

Cell Atlas launched at ASCB 2016 Meeting

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After the completion of the human genome in 2001, another major milestone was reached with the launch of the Cell Atlas at the 2016 American Society of Cell Biology Meeting in San Francisco. An open-access interactive database with unparalleled high-resolution images, the Cell Atlas visualizes for the first time the location of more than 12,000 proteins in cells—opening the way for "spatial proteomics", an exciting new discipline which is expected to lead to a fundamental expansion in our understanding of human health and disease.

KTH Royal Institute of Technology Professor Mathias Uhlen, who is Director of the Human Protein Atlas, explains: "After the genome project, which has characterized the number of human protein-coding genes, the next step is to elucidate the function of these proteins. Being able to show the location of human proteins in time and space with subcellular resolution is an essential first step towards gaining new insights into protein function."

The Cell Atlas, part of the Sweden-based Human Protein Atlas initiative, displays high resolution, multicolour images of immunofluorescent stained cells. With more than 12,000 human proteins mapped to 30 different cellular structures, the Cell Atlas provides spatial information on protein expression patterns at a fine subcellular level. The analysis reveals a surprisingly complex cellular architecture with more than half of all proteins localized to multiple compartments. Furthermore, a significant portion was found to exhibit variation in expression at a single cell level.

In a novel twist, the project also enlisted the help of online gamers. CCP Games, Massively Multiplayer Online Science (MMOS), Reykjavik University, and the Cell Atlas team jointly developed a mini-game, "Project Discovery", for EVE Online gamers. KTH Associate Professor Emma Lundberg, Director of the Cell Atlas, says: "At any time and place in EVE Online, players are able to play the mini-game, Project Discovery, and categorize the protein expression patterns from Cell Atlas images into different organelle categories. This was a help for us in classifying organelle substructures and refining the details in the Cell Atlas.

"In particular, we expect the Cell Atlas to play a key role in the exciting new area of spatial proteomics. In order to expand our understanding of the workings of human cells from a holistic point of view, in particular in the context of health and disease, detailed knowledge about the underlying molecular system is needed," Lundberg says.

Provided by KTH Royal Institute of Technology

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