lifecanvas technologies

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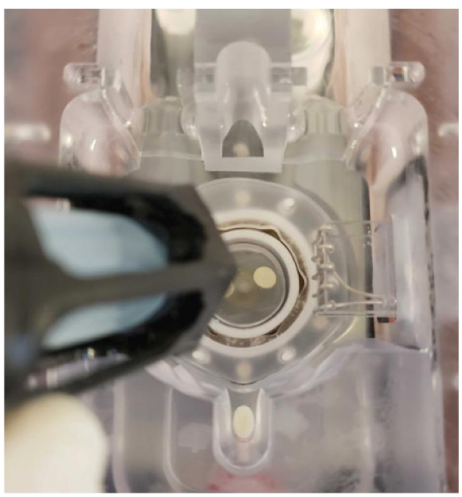
SMARTLABEL

The World's First Active Immunostaining Device for Intact Tissue Samples

Our advanced eFLASH protocol combines Stochastic Electrotransport technology and SWITCH histochemistry for fast, complete, & uniform labeling.



Our unique sample cup allows for easy handling of cleared tissue samples and reliable plug-&-play loading into one of SmartLabel's two labeling chambers.

FAST, EASY, AND EFFICIENT

Fast: Label large, intact samples such as rodent organs an order of magnitude faster than with passive labeling (≤ 24 hours vs. weeks to months).

Easy: Turnkey operation—simply load the buffers and your sample & probes. Perform 2 distinct labeling experiments simultaneously thanks to SmartLabel's dual chamber design.

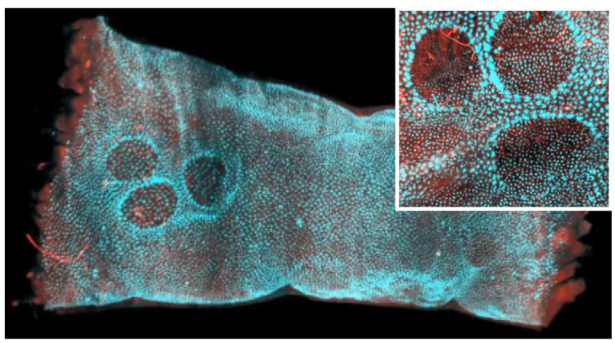
Efficient: Uses a small amount of antibody (as little as ~3 µg) to label tissues the size of a whole mouse brain.

COMPLETE AND UNIFORM LABELING

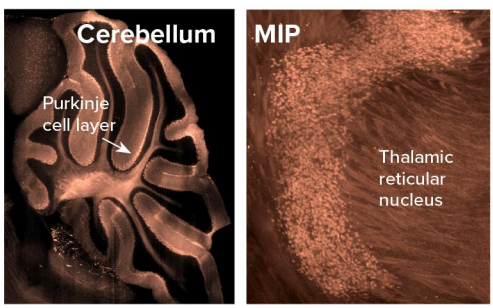
- Achieve unparalleled uniformity of signal intensity from surface to core using LifeCanvas's advanced eFLASH (Yun et al., 2019) protocol.
- Combines rapid, Stochastic Electrotransport-mediated (Kim et al., 2015) infiltration of probes into tissue with the SWITCH technique (Murray et al., 2015) of controlling probe binding kinetics.
- Prevents antibody depletion caused by excessive binding to superficial tissue sites and ensures the sample's center is well-labeled.

COMPATIBLE WITH MANY CLEARED-TISSUE TECHNIQUES

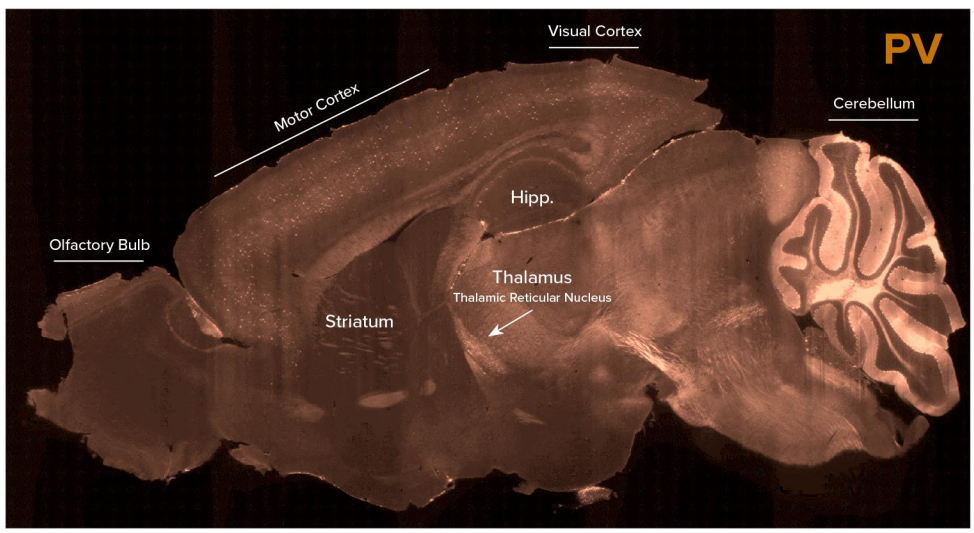
SHIELD (Park et al., 2018), SWITCH, and MAP (Ku et al., 2016)



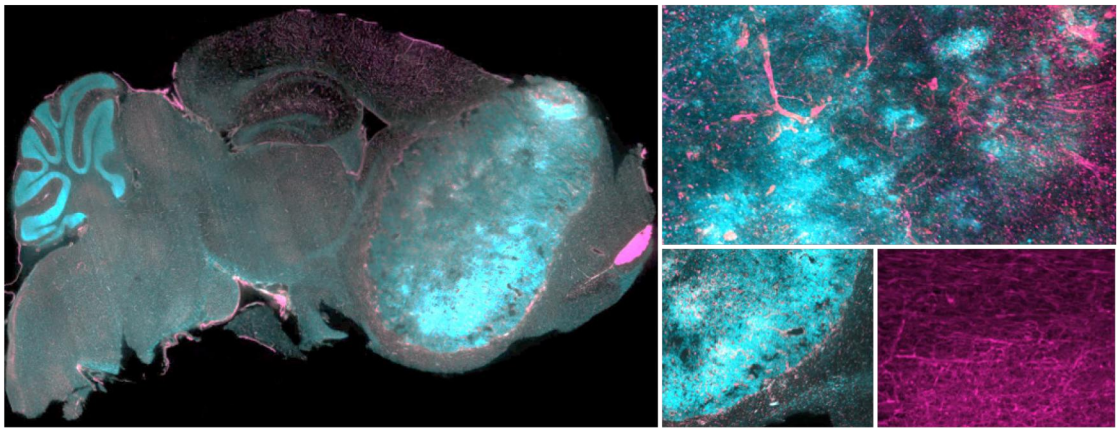
Volume rendering of a mouse small intestine segment labeled with a stem cell marker (anti-Olfm4, cyan) using SmartLabel. A fluorescent tomato lectin conjugate (delivered IV, red) is also shown. Inset shows detailed view of the same sample.



Rapid, one-step immuno-staining of a subset of inhibitory neurons in a mouse brain hemisphere in SmartLabel by combining anti-Parvalbumin (PV) primary & a Fab fragment secondary. A sagittal plane showcasing highly uniform staining ~1 mm in from the medial surface is shown, with the inset maximum intensity projection highlighting complete labeling of the deep-to-surface thalamic reticular nucleus.



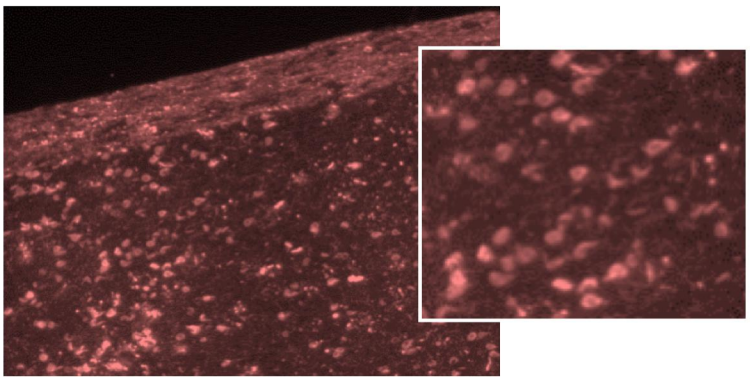
APPLICATION HIGHLIGHT: GET A NEW PERSPECTIVE ON DISEASE



Xenograft models are an essential tool for neuro-oncology researchers. Monitoring the spatial distribution and growth of intracranially-implanted tumors requires non-invasive live-imaging methods such as positron emission tomography (PET). Here, to assist researchers validate a novel PET tracer, LifeCanvas scientists preserved, cleared, labeled, and imaged at single-cell resolution a mouse brain hemisphere harboring a xenografted striatal tumor. SYTO16 (cyan) nuclear stain and DyLight 649-conjugated tomato lectin (magenta) vascular stain together highlight the tumor's morphology and its impact on surrounding tissue.

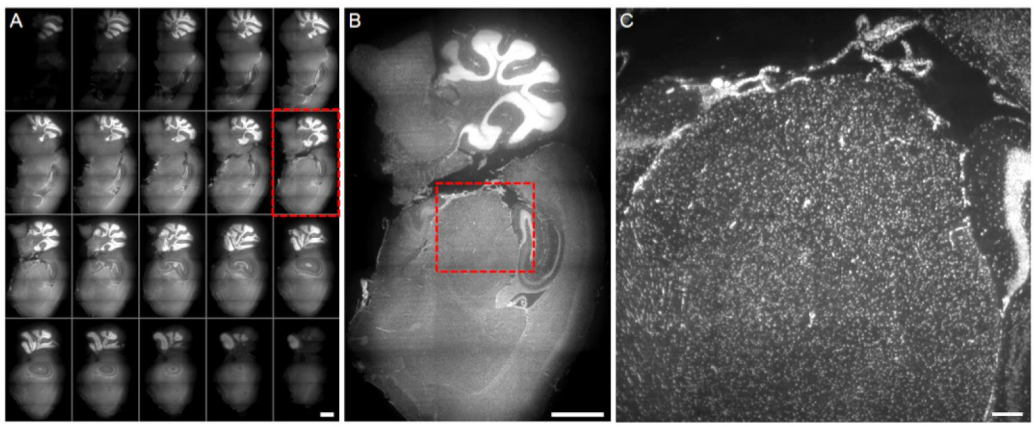
BECOME AN EARLY ADOPTER TO RECEIVE THE FOLLOWING BENEFITS:

- Gain a competitive edge in whole-organ labeling and receive individualized technical support designed to get you generating quality data quickly.
- Exchange tissue samples with LifeCanvas scientists at various stages of the preservation, clearing, labeling, & imaging pipeline to get feedback on your preparation skills and master the entire workflow easily.
- Exclusive opportunity to have LifeCanvas validate new antibodies or labeling reagents of your choice for your specific tissue type & application.



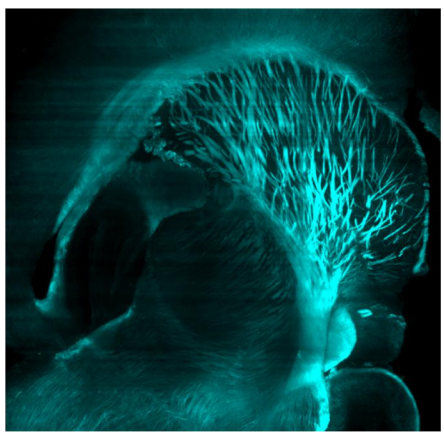
RAPIDLY STAIN POSTMORTEM HUMAN TISSUE

Multi-millimeter thick slab of frontal cortex labeled in < 24hrs in one step with anti- Phospho-Tau (mAb clone AT8) in SmartLabel, following preservation by SHIELD post-fix and delipidation in SmartClear II Pro. (MIP through 400 µm tissue.)



Above: Images of a mouse hemisphere fixed with **SHIELD**, cleared with **SmartClear II Pro**, labeled intact with **SmartLabel** using a red fluorescent nuclear dye (TO-PRO-3), and imaged with **SmartSPIM**.
A) Montage of 300 µm-spaced z-planes showing complete & uniform TO-PRO-3 staining. Raw data collected with 4 µm axial spacing and 1.82 µm lateral pixel size (3.6x, NA 0.2 objective). Scale bar, 2 mm. **B)** Larger view of plane outlined in A. Scale bar, 2 mm. **C)** Larger view of region outlined in B showing cell-level labeling. Scale bar, 250 µm.

Below: Myelinated axon tracts visualized in mouse striatum. Intact brain hemisphere labeled with anti-MBP using **SmartLabel**.



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