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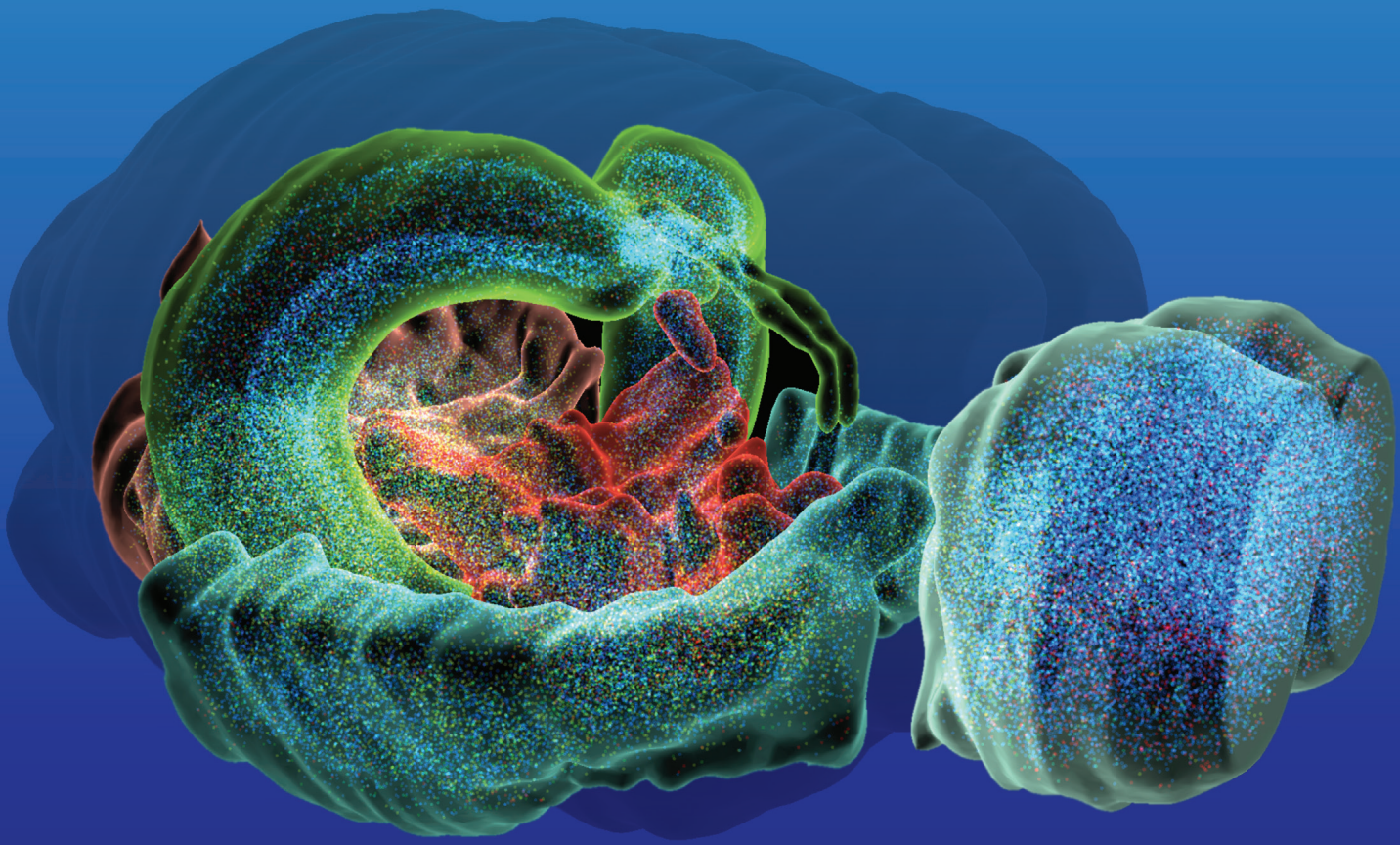


Blue Brain
Cell Atlas

A comprehensive online resource that provides the number, types, and positions of cells in all areas of the mouse brain

The Blue Brain Cell Atlas is the first digital 3D cell atlas of the whole mouse brain. It provides neuroscientists with a unique insight into the cellular composition of the mouse brain. Users can view and download the number, major types and 3D positions of all neurons and glia in all 737 areas of the mouse brain.

The Blue Brain Cell Atlas provides the densities and positions of all excitatory, inhibitory and neuromodulatory neurons, as well as astrocytes, oligodendrocytes and microglia in each of the brain regions defined in the Allen Mouse Brain Atlas - mouse.brain-map.org

Blue Brain's Cell Atlas was constructed by placing cells computed from whole brain Nissl and gene expression stains from the Allen Institute for Brain Science. Gene expression stains were used to decide the major type of cell. The API provided by the Allen Mouse Brain Atlas was used to access the data. Cell numbers and tissue distributions were validated against values from the literature where available. We found that the literature only contains specific values for 4% of the 737 brain regions. The atlas fills the gap of cell numbers for 96% of brain regions.

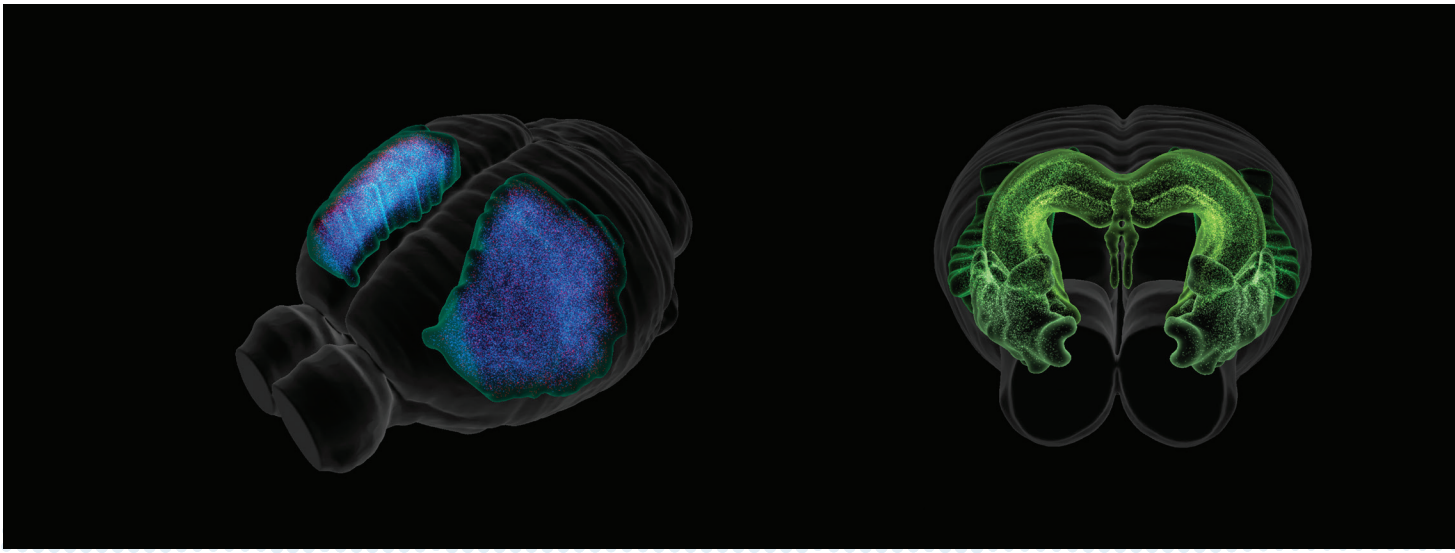
Blue Brain found that experimental data cannot provide ground truth-values and therefore we developed a dynamic cell atlas that can integrate diverse datasets to converge towards ground truth-values, in principle for every cell-type in all brain regions. More detailed classification of cell-types can therefore be included and estimates for these can be iteratively improved, as new data is integrated. The user can also submit region and cell type specific densities and numbers obtained in new experiments for comparison and, to help with the convergence towards the ground truth. New data will be used to further improve both the next iteration of the Cell Atlas and its validation.

"Despite decades of staining the mouse brain and building atlases of stained cells, we lacked the basics of how many neurons there are in each brain region. The Blue Brain Cell Atlas solves this problem and provides the best estimates for all regions of the entire mouse brain."

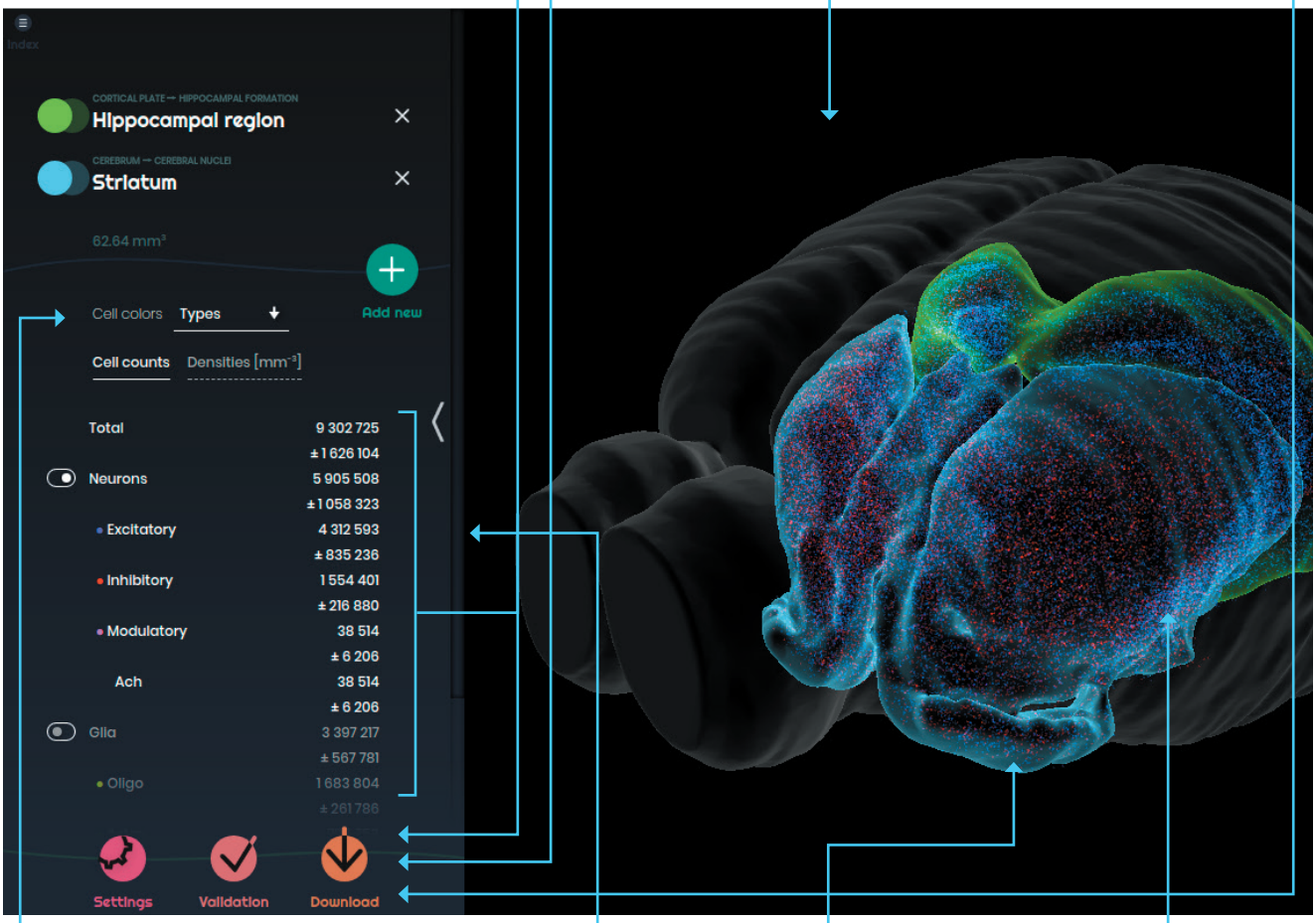
Prof. Henry Markram
Founder and Director, Blue Brain Project

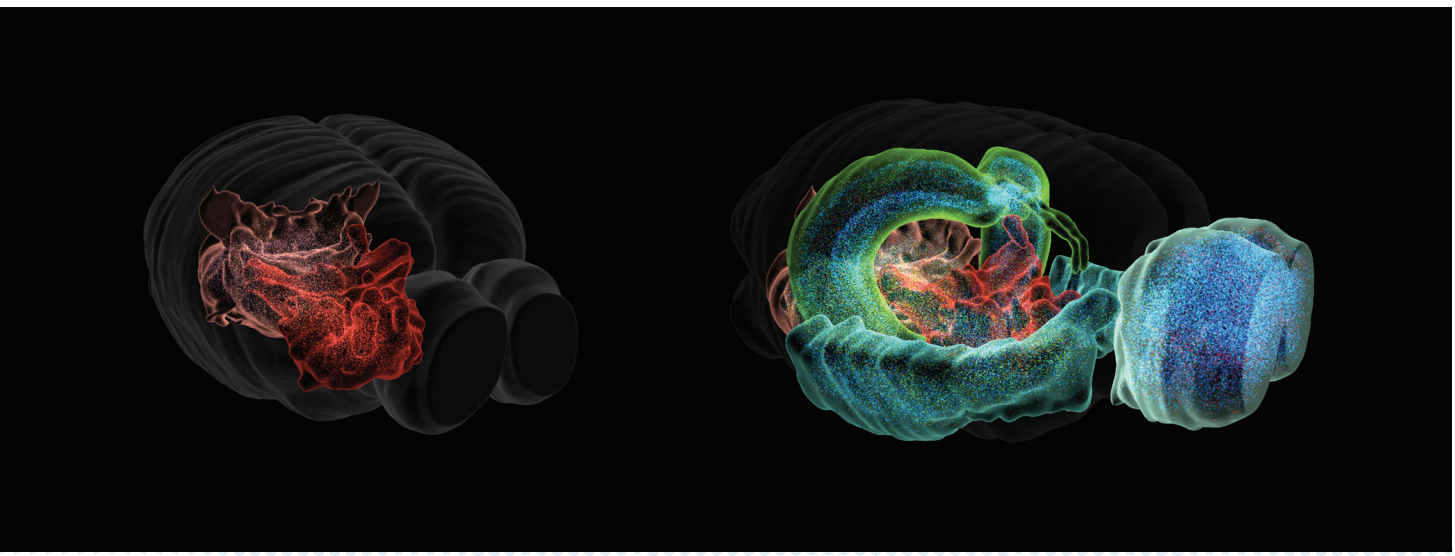
"Functional circuits can now be built directly from the Blue Brain Cell Atlas, enabling unprecedented scale and resolution of simulation."

Daniel Keller
Group Leader, Molecular Systems, Blue Brain Project



Explore the cellular composition of selected brain areas





About EPFL's **Blue Brain Project**

The aim of the EPFL Blue Brain Project, a Swiss brain research initiative founded and directed by Professor Henry Markram, is to establish simulation neuroscience as a complementary approach alongside experimental, theoretical and clinical neuroscience to understanding the brain, by building the world's first biologically detailed digital reconstructions and simulations of the mouse brain.

The **Blue Brain Cell Atlas** is publicly available at:
bbp.epfl.ch/nexus/cell-atlas

Blue Brain would like to thank the Allen Institute for Brain Science (alleninstitute.org/what-we-do/brain-science/) for the large array of publicly available data at: mouse.brain-map.org

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For more information on the Blue Brain Cell Atlas, please contact:

Dimitri Rodarie
Scientist
Blue Brain Project
dimitri.rodarie@epfl.ch

bbp.epfl.ch/nexus/cell-atlas **portal.bluebrain.epfl.ch** **epfl.ch/research/domains/bluebrain**

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