New research redraws pancreas anatomy

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(Medical Xpress) -- Research from Karolinska Institutet shows that insulin secretion in the pancreas is not under direct neural control, as has previously been thought. The few nerves that are present are connected to blood vessels, not to gland cells.

Thanks to the secretion of the correct amount of insulin and other hormones, the body is able to maintain an almost constant level of blood sugar. Hormone secretion is partly governed by the autonomic (non-voluntary) nervous system; however, precisely how the nerves of the human body are connected to the pancreas has always been unclear.

Applying advanced microscopic techniques, researchers at Karolinska Institutet and the University of Miami have now zoomed in on the islets of Langerhans, containing the hormone-secreting cells of the pancreas. They discovered that there are only a few nerves in the human islets of Langerhans, which is in marked contrast to the mouse, where the islets of Langerhans are better studied and found to be rich in nerves. Another difference that they discovered was that most of the nerves in the human islets establish contact with the smooth muscle cells of the blood vessels instead of with the hormone-secreting gland cells, as in mice.

The results suggest that the nervous system influences the gland cells indirectly by affecting the blood flow in the islet of Langerhans, rather than directly.

"This fundamental difference in innervation pattern in the islets of Langerhans between mice and humans is highly significant and

important, since the knowledge could form the basis for new and more specific diabetes drugs," says Professor Per-Olof Berggren, one of the leading researchers involved in the study.

More information: "Autonomic axons in the human endocrine pancreas show unique innervation patterns", Rodriguez-Diaz R, Abdulreda MH, Formoso AL, Gans I, Ricordi C, Berggren P-O and Caicedo A. *Cell Metabolism*, 6 July 2011. www.cell.com/cell-metabolism/home

Provided by Karolinska Institutet