

THE HUMAN PROTEIN ATLAS

A new Brain Atlas launched to allow the exploration of proteins in the different regions of the brain

[September 5, 2019] - Today, as part of the Human Protein Atlas program, a new Brain Atlas is launched showing for the first time an integrated view of the proteins located to the different regions of the human, mouse and pig brain. The regional expression in these three mammalian brains have been profiled and the analysis includes 1,710 human brain samples, 119 pig brain samples and 67 mouse brain samples. The new database provides many insights of biological relevance for human brain biology and disease.

The new open access Brain Atlas allows for exploration and comparison of the expression of individual protein-coding genes. Genes with regionally elevated expression in the brain of human, pig and mouse have been identified and many of these genes have not been previously described in neural cells. Many key genes are differentially expressed between the three species, and this calls for caution when results from animal models are translated into research on the human brain. In addition, many of the regionally elevated genes are not brain elevated from a whole-body perspective, and many of the previously identified “signature genes” for brain specific cell types are here shown to have higher expression in certain peripheral tissues.

The program is a collaboration between researchers in Scandinavia and China with the basis at the Department of Neuroscience, Karolinska Institutet, the Science for Life Laboratory, Stockholm, Sweden and the BGI research institute in Shenzhen, China. All the data are integrated in an interactive, open access Brain Atlas as part of the Human Protein Atlas (www.proteinatlas.org/brain) that allows for genome-wide exploration of the protein-coding genes expressed across mammalian brain regions and all major tissues and organs. The new open access Brain Atlas database allows interactive search functions and summarize the gene expression in multiple brain regions. The integration and combinations of multiple datasets into one portal will function as a valuable tool for researchers interested in gene expression patterns and levels in the brain. “The Human Protein Atlas has many hundred thousands of visitors every month and we are excited that we can now provide a more deep description of the genes active in the different parts of the brain” says Mathias Uhlén, Director of the Human Protein Atlas program. The work was funded by the Knut and Alice Wallenberg Foundation and the Erling Persson Foundation.

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About

Human Protein Atlas

The Human Protein Atlas (HPA) is a program based at SciLifeLab (Science for Life Laboratory), Stockholm, that started in 2003 with the aim to map of all the human proteins in cells, tissues and organs using integration of various omics technologies, including antibody-based imaging, mass spectrometry-based proteomics, transcriptomics and systems biology. All the data in the knowledge resource is open access to allow scientists both in academia and industry to freely access the data for exploration of the human proteome. Version 19 (launched September 5, 2019) consists of six separate parts, each focusing on a particular aspect of analysis of the human proteins; including the Tissue Atlas showing the distribution of the proteins across all major tissues and organs in the human body, the Cell Atlas showing the subcellular localization of proteins in single cells, and the Pathology Atlas showing the impact of protein levels for survival of patients with cancer. Version 19 adds three new parts to the resource: the Blood Atlas showing the profiles of blood cells and proteins in the blood; the Brain Atlas showing the distribution of proteins in human, mouse and pig brain; and the Metabolic Atlas showing the presence of metabolic pathways across human tissues. The latter is a collaboration with Chalmers University. The Human Protein Atlas program has already contributed to several thousands of publications in the field of human biology and disease and it has been selected by the organization ELIXIR (www.elixir-europe.org) as a European core resource due to its fundamental importance for the wider life science community. The HPA consortium is funded by the Knut and Alice Wallenberg Foundation.

For more information, see: www.proteinatlas.org

Knut and Alice Wallenberg Foundation

The Knut and Alice Wallenberg Foundation is the largest private financier of research in Sweden and also one of Europe's largest. The Foundation's aim is to benefit Sweden by supporting basic research and education, mainly in medicine, technology, and the natural sciences. The Foundation can also initiate grants to strategic projects and scholarship programs.

For more information, see: <https://kaw.wallenberg.org/en>

SciLifeLab (Science for Life Laboratory)

SciLifeLab is an institution for the advancement of molecular biosciences in Sweden. SciLifeLab started out in 2010 as a joint effort between four universities: Karolinska Institutet, KTH Royal Institute of Technology, Stockholm University and Uppsala University. The center provides access for advance infrastructure in life science for thousands of researchers creating a unique environment for health and environmental research at the highest level.

For more information, see: www.scilifelab.se