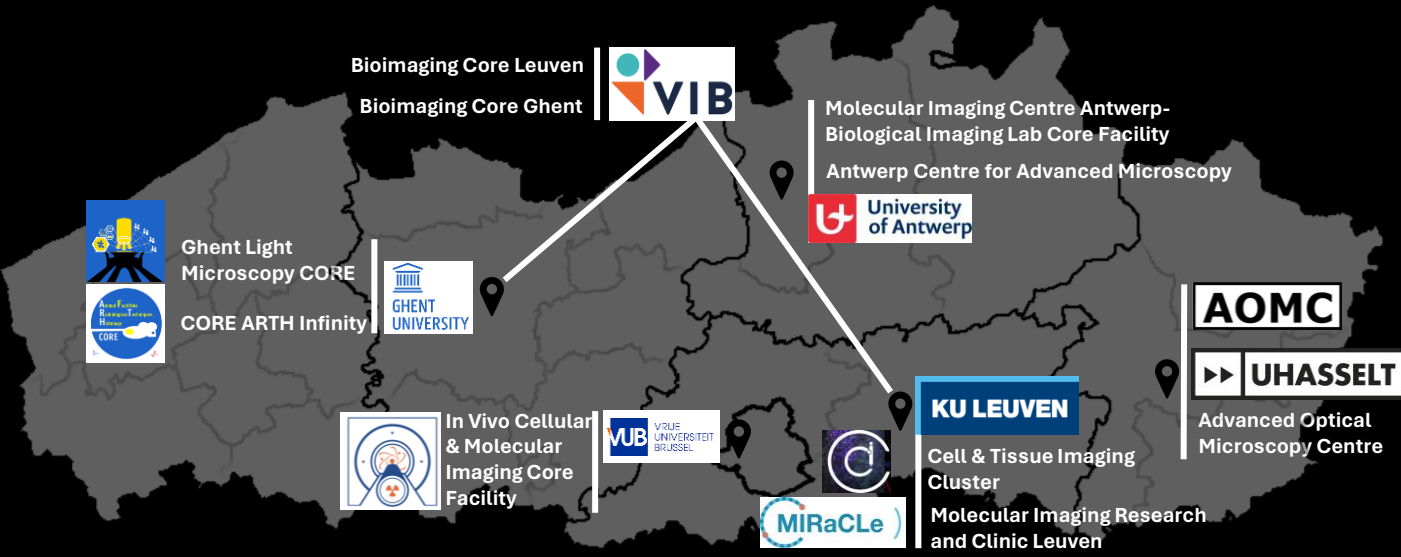


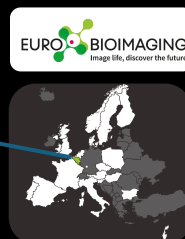
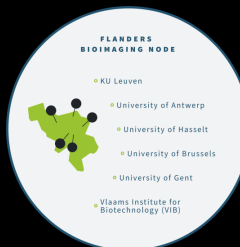


Flanders Bioimaging

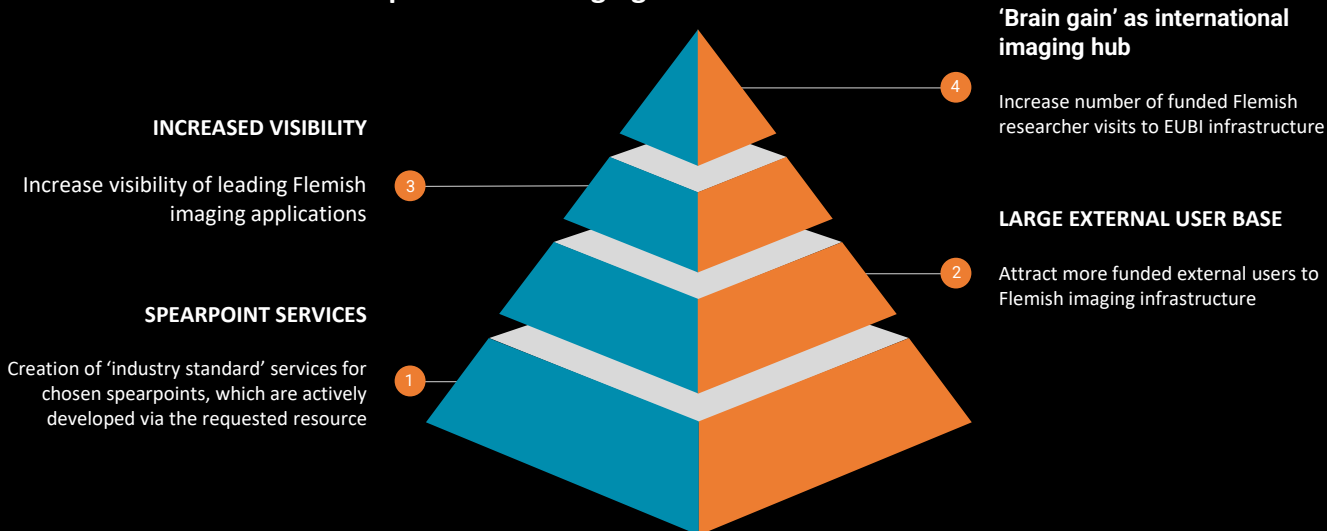
A consortium of state-of-the-art imaging facilities covering biological and biomedical imaging 'molecule to man'



Flanders BioImaging is the Belgian Node for the Euro-BioImaging ERIC



What are the benefits of Open Access Imaging?

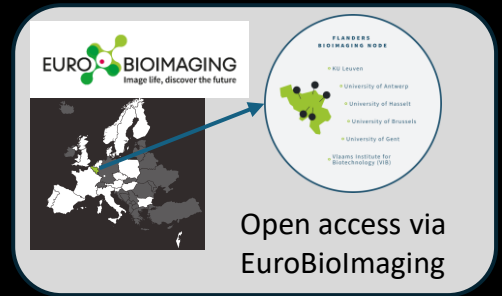




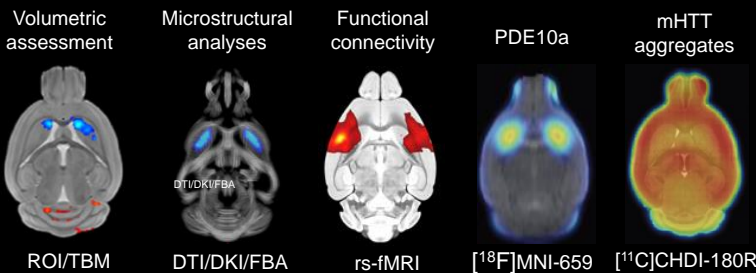
Flanders Bioimaging

We focus on providing access to **state-of-the-art imaging applications** developed at each **core facility** in the areas of **CNS disease and oncology**, at the **micro/meso/macro** scales.

- Translational Imaging Bio-markers of CNS disease
- Multimodality biomarkers for the preclinical evaluation of neurodegenerative diseases and treatment response
- Enteric nervous system imaging
- smFRET and Correlative Spectroscopy
- Correlative Light-Electron Microscopy
- Systems microscopy
- Pharmacokinetic imaging
- Multimodal imaging for radiotherapy studies
- Translation of Nanobody Theranostics



- Multimodality biomarkers for the preclinical evaluation of neurodegenerative diseases and treatment response

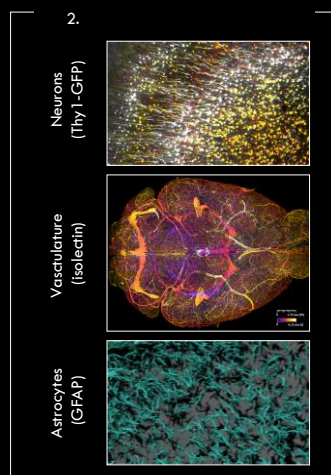
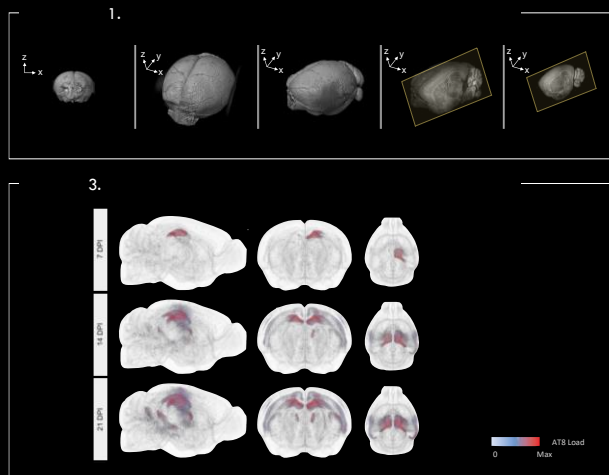


Multi-modal integration of PET/MRI biomarkers to determine
 => temporal profile of changes
 => causal relationship between changes
 => **strengthening the sensitivity of an integrated predictive biomarker**

• Systems Microscopy

Whole brain microscopy for *in toto* histopathology

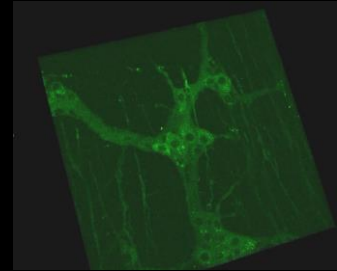
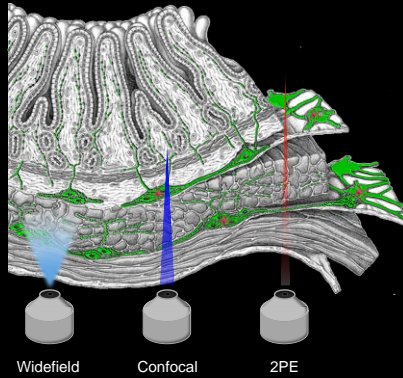
=>virtual sectioning through whole mouse brain
 =>visualizing multiple structures
 => Tau pathology staging in K18-seeded P301L mice
 => Correlation with biomedical imaging



- Enteric Nervous System Imaging

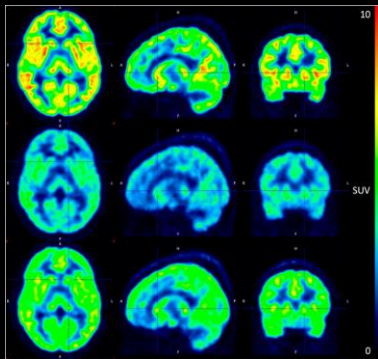
Multiphoton and Second Harmonic Imaging of the ENS

=> Measurement of cellular activity in intact three-dimensional (3D) environment
 => high spatial and temporal resolution
 => understanding integrated ENS function in disease models and in response to therapy



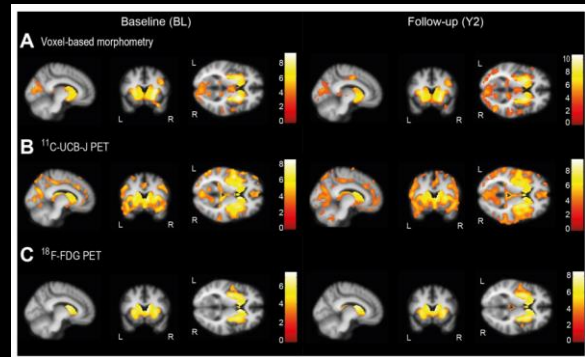
2-photon functional/structural imaging of entire thickness of the unpeeled large intestine in mouse

- Translational Imaging Bio-markers of CNS disease



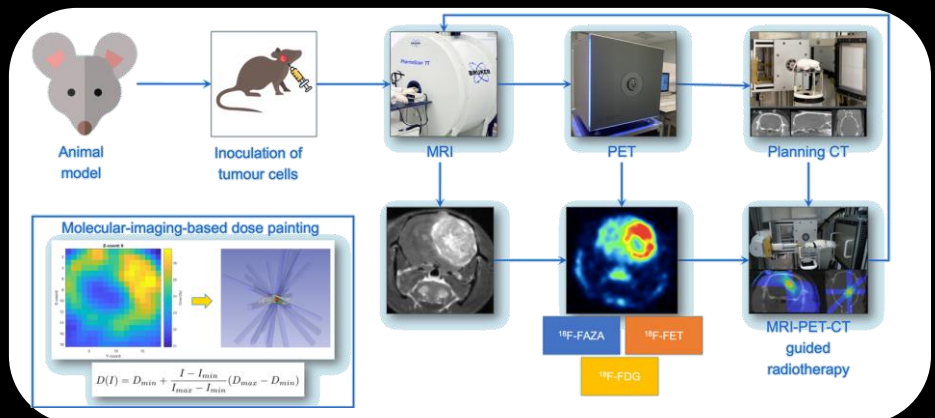
Translational platform for CNS PET probes

=> Determine receptor occupancy (e.g. [¹¹C]-UCB-J and SDI-118 therapy targeted to SV2A, left)
 => Evaluate performance as an early biomarker (e.g. [¹¹C]-UCB-J in Huntington's disease)



- Multimodal imaging for radiotherapy studies

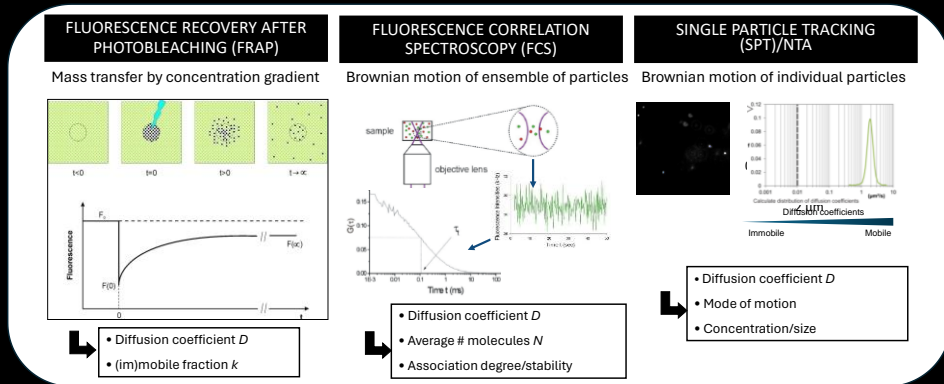
Molecular Imaging guided preclinical radiotherapy platform
 => Target heterogenous tumour regions based on molecular markers (hypoxia, glycolysis etc.)
 => Delivery of clinically relevant radiotherapy regimes and combination therapy evaluation



• Pharmacokinetic Imaging

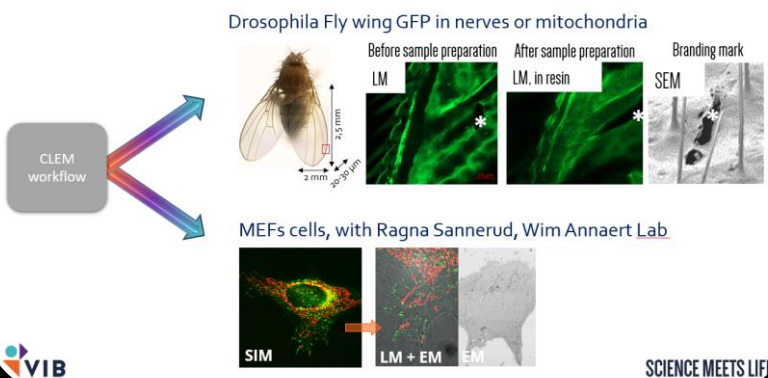
Multimodality evaluation of molecules / nanoparticles in biologically relevant substrates

- ⇒ characterize physical transport parameters
- ⇒ Evaluate stability for drug delivery and release



• Correlative Light and Electron Microscopy

The CLEM workflow applied to different types of sample



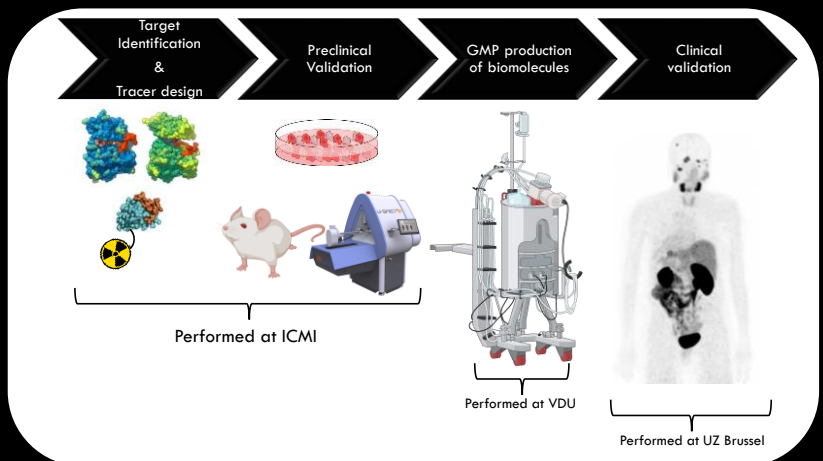
Correlative Light and Electron Microscopy in a range of samples

- ⇒ Incorporation of ultrastructural information into the physiological context provided by fluorescent reporters and light microscopy
- ⇒ CLEM workflows derived for a wide range of biological samples and organisms

• Translation of Nanobody Theranostics

Translational platform for Nanobody-based diagnostics and therapeutics

- ⇒ Full platform for Nanobody-based theranostic agent discovery and development
- ⇒ Manufacture of biomolecules to GMP
- ⇒ Clinical translation and evaluation of radiopharmaceuticals



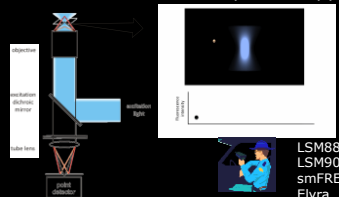
• smFRET and Correlative Spectroscopy

Dynamic Optical Microscopy I

Evaluation of biomolecular movement and interactions using Fluorescence Correlation and Raster Image Correlation Spectroscopy with applications in:

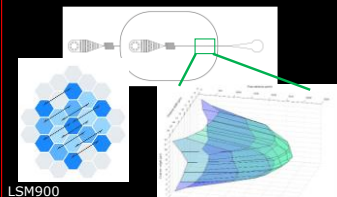
- ⇒ Advanced flow characterization
- ⇒ Asymmetric diffusion

Fluorescence correlation spectroscopy



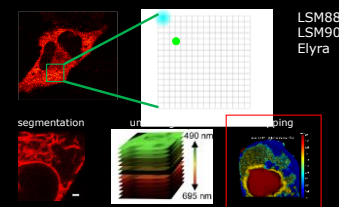
LSM880
LSM900
smFRET
Elyra

Advanced flow characterization



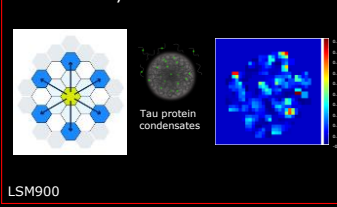
LSM900

Raster image correlation spectroscopy



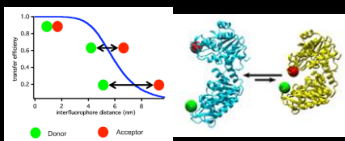
LSM880
LSM900
Elyra

Asymmetric diffusion



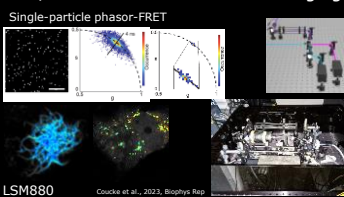
LSM900

Förster resonance energy transfer



smFRET

440/488 Fluorescence lifetime imaging



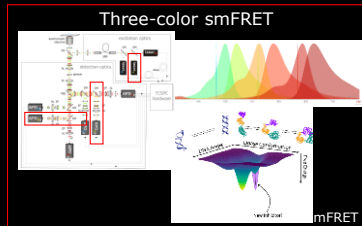
LSM880

Coucke et al., 2023, Biophys Rep

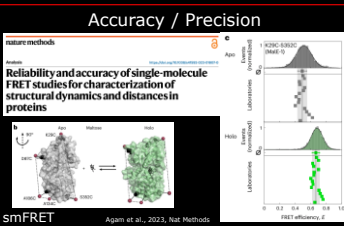
Dynamic Optical Microscopy II

Evaluation of biomolecular structural 'wobbling' using single molecule (3-color) Förster Resonance Energy Transfer with applications in:

- ⇒ Fluorescence lifetime imaging
- ⇒ Conformational status and interactions of proteins



smFRET

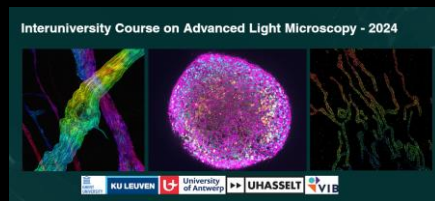
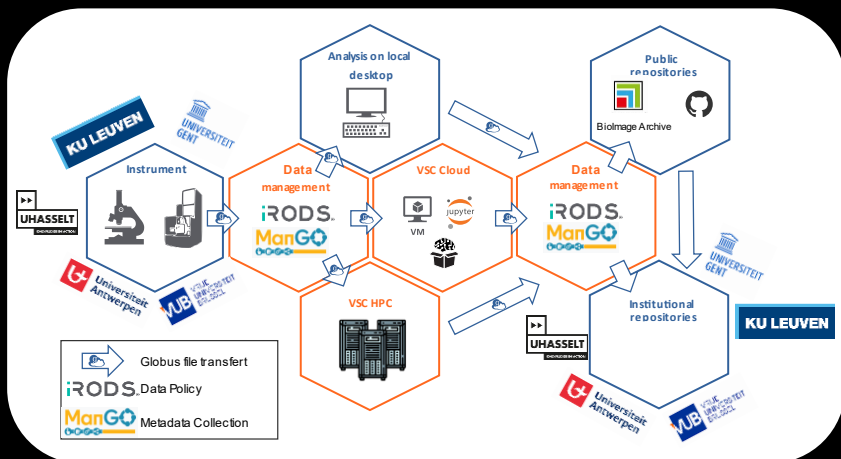


smFRET

Agam et al., 2023, Nat Methods

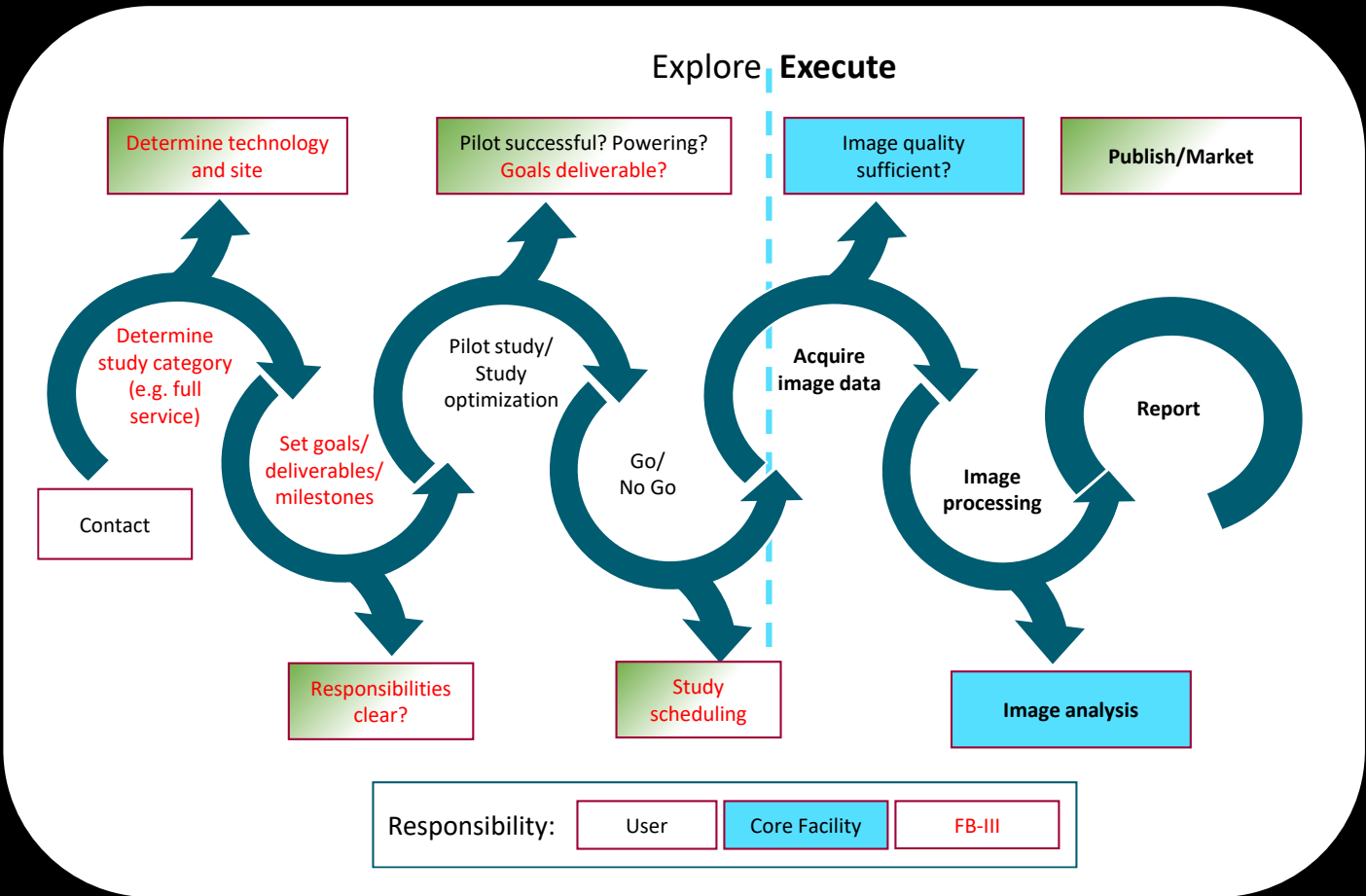
• Unified framework for image data management

• Consortia-wide training courses

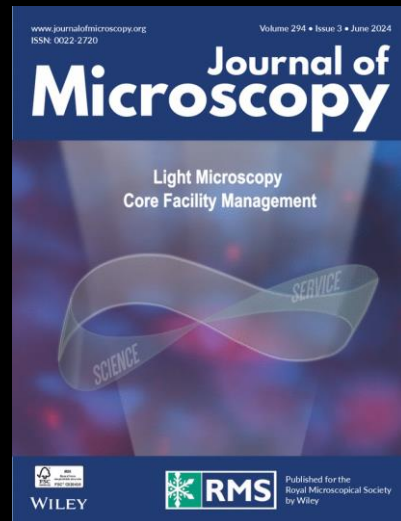




Quality management and project development framework
ensures high-quality data and efficient use of access



**Core Facility Management:
Development of the 'Good Facility
Practice' (GFP) Guidelines**





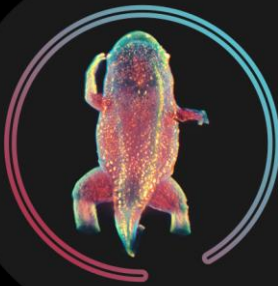
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FLANDERS BIOIMAGING NODE



- KU Leuven
- University of Antwerp
- University of Hasselt
- University of Brussels
- University of Gent
- Vlaams Institute for Biotechnology (VIB)





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