

High-throughput in-flow imaging of intact organoids and tissue (mimics) with cellular resolution

Commonly used acronym: INFLUXO

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Organisation

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Department Veterinary Sciences

Country Belgium

Geographical Area Flemish Region

SCOPE OF THE METHOD

The Method relates to	Animal health, Human health
The Method is situated in	Basic Research, Regulatory use - Routine production
Type of method	In vitro - Ex vivo
Specify the type of cells/tissues/organs	iPSC-derived organoids and assembloids, patient-derived tumouroids and cuboids

DESCRIPTION

Method keywords

cerebral organoids

organoids

light sheet imaging

High-throughput screening

high-content image analysis

fluorescence microscope

Scientific area keywords

neuroscience

cancer

Developmental biology

drug delivery

drug screening

cell biology

Method description

Modern cell and developmental biology increasingly rely on 3D cell systems such as organoids. However, the inability to characterize these specimens at the cellular level with high throughput hampers their integration in routine screening settings. To address this bottleneck, we have developed a module for imaging organoids and tissue (mimics) in flow, based on a transparent agarose fluidic chip that enables efficient and consistent 3D recordings with theoretically unlimited throughput. Downstream high-content image analysis enables absolute quantification with cellular resolution. By design, the platform offers a cost-effective, accessible, and efficient solution for fast and absolute 3D histopathology on essentially any microscope.

Lab equipment

Light sheet microscope or confocal microscope

Method status

Still in development

Internally validated

Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages

1. Non-invasive and absolute organ(oid) imaging;
2. Virtually unlimited throughput with gentle sample handling;
3. Not limited by sample size or microscope setup;
4. Simple control and design flexibility guarantee wide applicability.

Challenges

Thicker samples demand clearing for full-depth characterization.

Future & Other applications

Easily extendible to other 3D samples such as biofabricated constructs and patient-derived biopsies for comprehensive characterization of cell composition and organisation enabling true 3D histopathology

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

De Beuckeleer et al., 2025. An agarose fluidic chip for high-throughput in toto organoid imaging (DOI: 10.1039/D4LC00459K)

Van De Looverbosch et al., 2025. Proximity adjusted centroid mapping for accurate detection of nuclei in dense 3D cell systems (DOI: 10.1016/j.compbiomed.2024.109561)

Associated documents

[2025 De Beuckeleer Lab Chip.pdf](#)

Links

[An agarose fluidic chip for high-throughput in toto organoid imaging](#)

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