UNIVERSITÉ DE GENÈVE

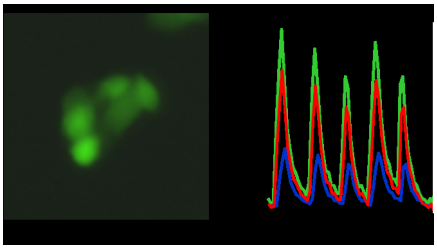
COMMUNIQUÉ DE PRESSE

Genève | 25 July 2012

under embargo until Wednesday 25 July 2012, 11pm, Swiss time

A FURTHER STEP TOWARDS PREVENTING DIABETES

Research workers at the UNIGE have developed a novel method of identifying molecules that could help to prevent diabetes.



Beta cells are loaded with a green fluorescent calcium sensing probe. The changes in fluorescence intensity are recorded over time after glucose stimulation (each colour on the graph shows the recording from a different cell). The average synchrony of all the cells in a cluster is determined using a mathematical model which is used to compare the efficacy of the drugs under testing

Having identified the important role in controlling insulin secretion played by the protein Cx36, a team of scientists at the University of Geneva (UNIGE) have perfected an innovative method which enables testing the effectiveness of thousands of molecules potentially usable in the fight against diabetes. This results of this research have already been published in the scientific review *Plos One*.

Pancreatic beta cells produce insulin, responsible for controlling blood sugar levels and thus essential for our survival. Among the numerous factors that affect the workings of these cells, a protein called Cx36 was identified a few months ago by a research team at the UNIGE. The scientists there had demonstrated that in transgenic mice, suitably modified so as not to produce any Cx36, synchronization of the beta cells ceased and insulin production went out of control. This de-synchronization of insulin secretion is the first measurable sign in people suspected of developing type 2 diabetes. Armed with this knowledge, the research team have set about finding molecules which act directly on Cx36 with the objective of developing a novel therapeutic approach to fighting diabetes.

Paolo Meda, Professor of Cellular Physiology and Metabolism in the University of Geneva's Faculty of Medicine, has set his team a real challenge - study the protein Cx36, present in minute quantities and almost impossible to detect using traditional techniques, and which has a half-life of around three hours!

Over one thousand drugs tested

Sabine Bavamian and Helena Pontes, researchers in Professor Meda's laboratory, set to work on developing a non-invasive system for understanding how Cx36 works. This project has been partly financed by the Juvenile Diabetes Research Foundation (USA) and the Swiss National Science Foundation and is using equipment in the Bio-Imaging department of UNIGE's Faculty of Medicine. The two scientists have been able to develop a new model using living cells which produce insulin and Cx36 in culture in order to be able rapidly to test a large number of potentially interesting molecules. With this novel approach, they have been able to analyse some 1040 molecules, enabling them to identify those that stimulate insulin production and those that inhibit it. Such discoveries should enable the roll out of new pharmacological treatment strategies for type 2 diabetes.

And what if animal venoms are not poisons after all?

Although there is now a large number of drugs that are prescribed for diabetics the world over to help alleviate insulin secretion de-syn-

The protein **«Cx36»** participes in the control of the insulin production

chronization, the majority of them have unfortunate side effects. And thus Professor Meda has decided to use the innovative technique developed by his team to test the effect on Cx36 of very different molecules, produced from animal venom. Such molecules should not give rise to the same type of problem posed by the traditional drugs used currently. The screening, or selection, of the venom should enable carrying out the necessary validation tests, initially in vitro, and then in vivo. «We have some 3 to 5 years work ahead of us, but we have very serious hopes of discovering molecules which act exclusively on Cx36, unlike all the currently identified molecules, with a view to limiting side-effects», explains Professor Meda. In the fight against diabetes, scientists are exploring numerous avenues, some of which are rather surprising.

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