Method offers better conditions for studying insulin-producing cells

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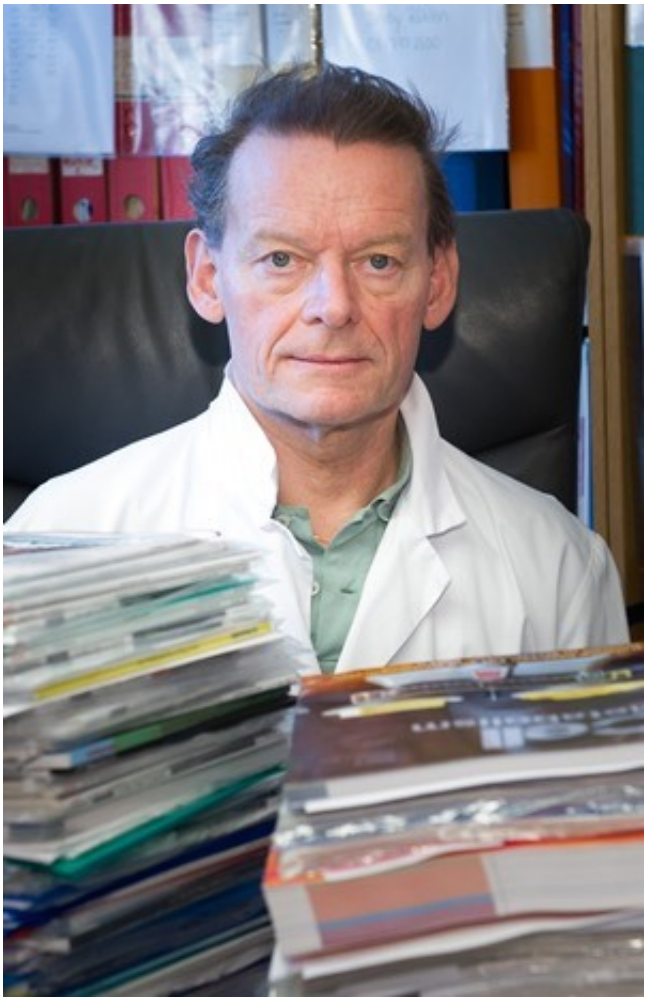

Credit: Karolinska Institutet

Researchers have established a unique method enabling them to study

the function of insulin-producing cells under conditions that are similar to those in humans. This can pave the way to development of new medicines for the treatment of diabetes.

Beta cells in the pancreas produce the hormone insulin, which plays a key role in the regulation of blood glucose levels. In diabetes, there is a partial or complete loss of beta cell function. In order to understand how insulin-producing beta cells function, it is essential to be able to study them in a model that reflects the physiological and pathological processes in humans.

The cornea as a window into the body

In previous studies, Professor Per-Olof Berggren's research group has shown that the structure and function of the hormone secreting part of the pancreas, the islets of Langerhans, are different in mice to those in humans, while those in monkeys are similar to those in humans. There is therefore a medical need to be able to study the islets of Langerhans in live monkeys. In a new study, recently published in the scientific journal *Cell Reports*, the researchers have developed a unique method for monitoring the function of insulin secreting beta cells from monkeys that have been transplanted into the anterior chamber of the eye of the same monkeys. This enables the cornea to be used as a window into the body, and to study beta cell function non invasively for a longer period of time.

"By using this human-like model, we have shown that blood vessels have an active and dynamic role with regard to the function of the islets of Langerhans in monkeys. This is an important study contributing to increased understanding of the physiology and pathology of human islets of Langerhans," states Per-Olof Berggren, Professor at the Rolf Luft Research Centre for Diabetes and Endocrinology, Department of Molecular Medicine and Surgery at Karolinska Institutet and Visiting Professor at Lee Kong Chian School of Medicine, Nanyang

Technological University, Singapore, who has led the study.

Identify new regulatory steps

Per-Olof Berggren points out that in the future, use of this technique will enable identification of not only new regulatory steps for the insulin secreting beta cells' function and survival, but also of new medicines targeting these regulatory steps, which will be critical for treatment of diabetes. It may also be possible eventually to use this technique in the clinic to monitor the function of the hormone-secreting part of the pancreas.

More information: Barbara Leibiger et al. PI3K-C2α Knockdown Results in Rerouting of Insulin Signaling and Pancreatic Beta Cell Proliferation, *Cell Reports* (2015). DOI: 10.1016/j.celrep.2015.08.058

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