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ALLEN INSTITUTE RELEASES DATA FROM 30,000 BRAIN CELLS IN ACTION

Data release also includes new information on brain cell types, as well as a new design for the data portal and new resource for computational modeling

SEATTLE, WASH. — **Oct. 11, 2018** — The Allen Institute for Brain Science, a division of the Allen Institute, today announced new data aimed at helping researchers understand the various types of cells in the brain and how cells compute visual information. Joining these new data is a software toolkit for building models of the neuronal networks making up the brain more easily and more reproducibly. Scientists around the world can find these resources at the newly redesigned Allen Brain Atlas portal and use them to study basic questions about brain structure and function, as well as brain diseases and disorders.

Observing the mind in real-time

New data in the Allen Brain Observatory captures the activity of nearly 30,000 mouse brain cells in the visual cortex, the part of the brain that processes visual information. The release nearly doubles the number of cells observed to date, bringing the total to more than 63,000 brain cells from 13 different types of excitatory and inhibitory nerve cells. Allen Institute researchers have looked across six different regions of the mouse visual cortex, and the dataset now also includes cells in the deepest layers of the mouse visual cortex.

Taken together, the Allen Brain Observatory data gives researchers the opportunity to explore how the brain functions at a comprehensive level, said Saskia de Vries, Ph.D., Assistant Investigator at the Allen Institute for Brain Science.

"What's great about the dataset is that it isn't just one experiment or five populations of cells, it's hundreds of different populations of cells. You can test a theory about how the cortex works across different populations, and you can test it exhaustively," she said. "That's the real value of the dataset and why we hope it will be valuable to the scientific community, because we're not the only ones who have theories about the visual cortex."

New brain cell types data

The Allen Cell Types Database team also added data from more than 30,000 different brain cells. This resource now contains data capturing which genes in an individual cell are turned on or off from a total of more than 33,000 human brain cells and more than 44,000 mouse brain cells. These data are a central part of an ongoing effort to create a "periodic table" of brain cell types, allowing researchers to understand the brain by better understanding its fundamental building blocks — the cells.

A toolkit for computation

The Brain Modeling Toolkit is a software suite that will allow computational neuroscientists to build models of the brain at different levels of granularity more easily and more reproducibly, said Anton Arkhipov, Ph.D., Associate Investigator at the Allen Institute for Brain Science. The toolkit is built in Python, an open-source programming language, and freely available on GitHub. The team's hope with the toolkit was that it would bring

the power of computational modeling to more researchers who want to use it but don't have extensive experience in all the available modeling tools. The toolkit can do some of that work for them, said Arkhipov.

"It's all about being able to take advantage of the existing wonderful tools without becoming an expert," he said. "The toolkit is like the steering wheel that lets you go where you need to go."

Portal redesign
The redesign of brain-map.org came about organically, said Amy Bernard, Ph.D., Product Architect at the Allen Institute for Brain Science. Bernard and her colleagues responded to feedback from users of the site that certain datasets could be made more accessible and easier to use.

"Our redesign was based on feedback from the community and we've aimed to make the site more navigable, more usable and more accessible," Bernard said. "We hope the new portal better showcases the diversity of the data we have available."

For now, the portal homepage features a new user-friendly design; all brain atlases and other datasets are accessible from the homepage. In coming months, users can expect additional features to roll out on the website.

About the Allen Institute for Brain Science
The Allen Institute for Brain Science is a division of the Allen Institute (alleninstitute.org), an independent, 501(c)(3) nonprofit medical research organization, and is dedicated to accelerating the understanding of how the human brain works in health and disease. Using a big science approach, the Allen Institute generates useful public resources used by researchers and organizations around the globe, 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 to enable its projects. The Allen Institute for Brain Science's data and tools are publicly available online at brain-map.org.

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