

Cardiovascular and Metabolic Network

PROJECT PRESENTATION:

New Technology for Research on Stem Cells and Obesity

TATAA Biocenter is a world-leader in real time PCR, a technology that has many different fields of application. Among other things it can be used to quickly and with high sensitivity measure the expression of specific genes that are affected in different illnesses or that are potential targets for new pharmaceuticals. The same technology is being used in two research projects, in the fields of stem cells and obesity respectively.

Differentiation of Stem Cells

Together with Cellartis, TATAA has identified markers for differentiating stem cells. One common method still used today is to examine the cells optically under a microscope to show differentiation, a technique based on subjective assessments and also time-consuming. Using TATAA's gene markers gives a more precise assessment and changes can be detected faster. It is also possible to determine to which type of cell the stem cell is differentiated.

The purpose of the project is to follow the differentiation of stem cells to heart cells by means of an expression panel that is scanned using real time PCR. A panel is already available and ready to be put on the market, by means of which researchers can separate undifferentiated stem cells from cells that have begun to differentiate, irrespective of cell line.

Measuring Neuropeptides

A team of researchers at the Institute of Neuroscience and Physiology at Sahlgrenska Academy, Göteborg University, is currently defining a group of genes that together give a picture of the metabolic status by animals and, by extension, also of humans. It is not possible to obtain a good picture with only one marker; a pattern of different markers is needed.

The research shows that a small number of neuropeptides, that are regulatory substances in the brain, are important not only in controlling appetite and metabolism but also, for example, in anxiety and depression. The neuropeptides are therefore of great interest as markers for metabolic diseases. With real time PCR, it is possible to measure activity in the genes that code for neuropeptides simply and quickly.

The aim of the project is to follow the concentrations of the neuropeptides via an expression panel that is scanned using real time PCR. A panel is already available for researchers to use as a tool in order to identify metabolic disorders and study

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them more closely. Differences in concentration have for example been observed in mice reared on a high fat diet compared to mice that were given normal food.

Next Stage

TATAA plans to introduce new expression panels with greater functionality within two years. TATAA hope that by using these panels it will be possible to show the stem cells' transformation into heart cells and also, perhaps, that a change in the neuropeptides can be a marker for the onset of a metabolic disorder.

At the moment, TATAA's gene market kit for neuropeptides is a research tool, but it may be able to be used in the future for diagnostic purposes in health and medical care.

PROJECT PARTICIPANTS

- **Cellartis** – A biotechnology company focused on applications in human stem cell technology and derivation of stem cell lines.
- **Institute of Neuroscience and Physiology, Sahlgrenska Academy at Göteborg University** – Research into the influence of the immune system on obesity and metabolic functions.
- **TATAA Biocenter** – Commissioned research and training within molecular diagnostics and gene expression analysis. The company has its base in research at Chalmers University of Technology.



Would you like to know more about this project? Please contact:

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Mikael Kubista
Founder
TATAA Biocenter

It is important that GöteborgBIO supports projects between small companies like us and public researchers with resources. Together we can now help to create new research tools which can become assets for many more researchers.



John-Olov Jansson
Professor, Institute of Neuroscience and Physiology,
Sahlgrenska Academy at
Göteborg University

A panel like this can greatly benefit researchers at the universities and in the pharmaceutical industry, e.g. to quickly and efficiently investigate the effect of pharmaceutical candidates for the treatment of obesity.



Peter Sartipy
Senior scientist
Cellartis

Tools designed to quickly and simply investigate differentiation of stem cells are very useful in the development of new stem cell based products and technologies.

The Cardiovascular and Metabolic Network, CVM, is a competence network and co-operation project between health care, academia and industry. Its task is to increase the number of commercialisations in the cardiovascular and metabolic area, which in the long term will lead to better applications in health and medical care and more employment opportunities. The CVM Network validates suitable development projects and provides cutting-edge competence and capital. CVM is part of GöteborgBIO.