Lund adopts chromosome 19

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The genes that make up the human genome were mapped by HUGO, the Human Genome Organisation, and published in 2001. Now the project is expanding into the HUPO, the Human Proteome Organisation. Within the framework of this organisation, many hundreds of researchers around the world will work together to identify the proteins that the different genes give rise to in the human body.

"The 'proteome', the set of all human proteins, is significantly more complicated than the genome. There are over 20 000 proteins coded by the genome in the human body and each protein can have a wide variety of forms, depending on where it is processed and localised and its function", says György Marko-Varga, clinical protein science leader at the Department of Measurement Technology and Industrial Electrical Engineering.

Last autumn, the protein researchers within HUPO decided to divide themselves into international networks and take on one chromosome each. The journal *Nature* has dubbed the initiative "Adopt-a-chromosome", and each network was able to 'claim' a chromosome in which they were particularly interested. Chromosome 19 was the obvious choice for the Lund researchers.

"Together with Professor Thomas Laurell, I have conducted research on the possibility of detecting the presence of prostate cancer using developments in microchip technology. We know that a number of proteins associated with prostate cancer are controlled by chromosome 19. Logically, it was an easy decision for us at Lund University to take

on chromosome 19", says György Marko-Varga.

He is now the coordinator of a large network that had its first meeting at the Pufendorf Institute in Lund on 26 January. Researchers attended from Sweden, Norway, India, Germany, China and Spain.

Sequencing all the proteins linked to chromosome 19 is just the first step in the process. The next stage will be to develop methods to extract these specific proteins from, for example, a blood sample from a cancer patient. In the third stage, these methods will be used to see if any of the proteins from chromosome 19 are linked and correlated to prostate, brain or lung cancer, diabetes or cardiovascular disease. This will involve studying samples from biobanks (collections of tissue and blood samples) related to these diseases.

"Modern development of new drugs is almost entirely directed towards the target proteins that play a key role in a given disease. If you see that patients with a certain disease have abnormally high or low levels of a certain protein in their bodies then you can move on to see how this target protein is associated with the development of the disease. It may be possible to stop the disease by regulating the effect of the protein in question", says György Marko-Varga. "A good example is EGFR regulation in lung cancer, where I have been involved in probably the largest diagnostic study ever conducted, with thousands of patients, evaluating a personalised medicine drug in Asia."

The results of the work carried out in the network will be loaded into a publicly available database that can be used by both industrial and academic researchers worldwide.

Provided by Lund University