Specific protein may help beta cells survive in type 1 diabetes

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Researchers find therapeutic potential of MANF protein to reduce beta cell stress in type 1 diabetes.

In the healthy pancreas of someone without type 1 diabetes (T1D), the hormone insulin (essential for turning food into energy) is produced, stored, and released in a normal "factory-like" process within pancreatic beta cells in response to glucose in the diet. Early in the course of T1D, however, excessive or pathologic stress in beta cells compromises their ability to properly secrete insulin, triggering a cascade of events ultimately contributing to the beta cell death. Over the past several years, JDRF-funded researchers have found evidence that beta cell stress may play a role in the onset of T1D, and are exploring possible ways to stop it from occurring, thus potentially protecting beta cell health and maintaining normal beta cell function. In April, JDRF-funded researchers in Finland released new findings in the journal *Cell Reports* that add another piece to the puzzle of beta cell stress and T1D.

Led by Dr. Mart Saarma, Dr. Maria Lindahl, and Dr. Timo Otonkoski of the University of Helsinki, along with other investigators, the study showed that a protein called MANF (mesencephalic astrocyte-derived neurotrophic factor) may help protect beta cells from experiencing excessive or pathologic stress response. In the study, mice deficient in the protein developed rapid-onset of T1D due to a decrease in beta cell mass after birth. In contrast, overexpression of the MANF protein in mice resulted in increased beta cell regeneration and promoted beta cell survival in this mouse model of T1D. The study indicates that MANF protein may thwart beta cell stress, promoting the proliferation and survival of beta cells—information that could prove valuable in the translational development of beta cell survival therapies for humans with T1D in the future.

These findings come one year into a three-year research grant from JDRF to support the discovery and development of potential methods to protect and regenerate beta cells in people with T1D. Still, more research needs to be done in additional animal models of T1D, as one model alone does not precisely mimic the complex pathogenesis of T1D in humans. Additionally, preliminary findings will be validated with human beta cells. The growing knowledge of beta cell biology, thanks to studies like this one, helps to open multiple paths toward potentially preserving and restoring beta cell function in people with T1D.

More information: Paper: www.cell.com/cell-reports/pdf/S2211-1247%2814%2900201-0.pdf

Provided by JDRF