3D *ex vivo* imaging and characterization of vascular network in rodent brain cortex

Tissues & Organs • Light Sheet • Advanced Media • Vascular Network • Neurosciences • Oncology • Traumatology

YOUR NEEDS

- Study of the impact of pathologies on the brain micro-vascular network
- Preclinical study of treatment efficacy

OUR SOLUTIONS

- Light sheet microscopy and clearing to characterize the vascular network in 3D
- Automated 3D image processing for micro-vascular network quantification

General Procedure

Prior to sample collection by Imactiv-3D:

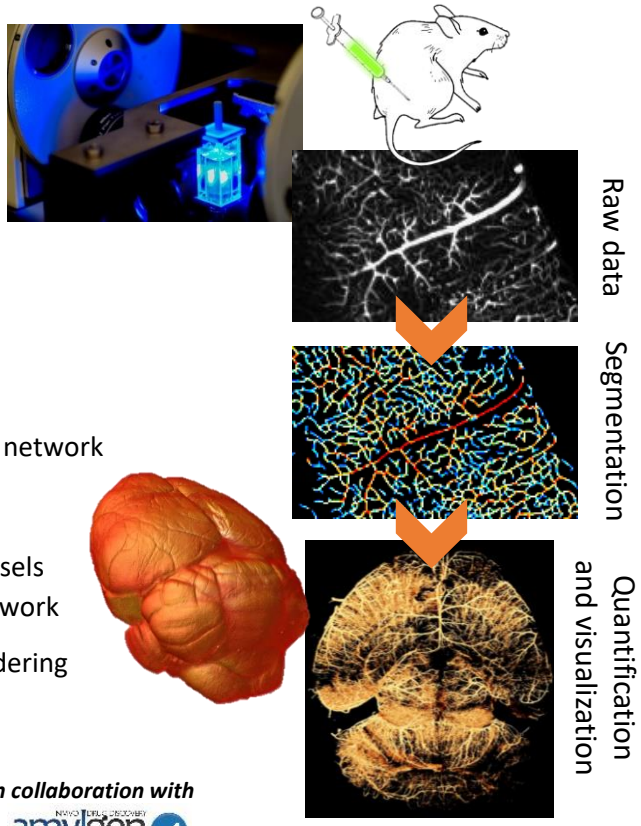
- In vivo labelling by infusion with a fluorescent lectin before euthanasia
- Formalin fixation of extracted sample

Image acquisition:

- Optical clearing of samples
- 3D light sheet fluorescence microscopy
- Multi-position acquisition

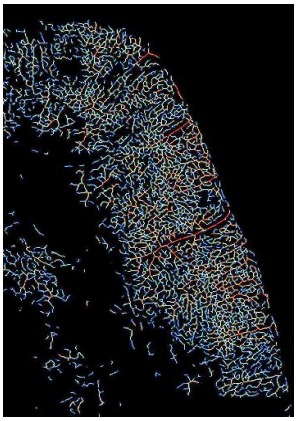
Image processing and analysis:

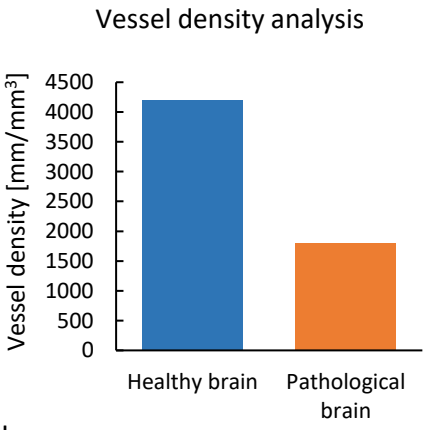
- Quantitative characterization of the vascular network
  - Vessels segmentation
  - Extraction of efficient volume
  - Computation of parameters of interest: vessels length and local size, density of the vascular network
- 3D visualization with surface and volume rendering
  - Reconstruction of the whole sample
  - Advanced display using 3D animations

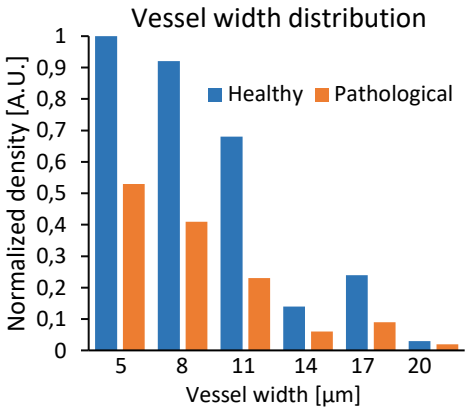


Application example

in collaboration with amylgen







Study of Alzheimer pathology:

- Healthy brain versus pathology-induced brain.
- Diseased brain cortex shows a drastic decrease in vascular network density, together with a modified distribution of the vessels size.
- Results consistent with the inflammation induction described in the literature.

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