THE HUMAN PROTEIN ATLAS – IMPLICATIONS FOR HUMAN BIOLOGY, DRUG DEVELOPMENT AND PRECISION MEDICINE

Matthias Uhlén, KTH Royal Institute of Technology and Karolinska Institute, Sweden
mathias.uhlen@scilifelab.se

Key Words: Human Protein Atlas, bioproduction, drug development, precision medicine

The Human Protein Atlas (HPA) is a Swedish-based program with the aim to map of all the human proteins in cells, tissues and organs using integration of various omics technologies, including genomics, transcriptomics, antibody-based imaging, mass spectrometry-based proteomics and systems biology. A Tissue Atlas was launch in 2015 (1) followed by a Cell Atlas in 2016 (2) and a Pathology Atlas in 2017 (3). This open access knowledge-base can be used to explore targets for next generation antibody therapeutics, as well as a discovery tool to find potential biomarkers and drug targets for disease (4,5). A focus has been to use a new drug development platform based on the affibody molecule developed in our group and use this concept for applications in cancer, autoimmune diseases and neurodegenerative diseases. Recently, we have set-up an animal cell factory using CHO cells with the aim to produce full-length proteins representing all the 2,000 secreted proteins encoded in human genome. The Human Protein Atlas program has already contributed to several thousands of publications in the field of human biology and disease and it was recently selected by the organization ELIXIR as a European core resource, due to its fundamental importance for a wider life science community. 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.

Selected recent references:

1. Uhlen et al (2015) Science 347: 394
2. Thul et al (2017), Science 356:6340
3. Uhlen et al (2017) Science (August 18)
4. Uhlen et al (2016) Mol Systems Biol. 12: 862
5. Lee et al (2016) Cell Metabolism 12;24(1):172-84