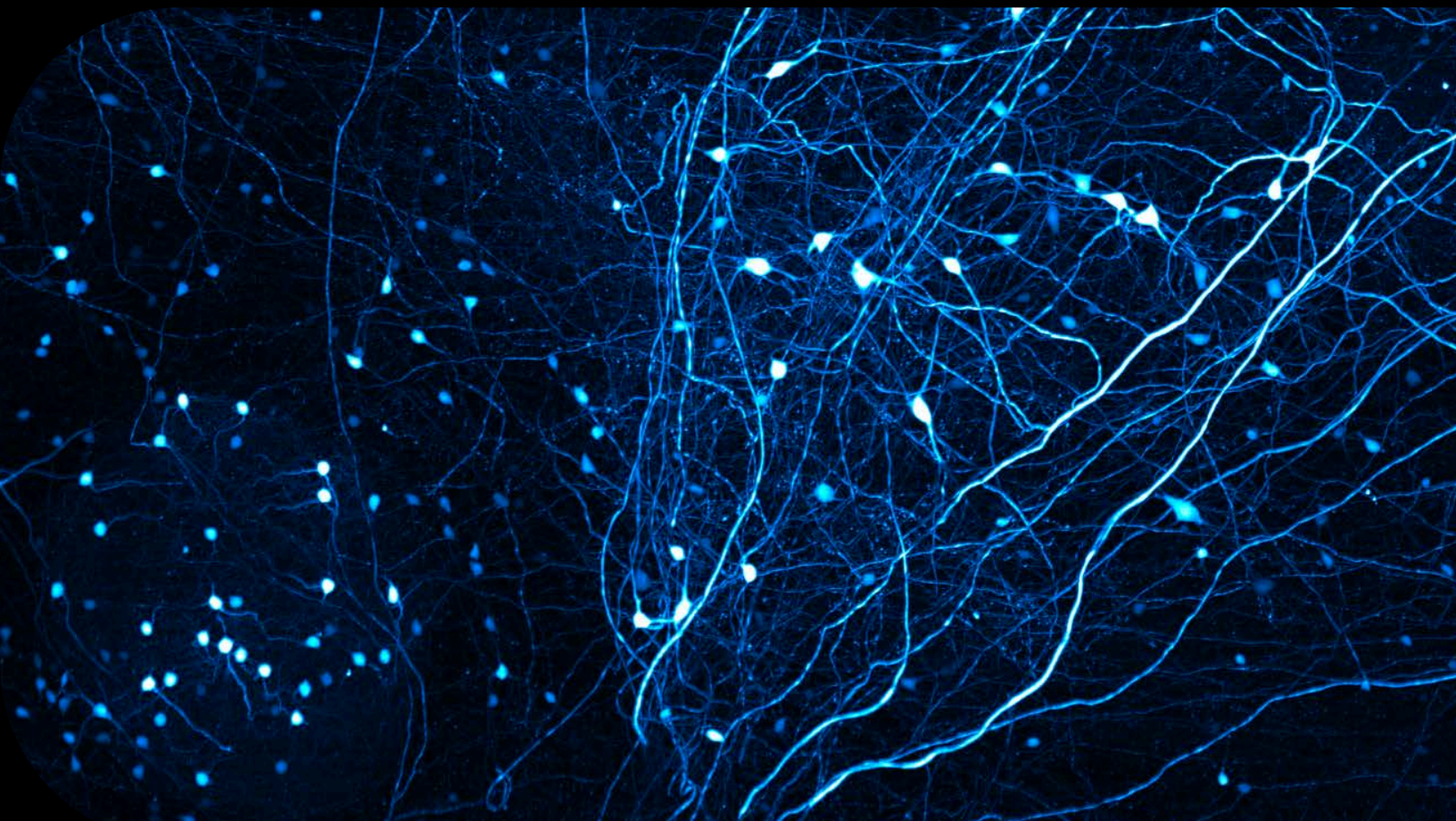
Whole mouse lung lobe

This intact lobe of a mouse lung was treated with lipopolysaccharide (LPS) and imaged in a 12-well plate at 3.6X magnification. Citrullinated-H3, released during the formation of neutrophil extracellular traps (NETs), is visible alongside cell nuclei.



Endogenous GFP in an intact mouse brain hemisphere

This intact mouse brain hemisphere was imaged in a 12-well plate at 9X magnification. Thyl gene expression drives endogenous GFP, visualized here in cyan.



Specifications



Microscope

- DALISPIM light sheet microscope
- Compatible with standard glass bottom well plates
- Custom sample holders available (up to 250 x 75 mm in lateral dimension)

Illumination

- Custom illumination objective, NA 0.125
- Axially-swept light sheet driven by electrical tunable lens
- Laser lines
 - Standard: 488 nm, 561 nm, 640 nm
 - Optional: 405 nm, 445 nm, 514 nm, 594 nm, 690 nm, 785 nm

Objectives

- Multi-immersion detection objectives (compatible with refractive index 1.33–1.56)
 - 1.8x, NA 0.1, 25-mm WD, 12-mm flat sample depth, 3.6 μm voxel size
 - 3.6x, NA 0.25, 20-mm WD, 8-mm flat sample depth, 1.8 μm voxel size
 - 9x, NA 0.3, 18-mm WD, 8-mm flat sample depth, 0.7 μm voxel size
 - 15x, NA 0.4, 12-mm WD, 5-mm flat sample depth, 0.4 μm voxel size

Camera

- Hamamatsu Orca Fusion sCMOS camera with light sheet mode
- Liquid cooling system

Software

- DALISPIM acquisition software
 - Automatic sequential imaging and array imaging
- Downstream post-processing software
 - Destriping, deskewing, and stitching

Ask us about MOSAIC data storage solutions

- High performance storage pool with all-flash NVMe storage
- High storage capacity up to 1.44 PB in compact desktop form-factor
- Fast networking speed with 100Gbe to the storage server, 25Gbe to clients



End-to-end solutions

Streamlining spatial biology, from sample to data

At LifeCanvas, we are pioneering innovative technologies for sample preparation, imaging, and analysis. Every step of our pipeline is optimized to generate the highest quality volumetric data for robust, accurate analyses and publication-quality outputs.



Sample preparation

Protect, clear, and label tissues with tools that preserve sample integrity and key biomolecular features.



Light sheet imaging

Capture high-quality 3D image data from a variety of sample types with unmatched speed and resolution.



Data storage & analysis

Make sense of complex volumetric data with streamlined storage, processing, and analysis solutions.

Explore 3D data

Visit our video gallery to browse datasets from a variety of tissues & species.



Ready to learn more?

Get in touch by visiting us online or emailing us at info@lifecanvastech.com.

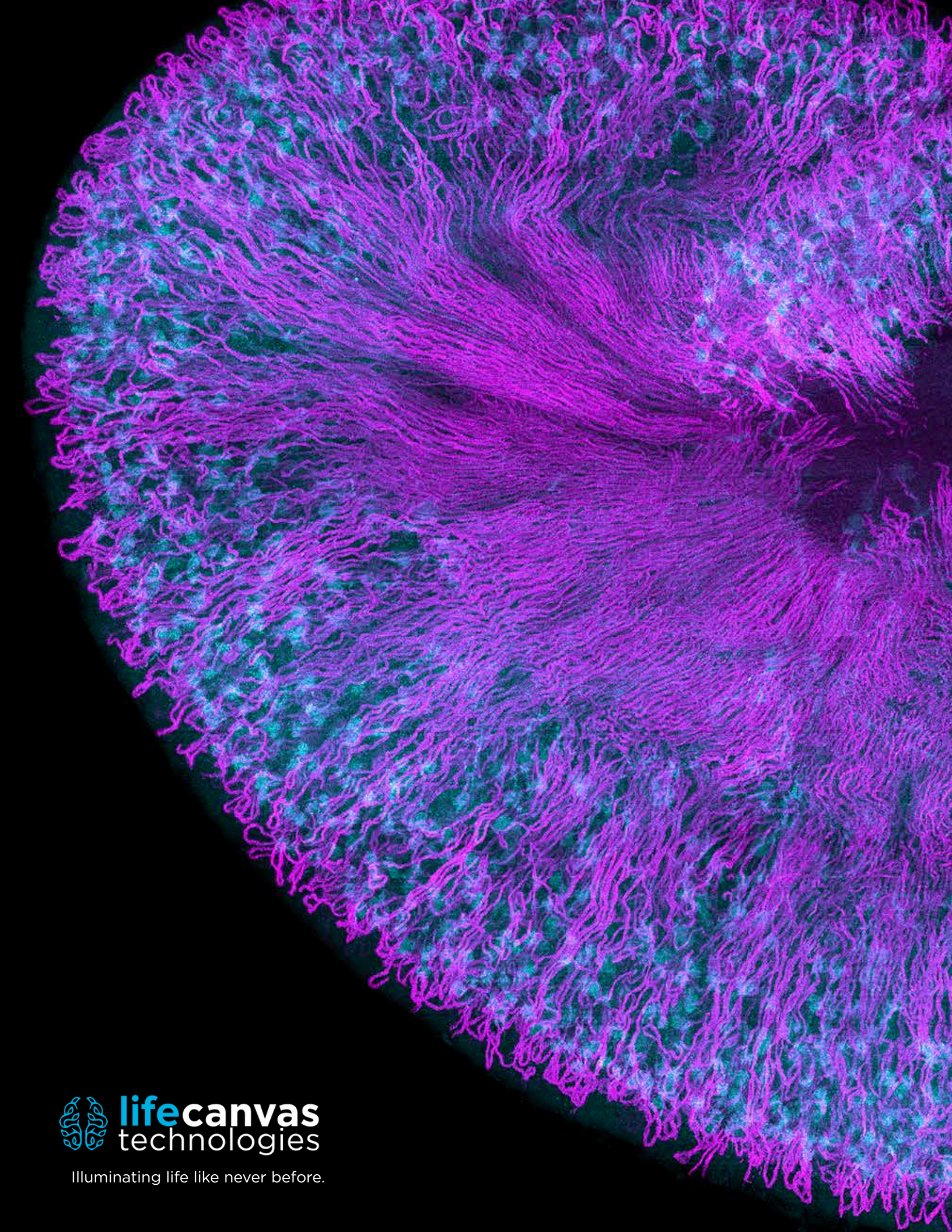


CRO services for 3D molecular mapping

Experience our full pipeline, tailored to your application, by trying out our CRO services. Simply send in PFA-fixed samples, tell us about your aims, and we'll do the rest.

We have streamlined solutions for visualizing:

- Endogenous fluorescence
- c-FOS and neural activity
- Neurodegeneration markers
- A variety of other disease and cell-type markers



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