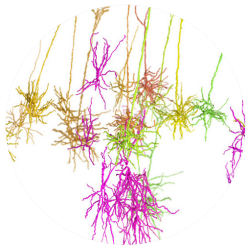
PUBLIC RESOURCES

ALLEN INSTITUTE *for* BRAIN SCIENCE

The Allen Institute for Brain Science provides a variety of unique online public resources that give users a powerful way to search and view extensive gene expression data, neural connections, single cell characterization and neuroanatomy – all openly accessible via the Allen Brain Atlas data portal at brain-map.org.

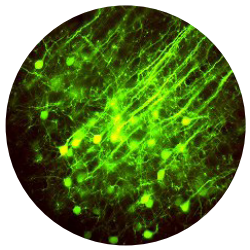
ALLEN CELL TYPES DATABASE

The Allen Cell Types Database is our first step in characterizing the cellular components of the brain. The database is a multi-modal characterization of cells from the adult mouse visual cortex based on their functional and structural characteristics. Users can investigate the brain's cell types using electrophysiological and morphological data from single cells, and accompanying models of cellular behavior. Key features include whole-cell patch clamp recordings from targeted cells, images of biocytin-filled neurons, full 3D digital reconstructions of a subset of cells, and GLIF and biophysical models that can be downloaded via the Allen SDK. Future data releases will include gene expression profiles of single cells as well as single cell data from human cortex.



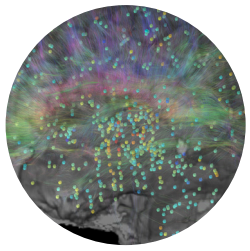
ALLEN MOUSE BRAIN CONNECTIVITY ATLAS

The Allen Mouse Brain Connectivity Atlas is a high-resolution map of neural connections in the mouse brain. Built on an array of transgenic mice genetically engineered to target specific cell classes, the atlas comprises a unique compendium of projections from selected neuronal populations throughout the brain. Key features include projection mapping image data captured using serial two-photon tomography, transgenic characterization data detailing expression in Cre and other driver lines, image data comparing viral and conventional tracing methods and anatomic reference data. The data is presented within the interactive Brain Explorer® 3D viewer and can be searched by anatomical region, injection site or axonal trajectories, as well as a "virtual" retrograde search.



ALLEN HUMAN BRAIN ATLAS

The Allen Human Brain Atlas is a unique multi-modal atlas that maps gene expression across the human brain. Integrating anatomic and genomic information, available data modalities include magnetic resonance imaging (MRI), diffusion tensor imaging (DTI), histology, and gene expression data derived from both microarray and in situ hybridization (ISH) approaches. Key features include an "all genes, all structures" microarray survey spatially mapped to the MRI, ISH cellular resolution image data for selected genes in specific brain regions, and an annotated human brain atlas guide. Anatomic and gene-based search options are available, as well as interactive viewing with the Brain Explorer 3D software.



BRAINSPAN ATLAS OF THE DEVELOPING HUMAN BRAIN

The BrainSpan Atlas is a unique resource for studying human brain development. The atlas provides a broad and detailed anatomical analysis of gene expression across human brain development, comprising in situ hybridization, RNA-sequencing and microarray approaches, along with supporting neuroanatomical reference content. The atlas was developed by a consortium of scientific partners from multiple organizations and was funded by awards from the National Institute of Mental Health. This resource is directly accessible at developinghumanbrain.org.

PUBLIC RESOURCES

ALLEN BRAIN ATLAS API

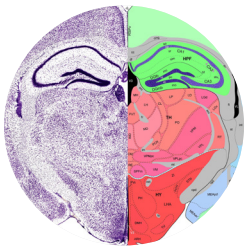
The Allen Brain Atlas API provides the computational neuroscience community with under-the-hood programmatic access to the Allen Institute's vast datasets using a REST-based approach. The API contains methods to access high-resolution images, 3D expression summaries, primary microarray and RNA-sequencing results, and MRI and DTI files from across the Institute's suite of atlas resources.

ALLEN SDK

The Allen Software Development Kit (SDK) contains a set of software libraries that interacts with the API and enable users to easily read and analyze our suite of data. In the initial release, the Allen SDK focused primarily on the newly released Allen Cell Types Database, including source code for downloading and running simulations of Generalized LIF and perisomatic biophysical neuronal models.

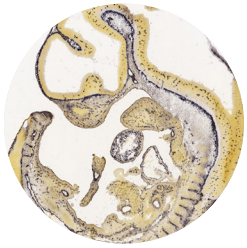
ALLEN MOUSE BRAIN ATLAS

The Allen Mouse Brain Atlas, the first Allen Brain Atlas resource, is a genome-wide, three-dimensional map of gene expression throughout the adult mouse brain. Similar in scale to the Human Genome Project, the atlas comprises cellular resolution *in situ* hybridization images with comprehensive anatomic coverage that reveal where each gene is expressed in the brain, as well as an integrated suite of powerful data search and visualization tools, including Correlative Search, AGEA and an anatomic reference atlas.



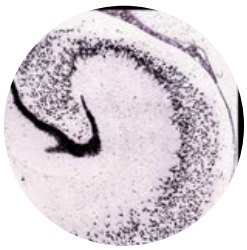
ALLEN DEVELOPING MOUSE BRAIN ATLAS

The Allen Developing Mouse Brain Atlas is a detailed map of how genes change during the development of the brain. The atlas provides a framework to explore both when and where genes are activated in the mouse brain from embryo through old age. Informatics data processing enables both spatial search and temporal search. Anatomic and temporal search locates enhanced gene expression in large structures, while manual data annotation allows for search of enhanced gene expression in small structures. Developmental reference atlases provide an additional framework for the data.



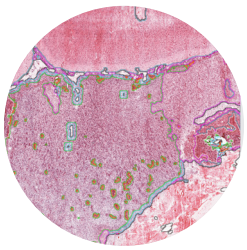
NIH BLUEPRINT NON-HUMAN PRIMATE (NHP) ATLAS

The National Institutes of Health Blueprint for Neuroscience Research awarded a contract to the Allen Institute for Brain Science, in partnership with researchers at the University of California at Davis, to generate an atlas of gene expression in the developing rhesus macaque brain. This atlas creates a developmental neuroanatomical framework for exploring the cellular and molecular architecture of the developing postnatal primate brain with direct relevance for human brain development. This resource is accessible via the Allen Brain Atlas portal or directly at blueprintnhpatlas.org.



IVY GLIOBLASTOMA ATLAS PROJECT

The Ivy Glioblastoma Atlas Project (Ivy GAP) is a unique platform for exploring the anatomic and genetic basis of glioblastoma at the cellular and molecular levels. Data available via the Allen Brain Atlas data portal include cellular resolution *in situ* hybridization data mapping gene expression across the anatomic structures inherent in glioblastoma, genome-wide RNAseq profiling for anatomical structures identified in the ISH survey, as well as associated histological data suitable for neuropathological examination. A companion database, available at ivygap.org, linked by de-identified tumor specimen numbers and developed by project partners at the Ben and Catherine Ivy Center for Advanced Brain Tumor Treatment, provides additional clinical and genomic data. This project was made possible through the support of the Ben and Catherine Ivy Foundation.



ABOUT THE ALLEN INSTITUTE The Allen Institute for Brain Science is an independent, 501(c)(3) nonprofit medical research organization dedicated to accelerating the understanding of how the human brain works in health and disease. Using a team science approach, the Allen Institute generates free public resources, drives technological and analytical advances, and discovers fundamental brain properties through integration of experiments, modeling and theory. Launched in 2003 with a seed contribution from founder and philanthropist Paul G. Allen, the Allen Institute is supported by a diversity of government, foundation and private funds. The Allen Institute practices an open science model and makes all data and tools publicly available online at brain-map.org.