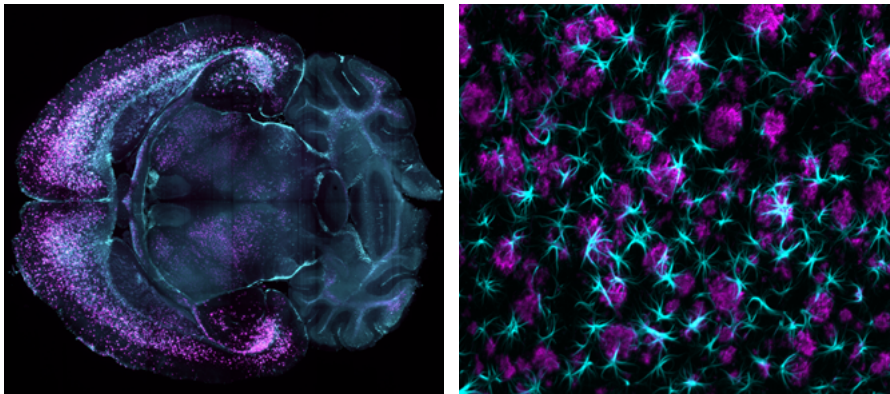


SmartSPIM

Light sheet imaging for rapid volumetric acquisition of intact samples

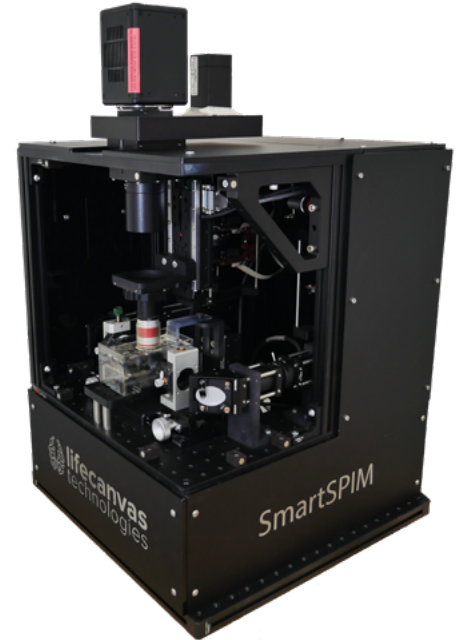
Generate high-quality data with SmartSPIM's sample-wide uniform axial resolution, tunable imaging parameters, and custom-designed imaging chamber. SmartSPIM leverages patented axial sweeping technology to provide homogeneous axial point spread functions (PSFz) across the entire field of view (FOV).



β-amyloid deposits (magenta) and astrocytes (cyan) at 3.6X (left) and 15X (right) in 5xFAD mouse brain from Drs. David Elliott and Jonathan Epp, University of Calgary.

FEATURES & HIGHLIGHTS

- **Fast volumetric imaging:** Image a mouse brain hemisphere or comparably sized sample in <30 minutes (at 20 fps, 1.8 μm x 1.8 μm x 4 μm voxel size).
- **Uniform axial resolution across sample:** Using a patented axial sweeping method, illumination optics scan the beam while synchronized to the camera's rolling shutter detection.
- **Optimal focus and illumination:** Compensates for refractive index mismatches and chromatic focal shifts. Custom Zemax illumination optics enhance achromatic performance across FOV.
- **Compatible with many samples:** Custom-designed imaging chamber accommodates tissues from organoids to rat brains, to entire juvenile mice, with dual illumination for large samples.
- **Intuitive user interface:** Streamlined acquisition software features real-time tile correction.

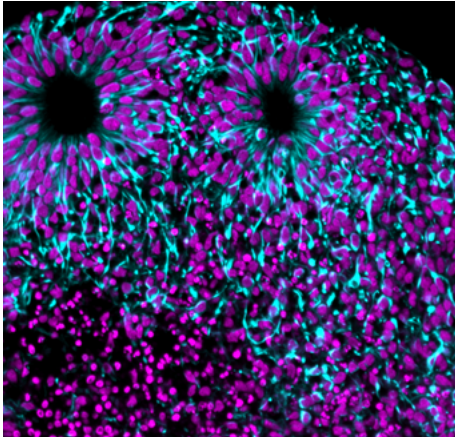


SPECIFICATIONS

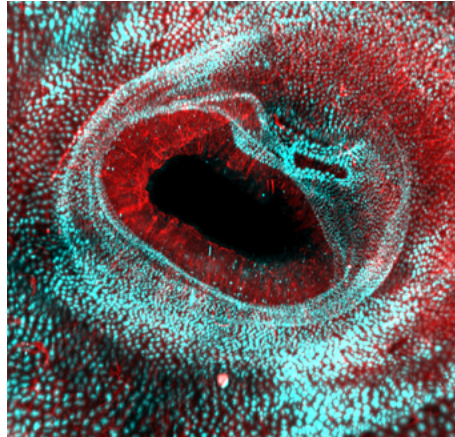
Light Sheet Formation	Dynamic axial sweeping (Dean et al. 2015)
Specimen Lateral Size	2.5 cm x 2.5 cm (standard) 4 cm x 6.5 cm (extended)
Illumination Optics	Custom designed objectives, NA = 0.125, broadband chromatically corrected
Detection Optics	180 mm EFL tube lens Objectives: 1.63X, 3.6X, 15X, 22X
Field of View (FOV)	3.6X: 3650 μm 15X: 850 μm
Lateral Sampling	3.6X: 1.8 μm/pixel 15X: 0.42 μm/pixel
Axial Resolution	3.6X : NA = 0.2, PSFz = 3.2-4.0 μm 15X : NA = 0.4, PSFz = 1.4-2.2 μm
Camera	2048 x 2048 sCMOS with rolling shutter synchronized to swept lightsheet
Imaging Rate	20 FPS during volumetric acquisition
Laser Lines	Up to 6, 405 - 785 nm

DIVERSE TISSUE AND SAMPLE TYPES

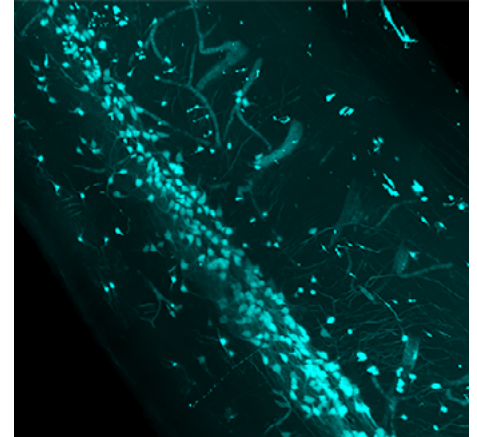
Acquire high-resolution images of various intact samples (left to right: **organoids**, **GI tract**, **spinal cord**).



Day 50 dorsal forebrain organoid from STEMCELL Technologies.



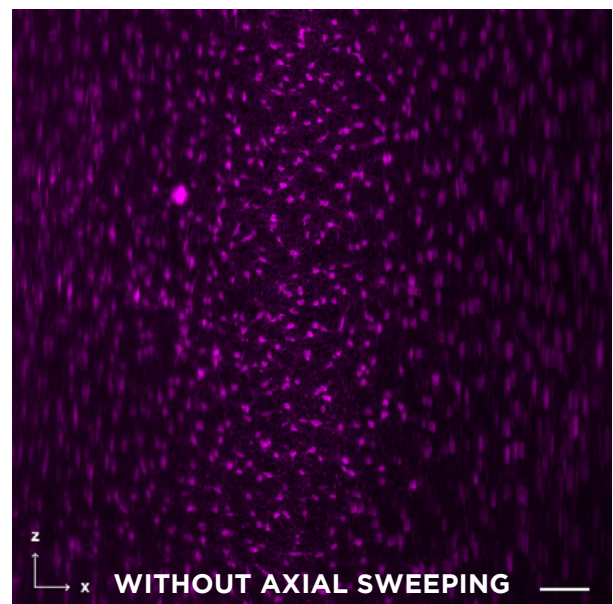
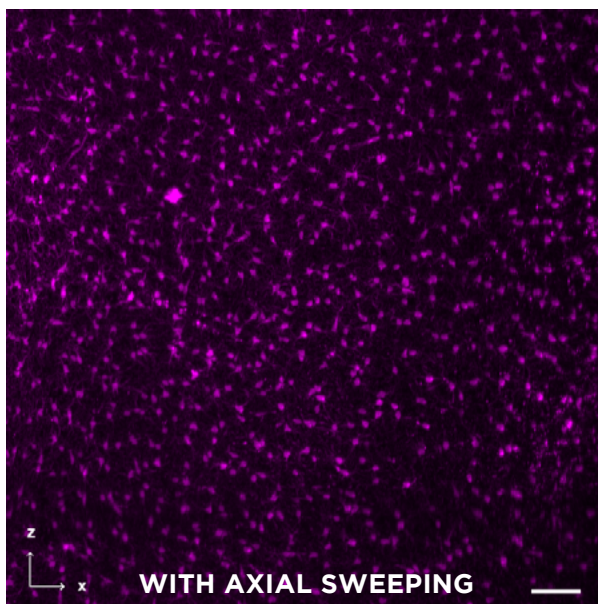
Mouse duodenum from Dr. Suhail Chaudhry, Icahn School of Medicine.



Mouse spinal cord from Dr. Helen Lai, UT Southwestern.

UNIFORM AXIAL RESOLUTION

Generate informative, high-quality data across the entire sample.



Microglia (IBA-1, 647 nm) in cortex of 7-month-old wild-type C57BL/6 male mouse from Taconic Biosciences, model #B6. 3.6X magnification. Scale bar = 100 μ m.