

THE HUMAN PROTEIN ATLAS

[June 19, 2023]. The Human Protein Atlas consortium has today launched the version 23 of the open access knowledge resource covering human protein profiles in cells, tissues, organs and blood (www.proteinatlas.org). A new Interaction section is introduced containing data for human protein-protein interaction networks that adds new aspects in terms of protein function. In addition, all five million web pages in the resource have been updated based on a new genome assembly (Ensembl v109), thus reflecting the new consensus genome containing 20,162 protein-coding genes.

The new Interaction section presents protein-protein interaction networks for more than 11,000 genes together with metabolic maps for close to 3,000 genes. The networks presented are extendable and interactive and can be integrated with other Human Protein Atlas data to highlight protein network members according to custom made filters or pre-selected features such as subcellular location or tissue specificity.

The revised Tissue section of the Atlas has been extended with immunofluorescent-based multiplex bioimages to map 742 proteins in testis and kidney to specific cell types and cell states using co-expression analysis. The Tissue section contains immunohistochemistry-based protein expression profiles for 44 normal tissues for >80% of the human genes, integrated with mRNA expression data from 54 tissues derived from deep sequencing of mRNA.

The Brain section now has protein expression data from over 200 micro dissected human brain regions and this data has been used to cluster proteins according to their expression across different brain regions. The clustering of 17,832 genes expressed in brain tissues resulted in 56 expression clusters, which have been manually annotated. This new tool provides an overview of proteins with similar distribution, function and specificity in the human brain.

A large amount of data has also been added to the other sections. This includes the integration of HPA data with 3-D structures from the AI-based AlfaFold2 program. In addition, the Cell Line section now feature data from a total of 1,206 cell lines, including an expansion of 151 cell lines not previously described.

"We are excited to launch this new version of the open access Human Protein Atlas with an updated genome assembly and a new section for protein-protein interactions. We are confident that this will add valuable information for researchers interested in human biology and disease", says Mathias Uhlen, Director of the Human Protein Atlas consortium. The work was funded by the Knut and Alice Wallenberg Foundation

Link to the new version of the Human Protein Atlas: www.proteinatlas.org

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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 are open access to allow scientists, both in academia and industry, to freely access the data for exploration of the human proteome. 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>

Figure 1. The home page of the version 23 of the Human Protein Atlas