Human Brain Project

di2CLSFM

Light Sheet Fluorescence Microscope

European Laboratory for Non-linear

Explore **centimeter-sized** biological samples at **sub-cellular resolution** within minutes with our **high-throughput Light Sheet Fluorescence Microscope**

TECHNOLOGY DESCRIPTION

Our dual-view inverted confocal light sheet fluorescence microscope (di2CLSFM) can resolve sub-cellular morphology over centimeter-sized cleared tissues at state-of the art acquisition speed. By leveraging the two orthogonal views, it provides an almost isotropic micrometric resolution. Such design, paired with automated machine-learning image analysis, enables novel cytoarchitectural studies of large biological samples with minimal damage, paving the way to mapping the whole human brain.

Map-out large samples: analyze intact cell morphology and distribution over centimeter sized volumes with automated machine-learning tools.

Fast throughput with micrometric resolution: acquire two orthogonal and complementary views of the sample at up to 100 frames per second and merge them to explore the volume with sub-cellular isotropic resolution.

AREAS

High-throughput microscopy | Neuronal imaging

3D histology

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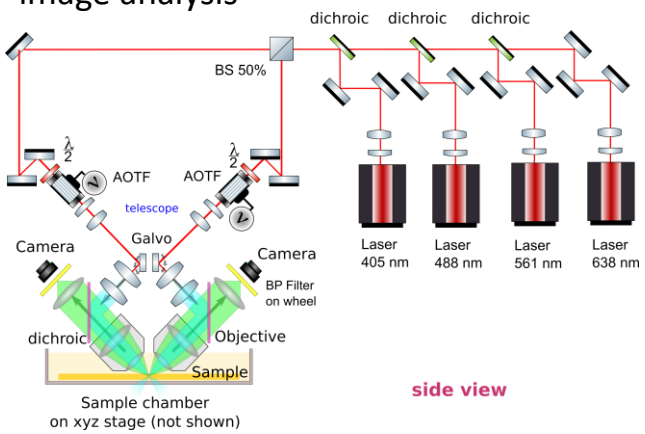
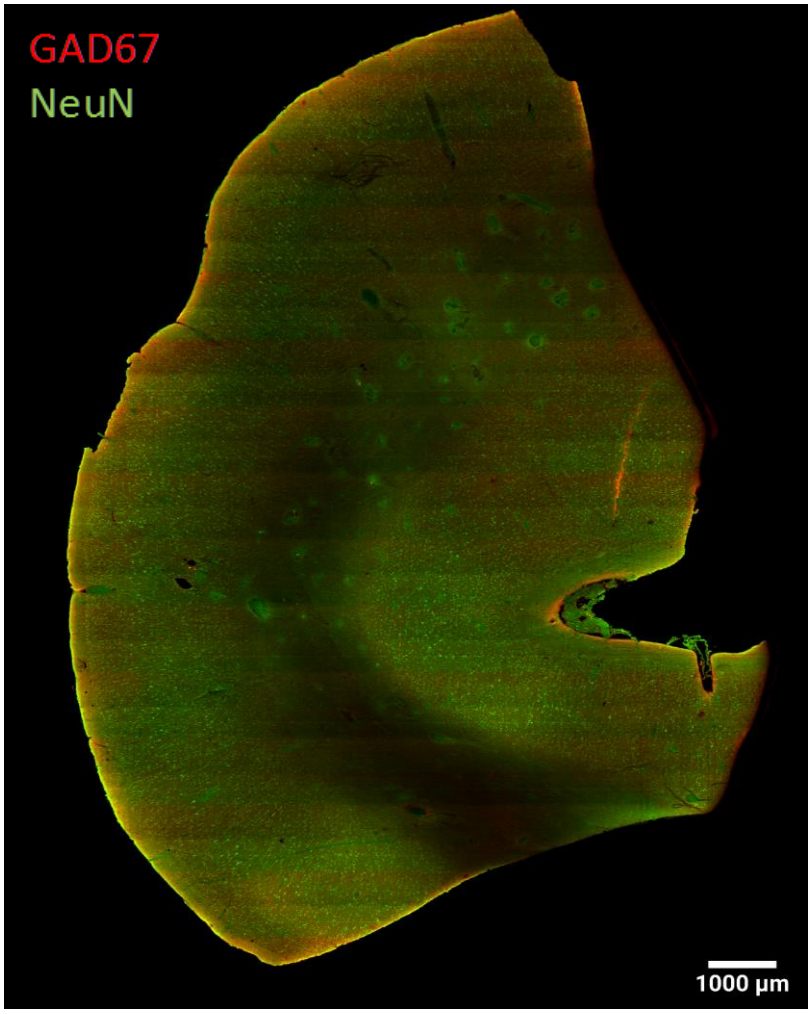
COMPETITIVE ADVANTAGES

- State of the art acquisition speed
- Near isotropic micrometric resolution
- Four excitation and detection channels for fluorescence-based cell type discrimination
- Robust and automated machine-learning image analysis



Map with di2CLSFM the cytoarchitecture of large samples from the cellular to the organ scale



APPLICATION & MARKET POTENTIAL

- **Biological research:** map out the long-range cellular structure and organization of any biological sample within hours.
- **Preclinical research:** enable large scale studies of pathology induced tissue changes, providing valuable insight towards the development of novel therapeutic treatments.
- **Histopathological analysis:** improve the speed of medical histological exams and extend it to 3D for a higher level of anatomical insight and more reliable diagnosis.

TECHNOLOGY READINESS LEVEL

1 2 3 4 5 **6** 7 8 9

REFERENCES

- di2CLSFM used within Human Brain Project to map a whole human Hippocampus.
- Collaboration with Bioretics (http://www.bioretics.com/) for AI assisted image analytics.
- Collaboration with University of Florence and National Research Council for technology R&D.

CONTACT

Vladislav Gavryusev
LENS | Florence | Italy |
gavryuse@lens.unifi.it

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Tech sheet designed and co-developed by Universidad Politécnica de Madrid