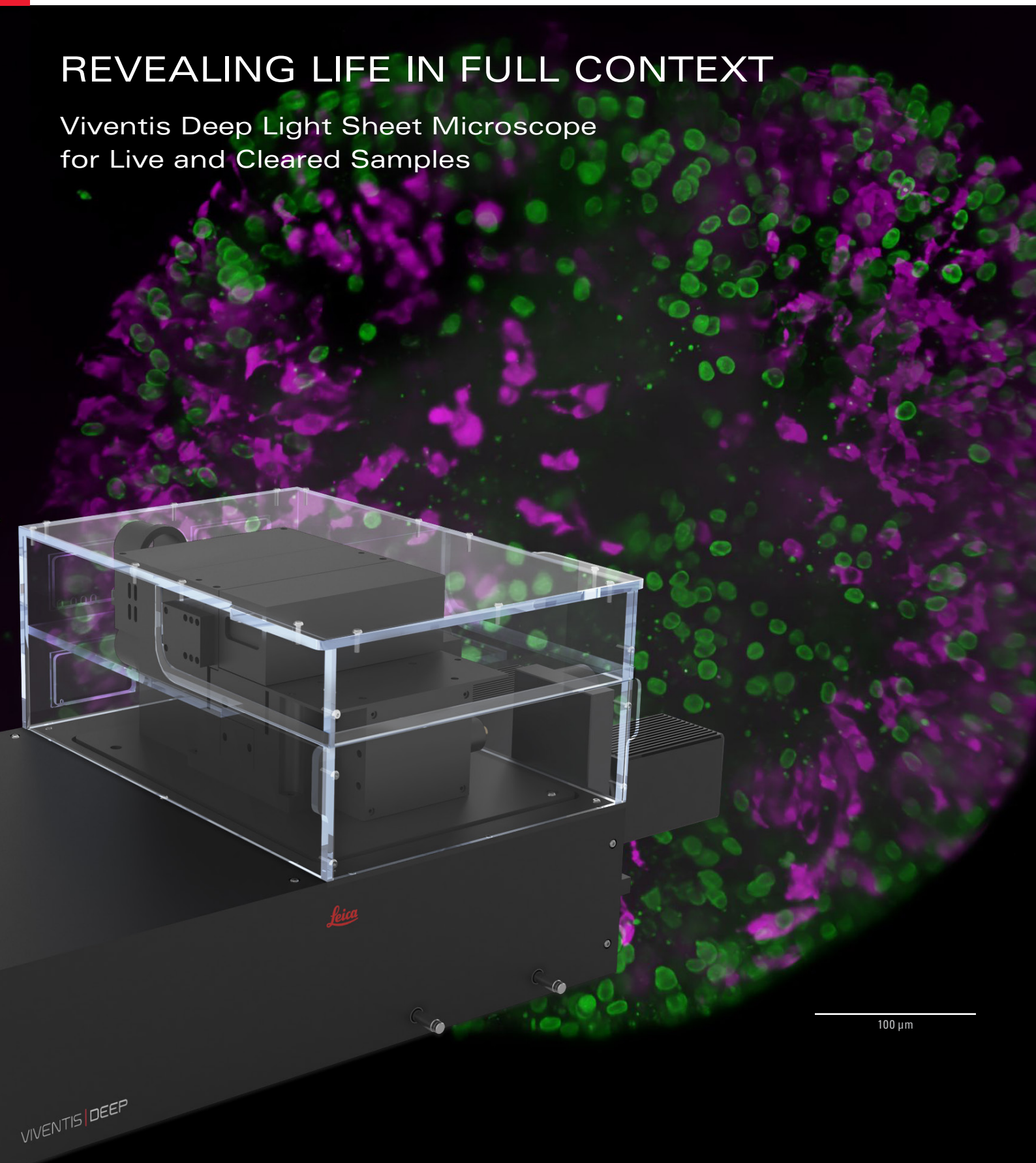
From Eye to Insight

Leica
MICROSYSTEMS

REVEALING LIFE IN FULL CONTEXT

Viventis Deep Light Sheet Microscope for Live and Cleared Samples



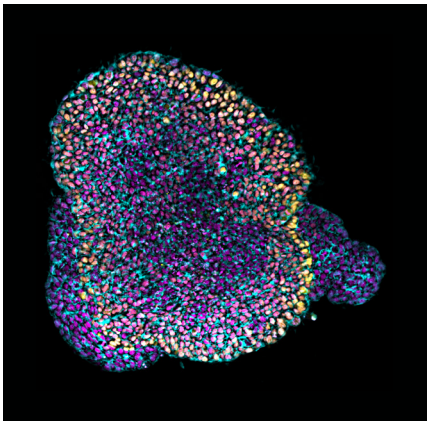
Viventis Deep

MULTI-VIEW AND MULTI-POSITION LIGHT SHEET IMAGING TO ILLUMINATE LIFE IN ITS ENTIRETY

Begin your journey with Viventis Deep to unveil the intricate details and dynamic processes of biological systems.

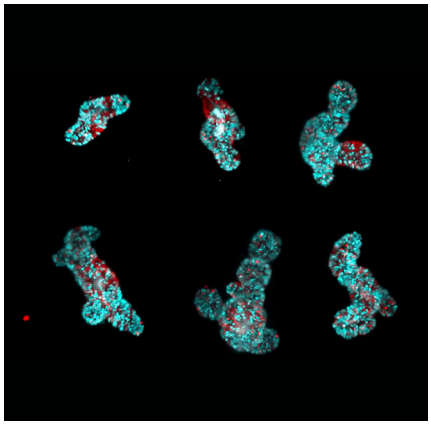
The Viventis Deep light sheet system is designed for imaging both live and cleared samples. For long-term live imaging, you can leverage its unique dual illumination and dual view in combination with multi-well and multi-position capabilities to illuminate life in its entirety as it develops.

By simply switching the replaceable optics, you can adapt the system for imaging of cleared samples to visualize whole-tissue architecture in depth.



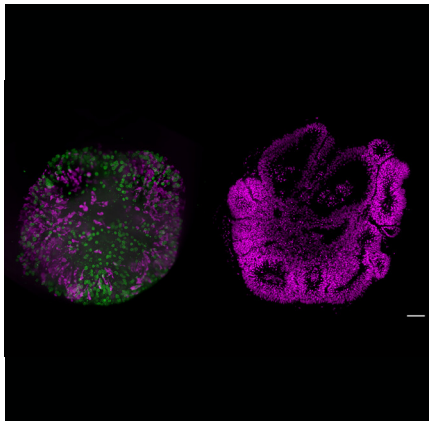
Explore life in depth

Follow the spatio-temporal changes in your systems as they develop from single cells into tissues or whole organisms with deep volumetric imaging.



Explore life events through long-term imaging

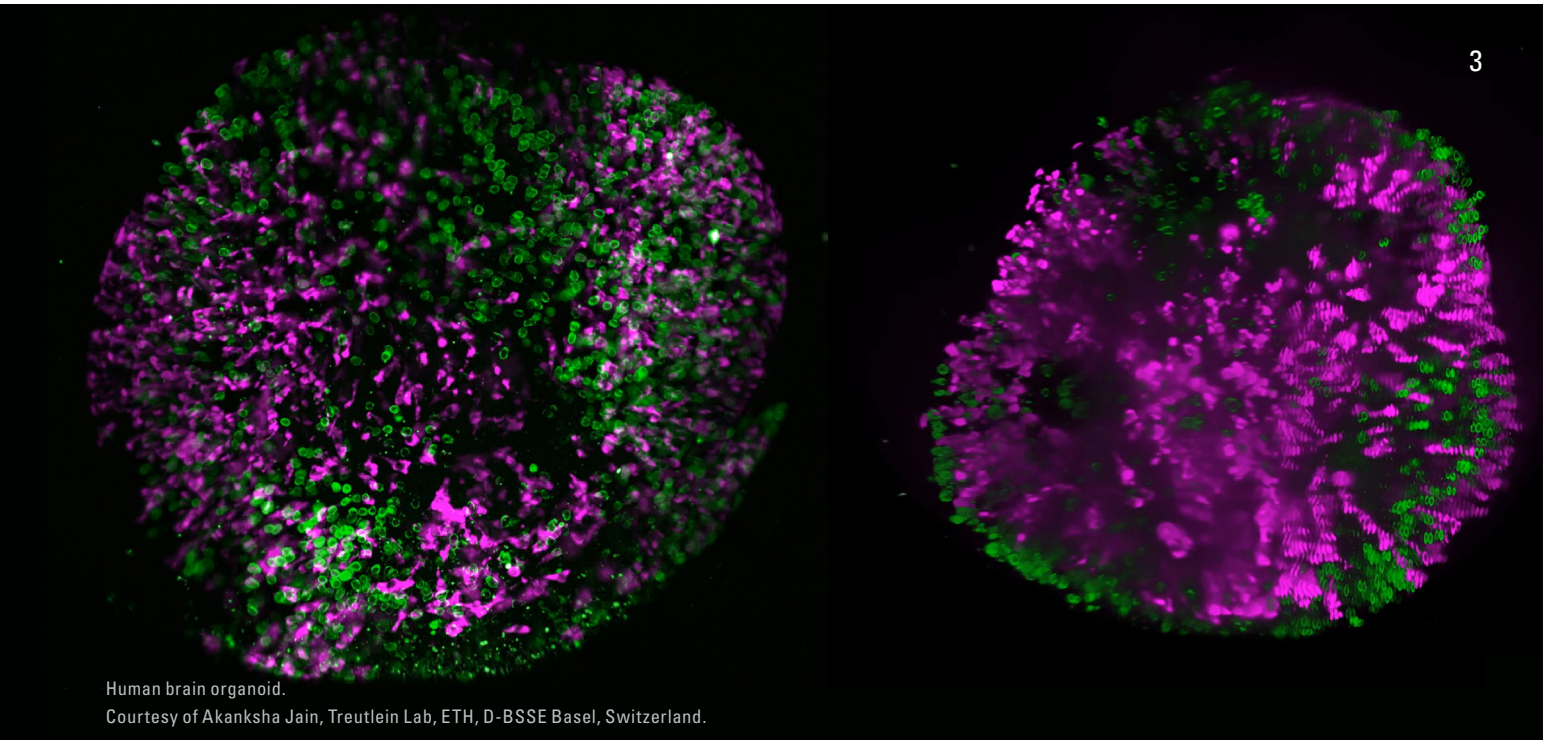
Gentle light sheet technology allows for rapid volumetric imaging while preserving sample viability.



Explore live and cleared samples in one system

Viventis Deep offers high flexibility for imaging both live and cleared samples- simply by exchanging the detection optics.

Title page: Brain organoids labeled with lamin (green) and tubulin (magenta). Courtesy of Akanksha Jain. Treutlein Lab ETH-DBSSE, Basel, Switzerland.



Human brain organoid.
Courtesy of Akanksha Jain, Treutlein Lab, ETH, D-BSSE Basel, Switzerland.

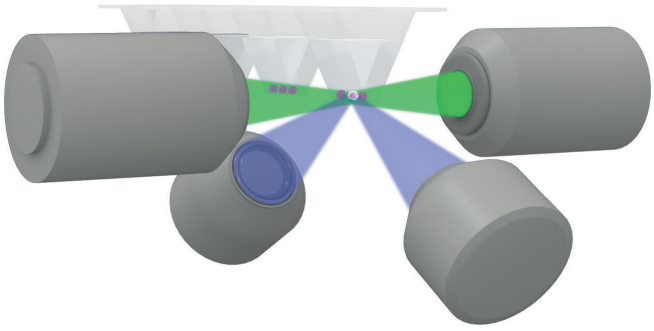
EXPLORE LIFE IN DEPTH

The Viventis Deep light sheet microscope helps you to expand the understanding of your sample to its full depth, thanks to increased spatio-temporal resolution.

Achieve detailed volumetric imaging for a complete view of the sample with a patented combination of:

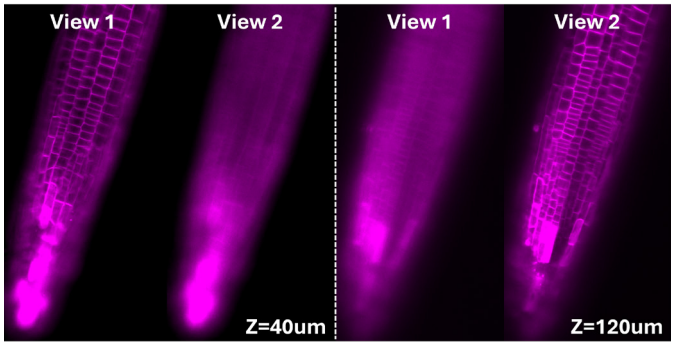
- Dual illumination
- Dual view detection
- Open top multi-position sample holder

Viventis Deep enables you to image complex, light-scattering samples in depth and over time, even when they grow, giving you the resolution and context needed for meaningful downstream analysis, whilst maintaining sample viability due to gentle light sheet imaging.

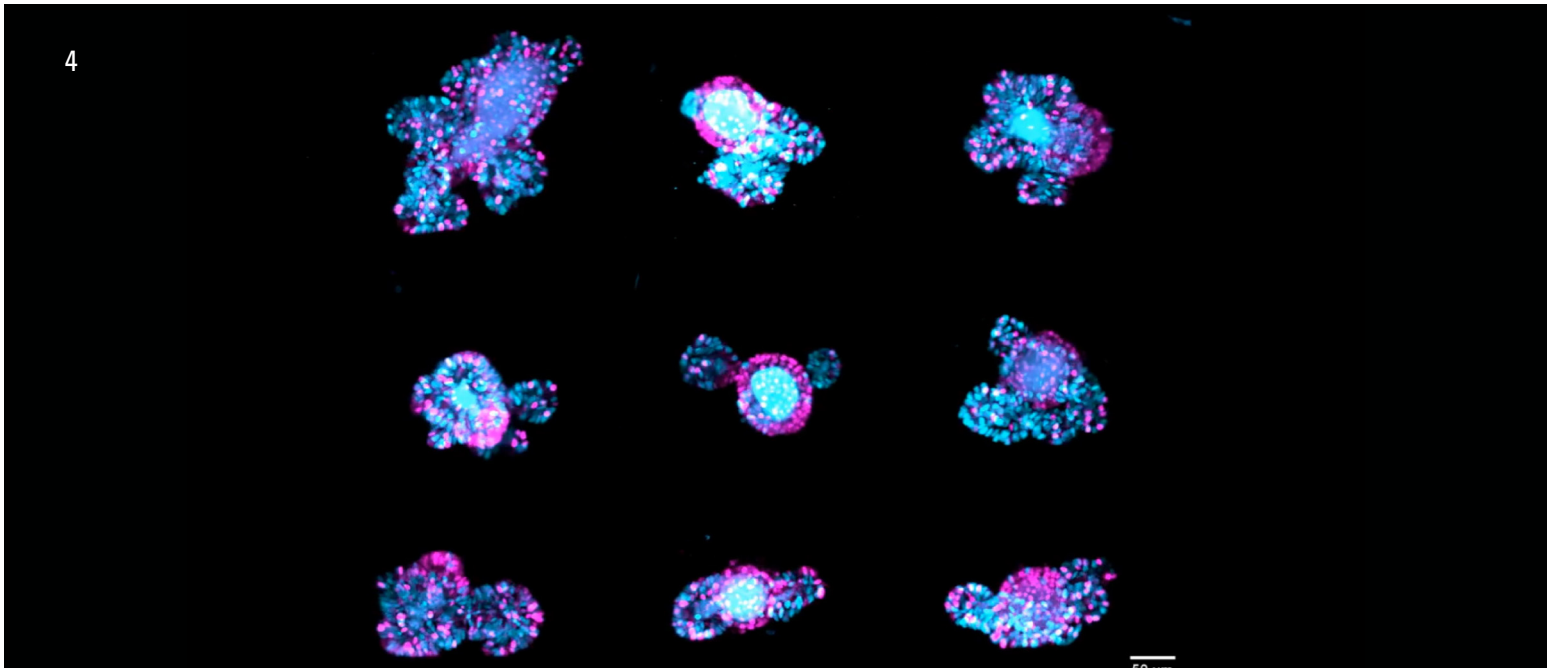


Viventis Deep is the only commercial light sheet microscope offering a multi-well, open-top configuration with dual-sided illumination and dual view detection.

It is therefore the ideal system for in toto, long-term imaging of large multicellular systems, enabling a complete view of the sample at single-cell resolution.



The dual view detection system maintains image quality across the sample volume. In scattering samples like the Arabidopsis root (plasma membranes in magenta), image quality declines with increasing depth. The panels display identical z-planes at depths of 40 µm and 120 µm, acquired with View 1 and View 2 respectively, clearly highlighting the application advantage of dual view detection.
Courtesy of Jia Pang, Geldner group, University of Lausanne, Switzerland.



Murine intestinal organoid. Moos, F., Suppinger, S., de Medeiros, G. et al. Open-top multisample dual-view light-sheet microscope for live imaging of large multicellular systems. Nat Methods 21, 798–803 (2024).

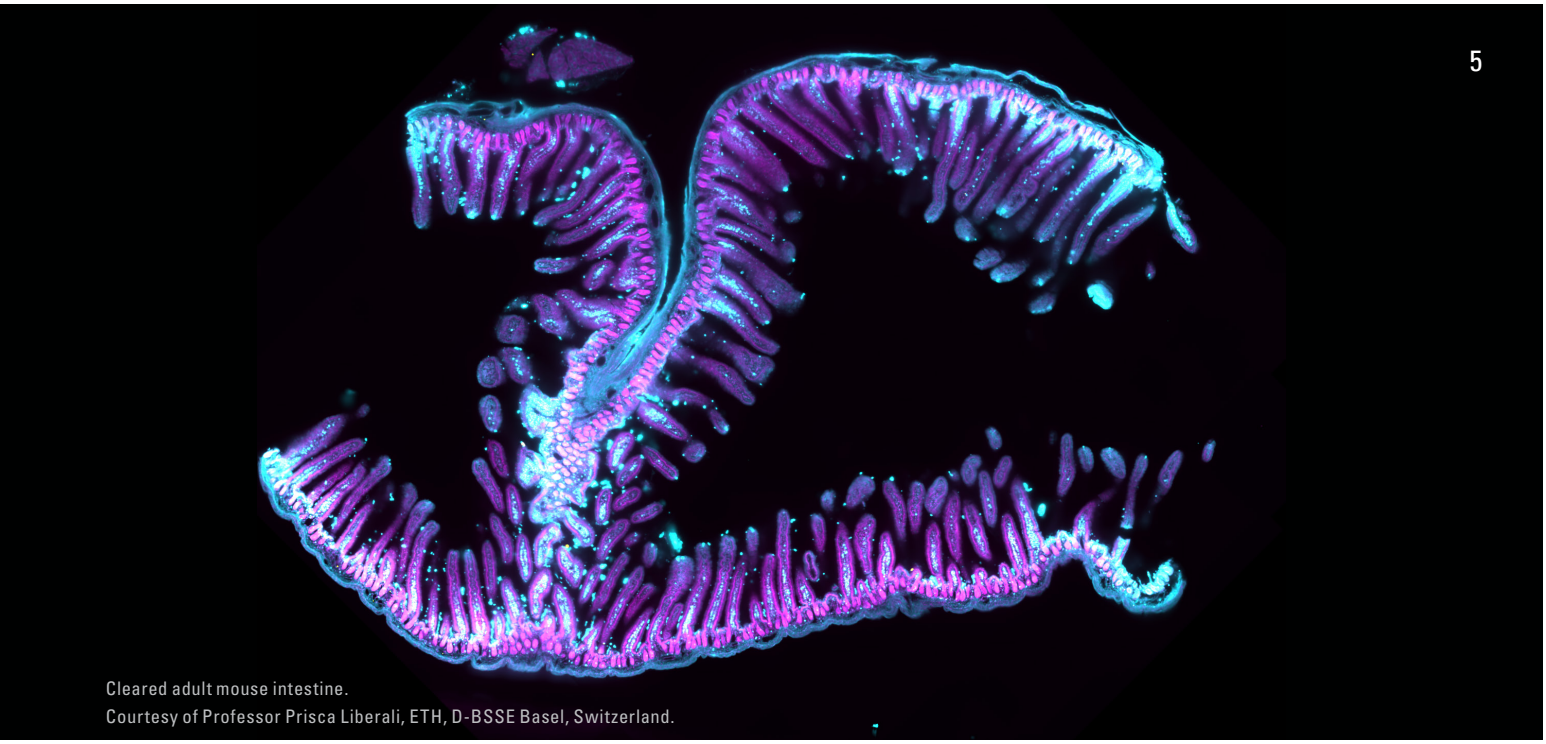
EXPLORE LIFE EVENTS WITH LONG-TERM IMAGING

Light sheet microscopy is uniquely suited for imaging living, complex biological systems. By illuminating only the imaging plane, it minimizes phototoxicity and photobleaching while enabling rapid, high-resolution volumetric acquisition. This gentle yet powerful approach preserves sample viability over extended periods, making it ideal for long-term, in toto imaging of multicellular systems such as organoids, embryos, and intact tissues.

In addition, the advanced incubation solution and easy media exchange even during a running experiment preserves physiological conditions. Drugs can be added and photomanipulation performed seamlessly during live time-lapse experiments, enabling precise intervention while imaging is ongoing.

Top: The open-top multi-well sample holder allows easy sample mounting in separate wells. Various well types are available depending on sample requirements, including options for floating samples or those embedded in extracellular matrix (e.g., Matrigel).

Bottom: Samples can grow inside the sample holder and be placed in a regular cell culture incubator, thanks to the convenient sample holder stand and sample holder lid. They can then be transferred to the Viventis Deep when ready for imaging.

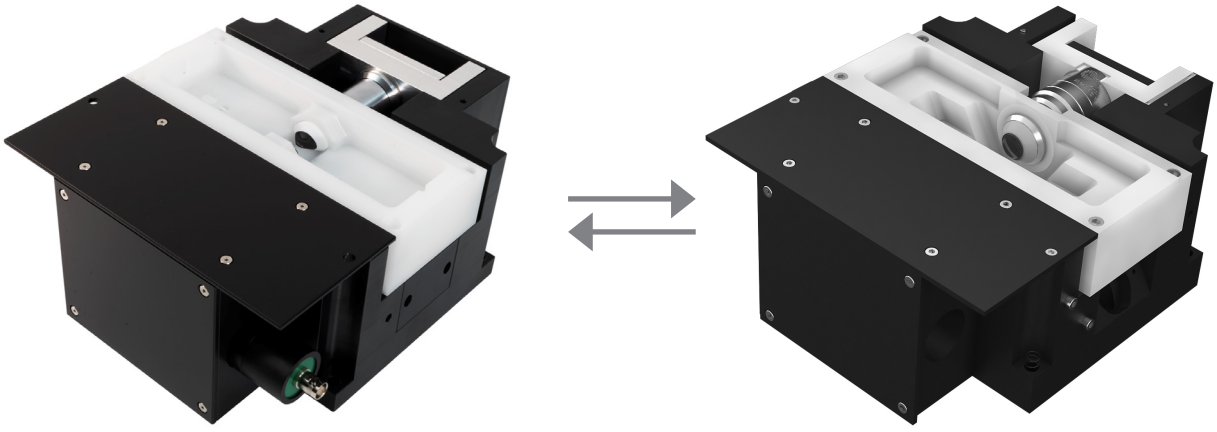


Cleared adult mouse intestine.
Courtesy of Professor Prisca Liberali, ETH, D-BSSE Basel, Switzerland.

EXPLORE LIVE AND CLEARED SAMPLES IN ONE SYSTEM

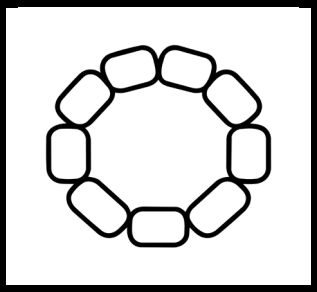
The combination of live and fixed or cleared imaging experiments is crucial for capturing both dynamic information and molecular and architectural context from your sample. Viventis Deep delivers deep imaging for live and cleared samples in a single system — simply by exchanging the objective blocks.

The cleared-sample module is designed for a high degree of flexibility, accommodating a wide range of clearing media (from RI 1.33 up to RI 1.56), and supporting samples from hundreds of micrometers up to 9x6x6 mm in size. As cleared samples often exceed the field of view, Viventis Deep features integrated tiling and stitching functionalities to enable seamless imaging of large volumes.

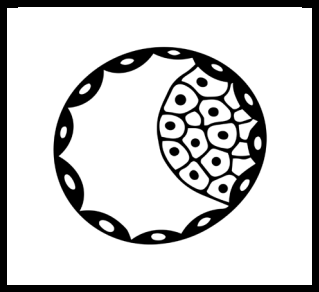


Left: The live imaging block is equipped with two illumination and two detection objectives (25X or 16X) compatible with water immersion. **Right:** The cleared imaging block has two illumination and one detection 24X multi-immersion objective. The user can exchange the two blocks with help of a software-assisted procedure.

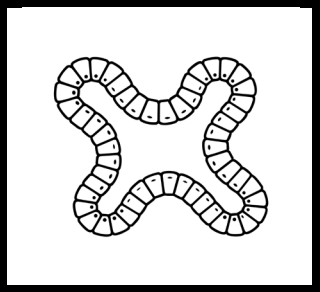
APPLICATION EXAMPLES OF VIVENTIS DEEP



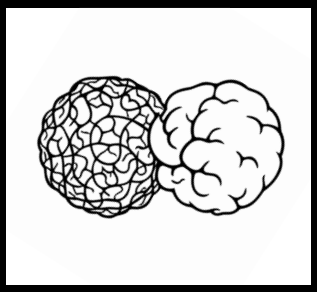
Spheroids



Small embryos
(mouse, C.elegans)



Organoids

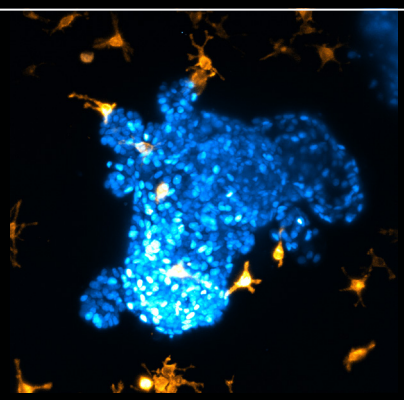


Assembloids

Live Imaging

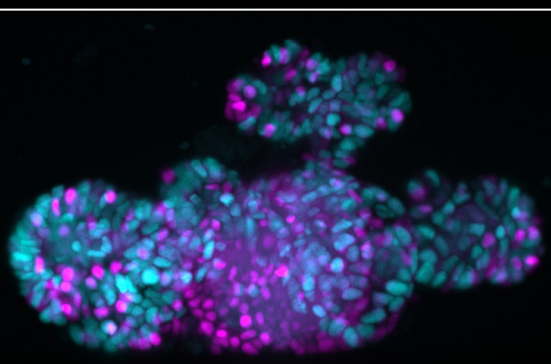
50 µm 100 µm 300 µm

1



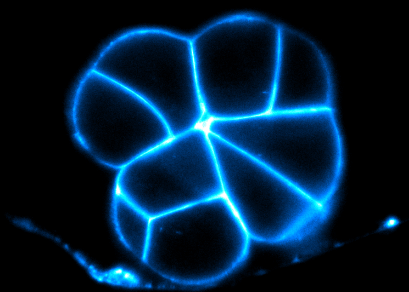
Co-culture of a mammary gland organoid and macrophages.

2



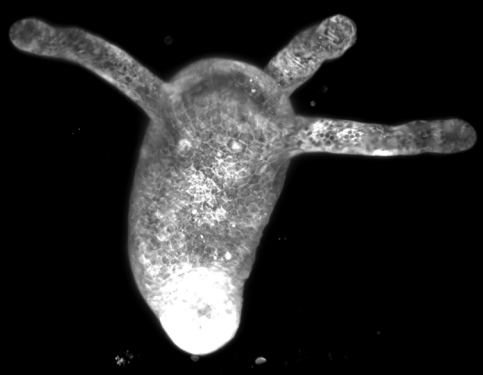
Intestinal organoid

5



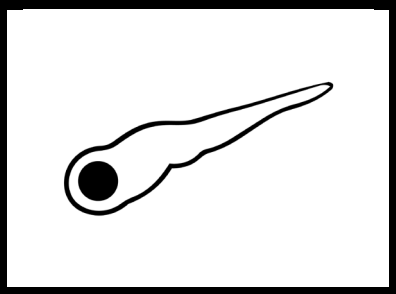
Ascidian embryo

6

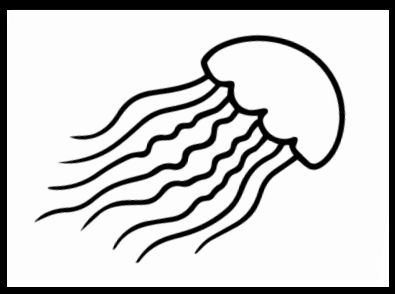


Hydra

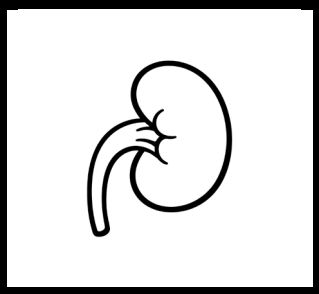
Acknowledgements on page 8



Model organism:
e.g Zebrafish, Drosophila



Model organism:
Marine biology, plants



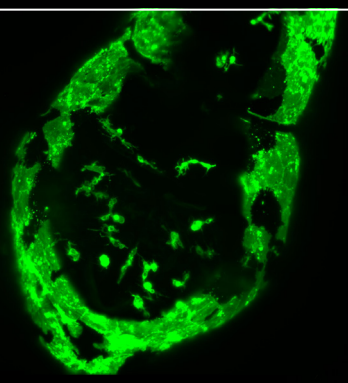
Small organs / Tissue biopsy

Cleared Imaging

to 1 - 2 mm

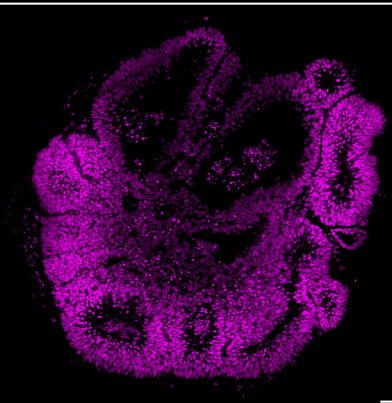
Up to 9x6x6 mm

3



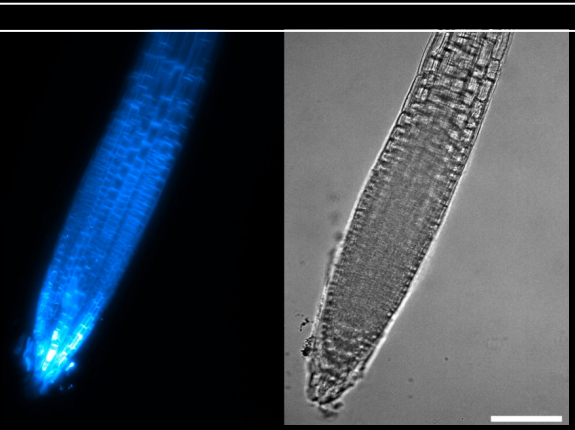
Zebrafish

4



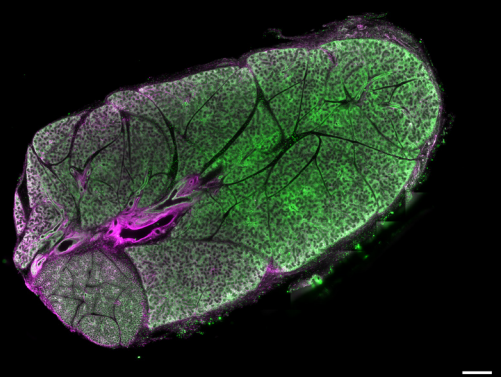
Human organoid, cleared sample

7



Arabidopsis Thalian

8



Salivary Gland, cleared sample

ACKNOWLEDGEMENTS

Application examples courtesy of

1. Aurelie Chiche, Li lab, Pasteur Institute, Paris, France
2. Franziska Moos, Liberali Lab, ETH, D-BSSE Basel, Switzerland
3. Francesca Peri, University of Zurich, Switzerland
4. Treutlein Lab, ETH, D-BSSE Basel, Switzerland
5. Daniel Gonzalez Suarez, LBDV, Villefranche-sur-Mer, France
6. Tsiairis lab, FMI, Switzerland
7. Jia Pang, Geldner group, University of Lausanne, Switzerland
8. Prisca Liberali, ETH-DBSSE Basel, Switzerland

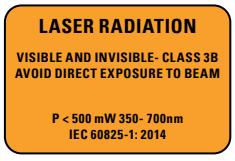
LEICA SERVICE FOR VIVENTIS DEEP

Enabling your success with complete workflow support

Keep your operations running around the globe with best-in-class services entirely dedicated to microscopy and over 170 years of history.

Key features

> Leica Team: 500+ Service & Application experts
> Leica Training: 4-level factory certification program
> Leica Logistics: 5 regional hubs for genuine parts
> Leica One*Call*: PhD-level hotline assistance



CONNECT WITH US!

danaher

Leica Microsystems CMS GmbH | Ernst-Leitz-Strasse 17–37 | D-35578 Wetzlar (Germany)
Tel. +49 (0) 6441 29-0 | F +49 (0) 6441 29-2599

https://go.leica-ms.com/viventis-deep