



EBRAINS

QUINT workflow and related viewers

Maja Puchades

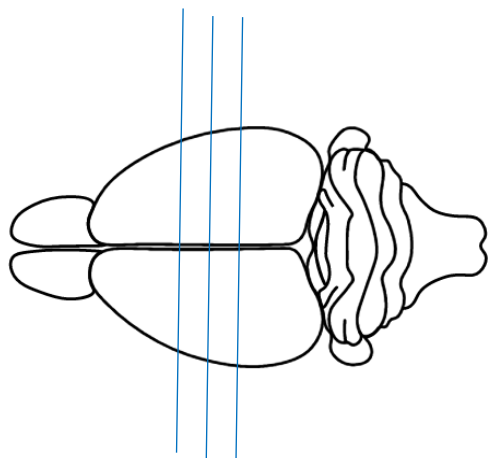
University of Oslo

EBRAINS Tools for Teaching: Leveraging EBRAINS Open Science Tools for Neuroscience Education
EBRAINS Tutorials and Users Day, 12 March 2025 | Heidelberg, Germany

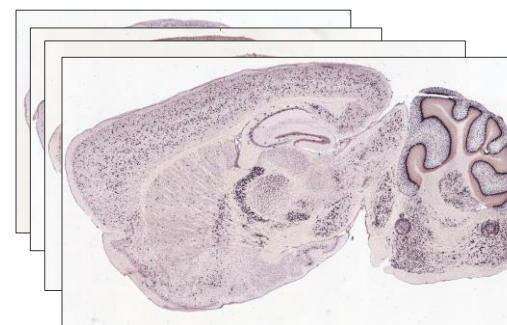


Co-funded by
the European Union

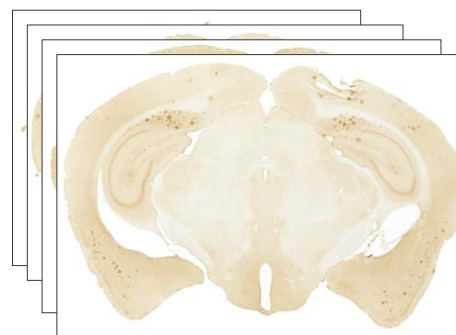
Scientific question: how to quantify features in rodent brains?



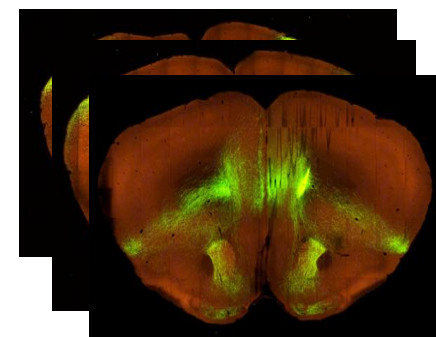
Immunohistochemistry,
in-situ hybridisation,
other staining methods



Labelled cells



Beta-amyloid
aggregates



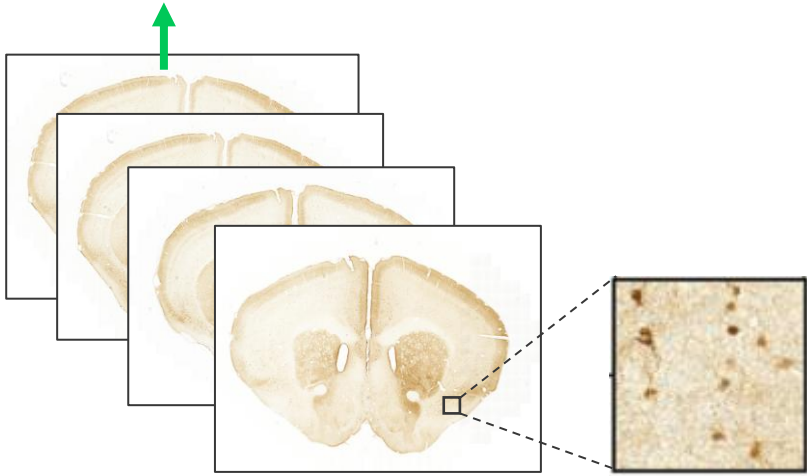
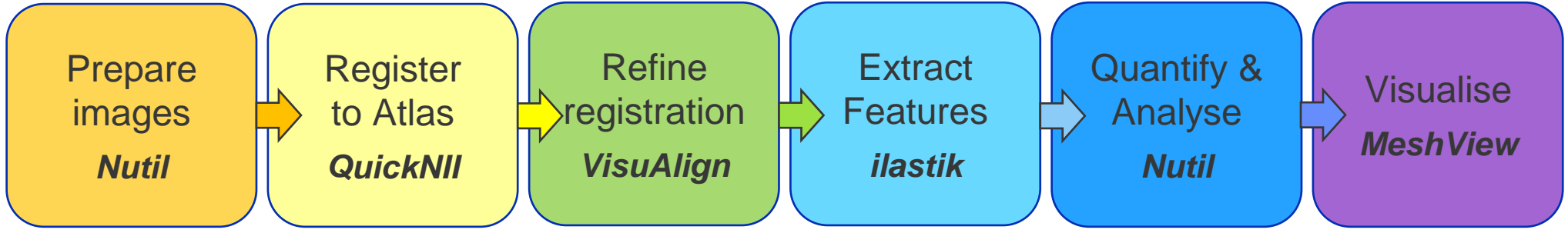
Projecting white
matter fibres

- Explore normal anatomy and connectivity
- Assess disease progression in animal models
- Quantify effects of interventions

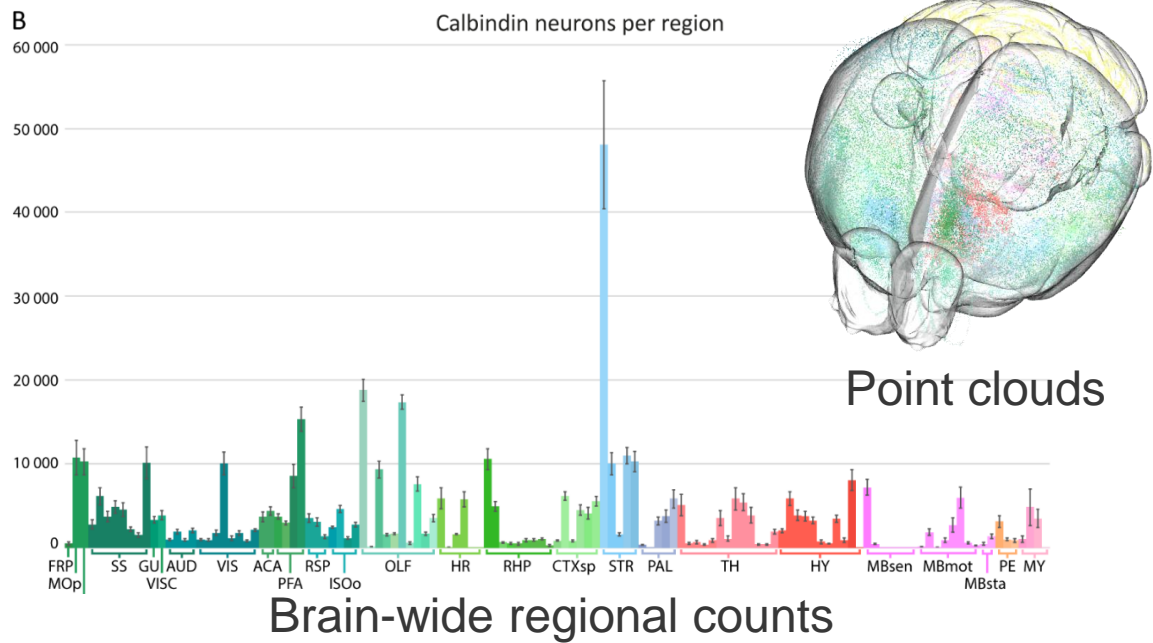
QUINT workflow for atlas-based analysis



<https://www.ebrains.eu/brain-atlases/analysis/labelled-features-analysis>

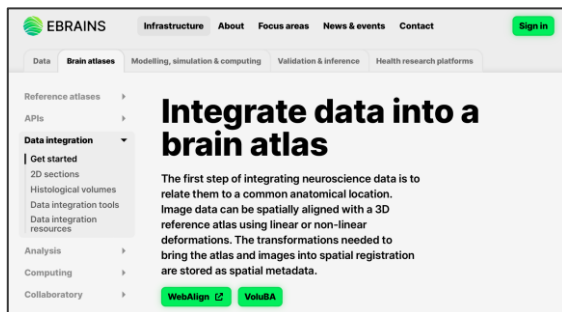


Calbindin cells in mouse brain

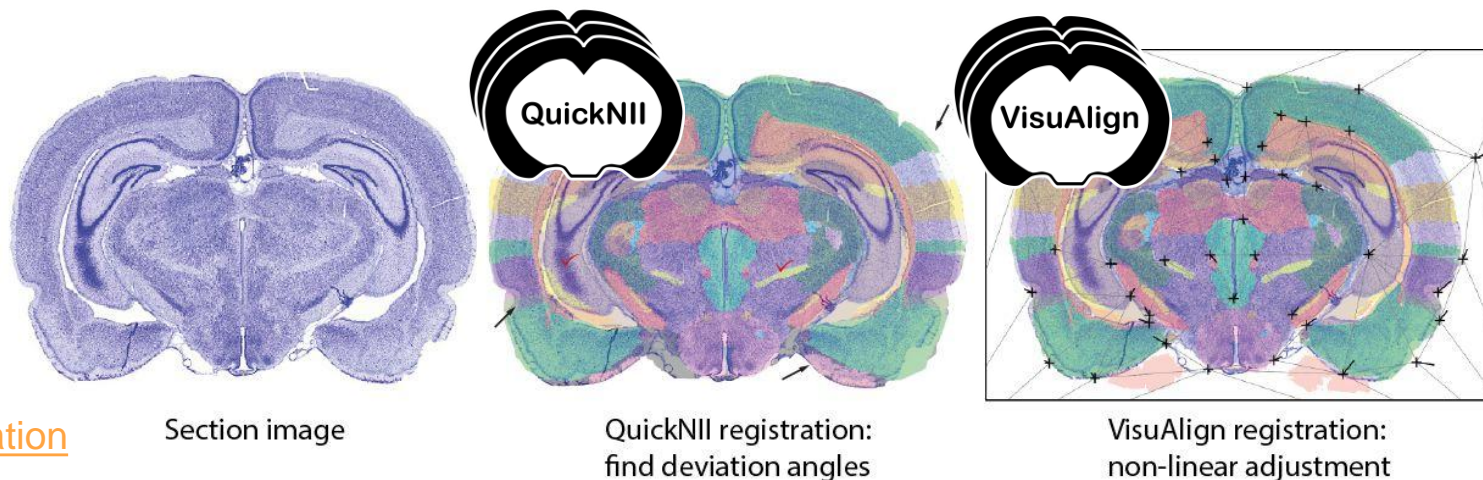


Cited in more than 80 original publications

Brain section image registration to an atlas



ebrains.eu/brain-atlases/data-integration



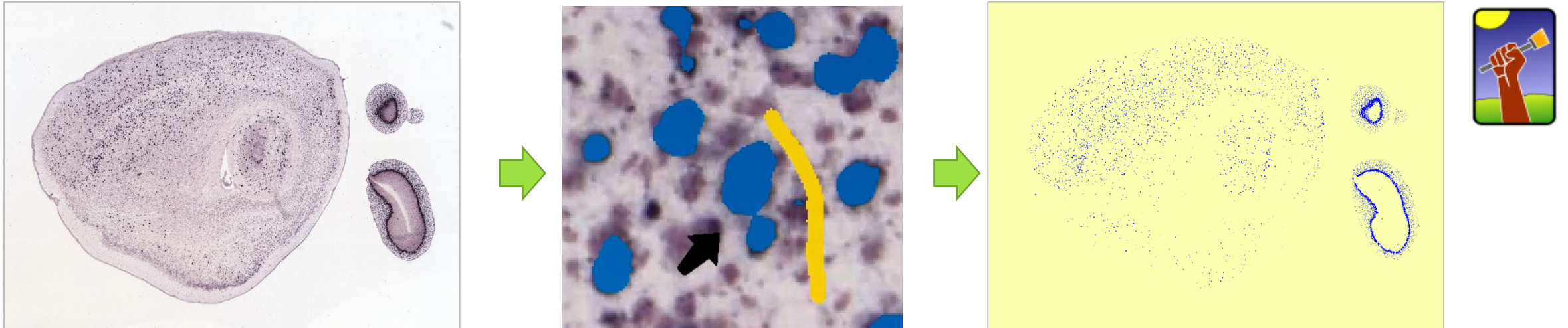
Section image

QuickNII registration:
find deviation angles

VisuAlign registration:
non-linear adjustment

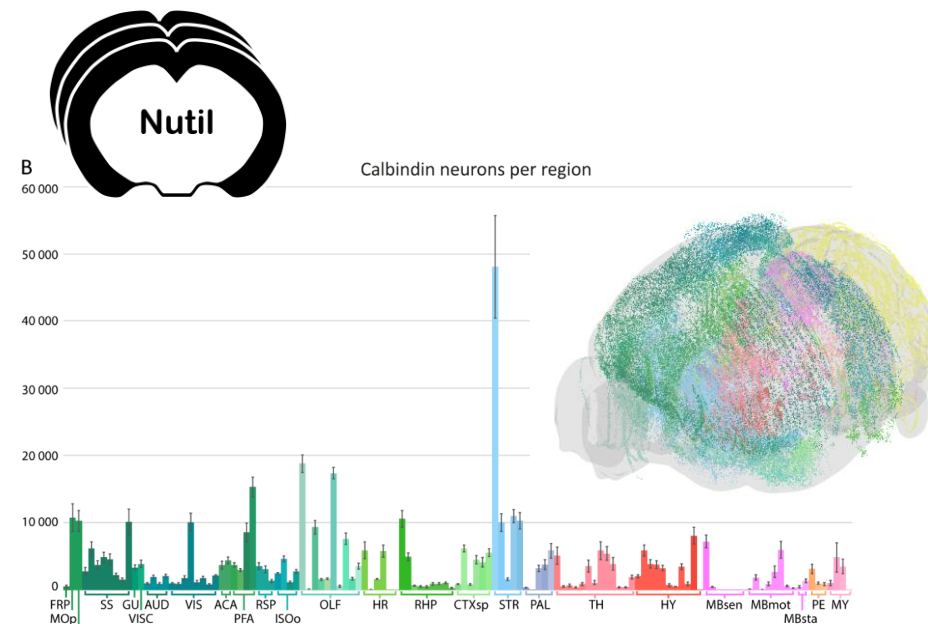
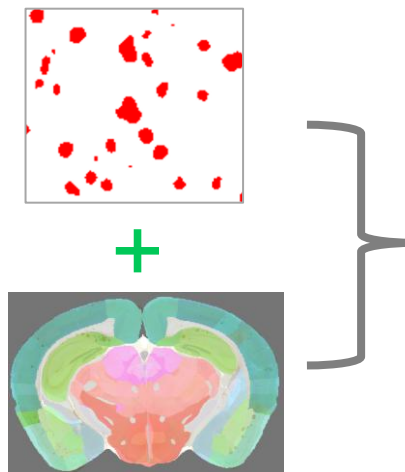
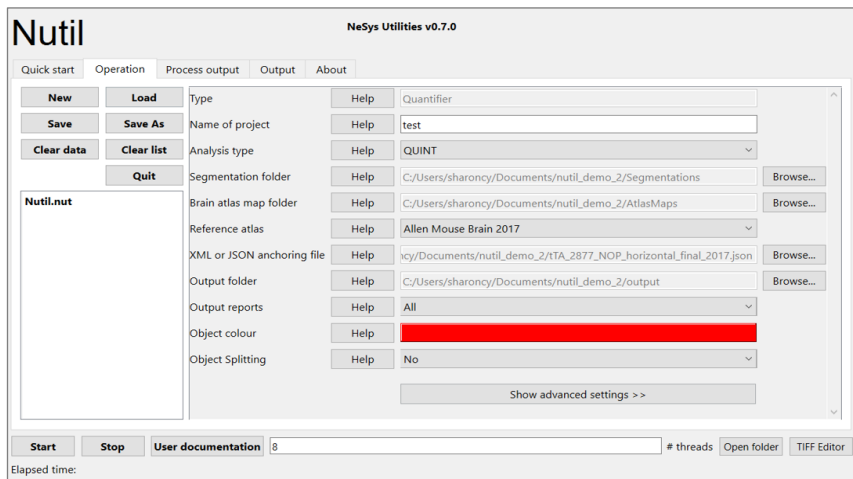
- QuickNII and VisuAlign software allow users to perform brain section registration to a reference atlas (mouse or rat).
- Course at PhD level: *Neuroscience data integration through use of digital brain atlases (University of Oslo)* and available through INCF training space.
- Requirements: easy to download and install. Works on Windows and Mac OS, does not require coding skills. Challenges: requires prepreg of data files.
- Freely available, has good user documentation and support. Will be part of a modular teaching package.

Segmentation your features of interest with ilastik



- Machine learning based object segmentation
- Course at PhD level: *Neuroscience data integration through use of digital brain atlases (University of Oslo)* and available through INCF training space.
- Requirements: Easy to download and install. Works on Windows and Mac OS, does not require coding skills. Challenges: Requires prepreg of data files and has an upper limit of image size.
- Freely available, has good user documentation.

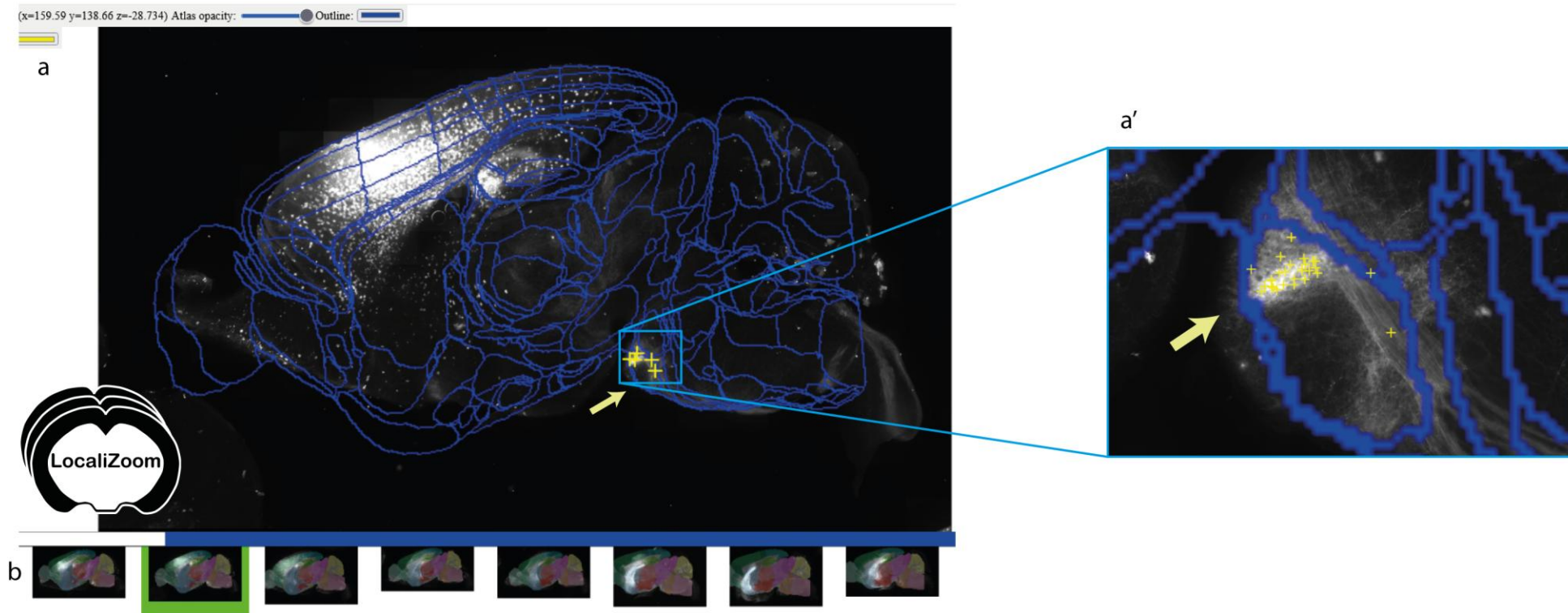
Nutil: atlas based quantification



The Nutil software is a pre- and post-processing toolbox for histological images

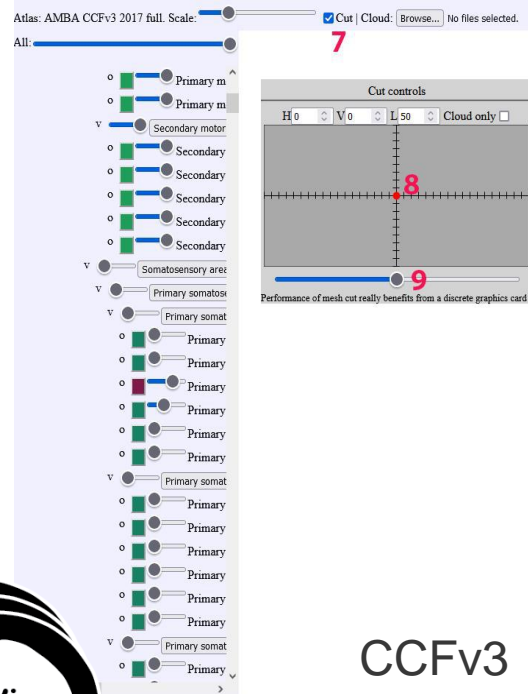
- *Transform* for image preparation (downscale, rotate, rename)
- *Quantifier* for spatial analysis
- Course at PhD level: *Neuroscience data integration through use of digital brain atlases (University of Oslo)* and available through INCF training space.
- Requirements: easy to download and install. Works on Windows. does not require coding skills. Challenges: Requires prepreg of data files and has an upper limit of image size.
- Freely available, has good user documentation and support. Will be part of a modular teaching package.

LocaliZoom

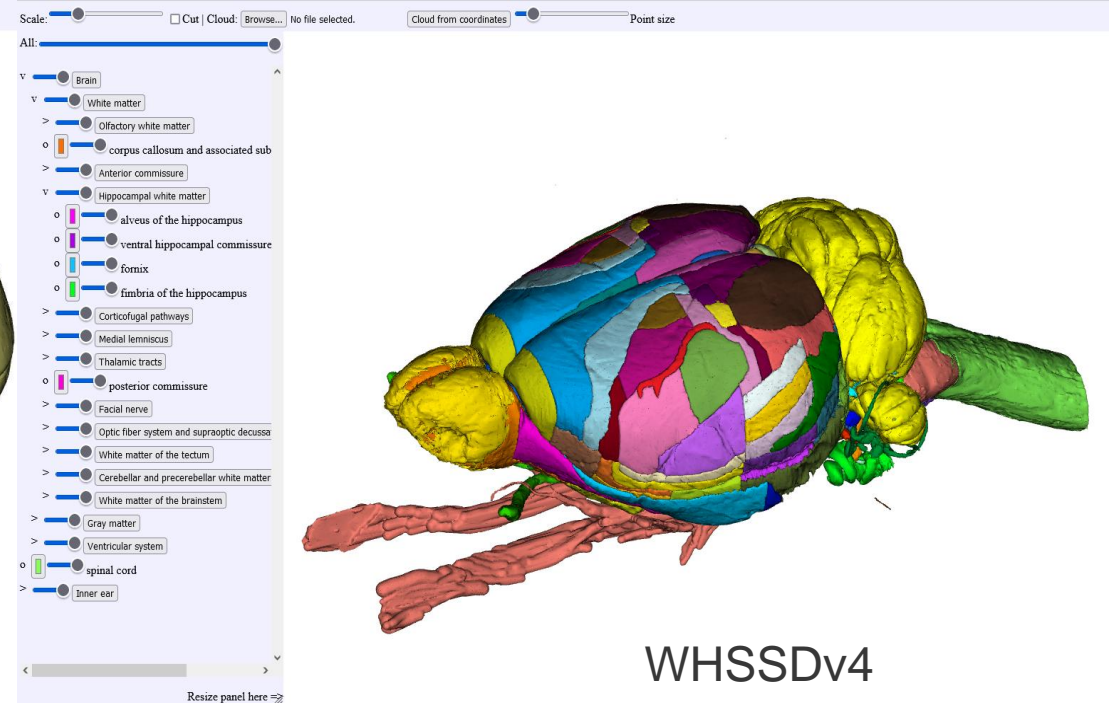
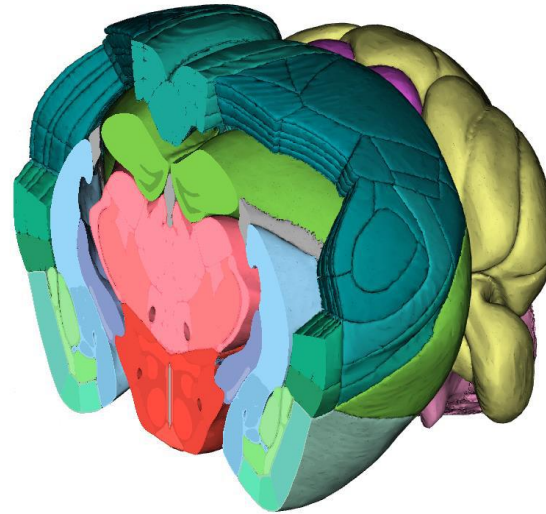


- Viewer for registered brain section images, annotation feature allow extraction of points coordinates.
- Recently available to EBRAINS users as a collaboratory app.
- Requirements: EBRAINS account
- Freely available, has good user documentation and support. Will be part of a modular teaching package.

MeshView



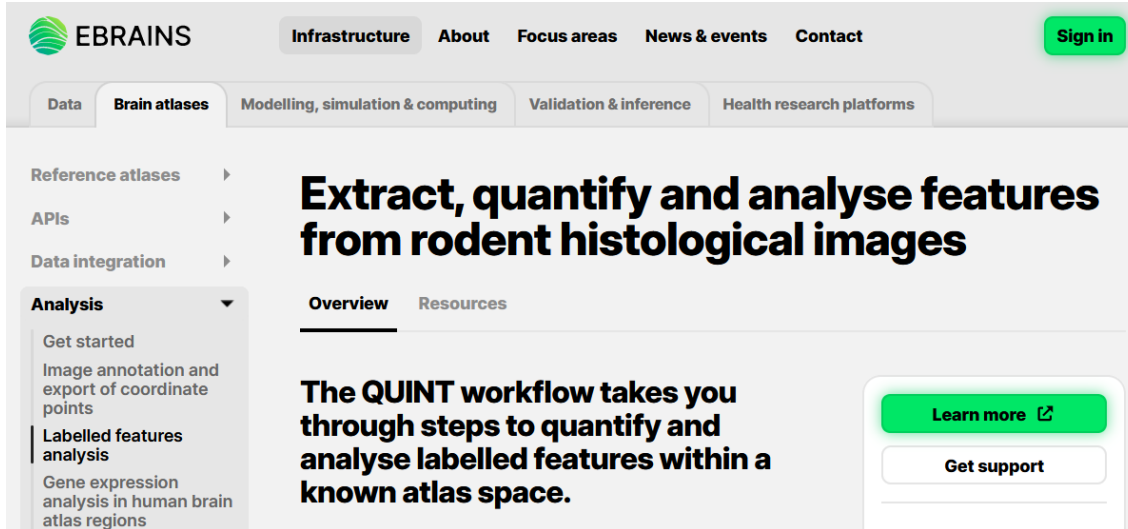
CCFv3



WHSSDv4

- Meshview can be used to learn the anatomy. Allow for visualisation of point clouds.
- Course at PhD level: *Neuroscience data integration through use of digital brain atlases (University of Oslo)* and available through INCF training space.
- Freely available (MeshView read the docs), has good user documentation and support. Will be part of a modular teaching package.

Documentation and Access



The screenshot shows the EBRAINS website with a navigation bar at the top containing links for Infrastructure, About, Focus areas, News & events, and Contact. A 'Sign in' button is on the right. Below the navigation bar, there are tabs for Data, Brain atlases, Modelling, simulation & computing, Validation & inference, and Health research platforms. The 'Brain atlases' tab is selected. On the left, there is a sidebar with categories: Reference atlases, APIs, Data integration, and Analysis. The 'Analysis' category is expanded, showing sub-items: Get started, Image annotation and export of coordinate points, Labelled features analysis, and Gene expression analysis in human brain atlas regions. The main content area features a large heading: 'Extract, quantify and analyse features from rodent histological images'. Below this, there are tabs for Overview and Resources. The Overview tab is active, displaying the text: 'The QUINT workflow takes you through steps to quantify and analyse labelled features within a known atlas space.' To the right of this text are two buttons: 'Learn more' and 'Get support'.

www.ebrains.eu



The screenshot shows the QUINT workflow documentation page. It features a large blue header with the QUINT logo, which consists of a stylized brain outline with the word 'QUINT' inside. Below the logo is a search bar labeled 'Search docs' and a dropdown menu set to 'latest'. The page has a dark sidebar on the left with a table of contents listing sections: INTRODUCTION, What is QUINT?, Cite us, Contact us, PREPARING YOUR IMAGES, File naming and size, and ATLAS-REGISTRATION. The main content area is white and contains the title 'QUINT workflow' and the section 'Introduction'.

[Home](#) / [QUINT workflow](#)

[View page source](#)

QUINT workflow

Introduction

- [What is QUINT?](#)
 - [Supported atlases](#)
 - [The QUINT workflow](#)
 - [FAQ](#)
 - [Examples of use](#)

- [Cite us](#)
 - [Cite the atlases](#)
- [Contact us](#)
 - [Acknowledgements](#)

Preparing your images

- [File naming and size](#)
 - [Naming convention](#)

<https://quint-workflow.readthedocs.io/en/latest/>

Acknowledgements

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