



# Interactive Human Brain Atlas

Forschungszentrum Juelich GmbH

 Explore & analyze human brain data in 3D from a web browser

## TECHNOLOGY DESCRIPTION

The Human Brain Project offers an interactive human brain atlas, which allows to explore 3D reference models and parcellations of the brain using only a web browser. This includes the BigBrain, a human brain model at microscopic resolution, which resolves individual cortical layers and large cells. Users can select different parcellations, navigate to specific brain regions, and interactively zoom and rotate to arbitrary viewpoints. In the sense of a spatial information system, the atlas allows to browse the comprehensive data repository of HBP for data and models related to selected brain locations, and retrieve descriptions of cytoarchitecture, connectivity, chemoarchitecture, genetics and brain function. Users can also map their own data to atlases to analyze them in context.

**Exploring the 3D structure of the human brain, down to the level of 20 microns from a web browser**

**Finding and selecting brain regions, and using them to explore the Human Brain Project's comprehensive repository of brain data and models .**

**Adding custom tools for working with brain regions, by using an open plugin architecture**

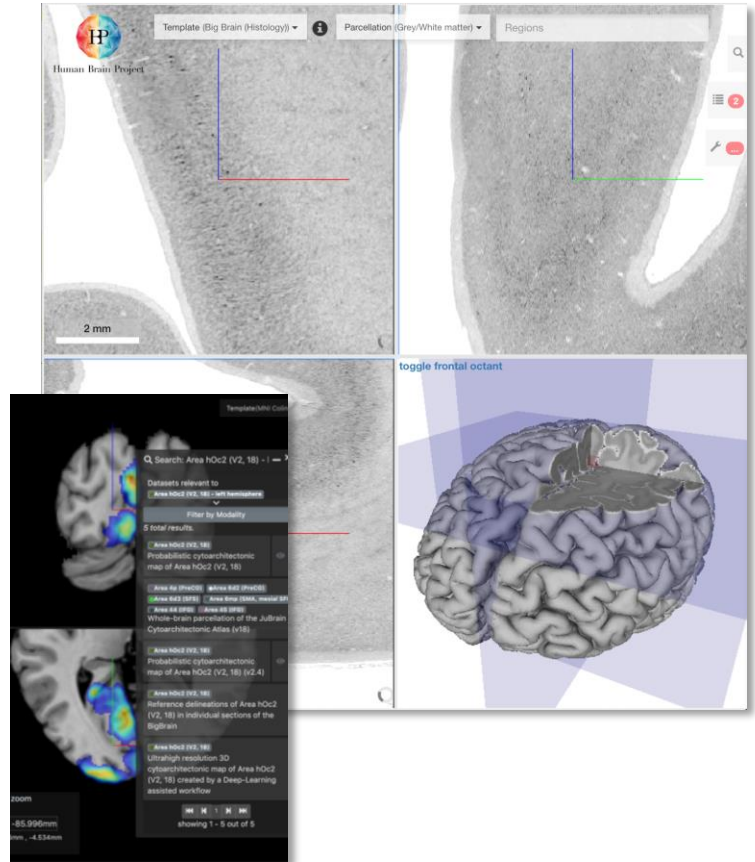
## AREAS

Brain atlases | Neuroanatomy | Data repositories | 3D visualization



## COMPETITIVE ADVANTAGES

- Efficient 3D navigation of a microscopic resolution brain atlas in a web browser
- Access to probabilistic maps that capture human brain variability, coupled with 3D maps at microscopic resolution
- Interactive access to a growing range of spatially organized multimodal brain data - **a spatial brain information system**
- Interactive functionality to project custom datasets to reference atlases for localizing and assessing neuroscientific findings
- Possibility to integrate and share custom data together with the HBP atlases



The interactive brain atlas allows instantaneous exploration of high resolution 3D brain models, as well as exploration and analysis of comprehensive neuroscience data by their location in the brain.

## TECHNOLOGY READINESS LEVEL



## REFERENCES

- Atlas used by neuroanatomists, neuroimaging researchers, clinicians, and increasingly computational neuroscientists
- Based on the neuroglancer Project (<https://github.com/google/neuroglancer>)
- Includes interactive access to the “BigBrain” (<http://bigbrain.humanbrainproject.org/>) high-resolution human brain model (Amunts/Evans et al., Science 2013)

## CONTACT

Timo Dickscheid  
 Forschungszentrum Juelich | Germany  
 t.dickscheid@fz-juelich.de

## APPLICATION & MARKET POTENTIAL

- **Education:** Explore the anatomy of the brain in 3D, and learn more about different brain areas
- **Medical applications:** Localize brain areas affected by clinical findings
- **Neuroimaging:** Use different reference atlases to aggregate and assess results from neuroimaging studies
- **Simulation:** Retrieve region-specific multimodal properties of the brain to construct simulation models