The Role of Tcf19 in Diabetes

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**Diabetes Background**

**Type 1 Diabetes**
- Autoimmune
- Occurs in children or adults
- Destruction of the insulin producing cells (beta-cells) in the pancreas
- Insulin replacement therapy is required

**Type 2 Diabetes**
- Occurs in both children and adults
- Associated with obesity
- Characterized by insulin resistance in tissues and beta-cells
- Can be treated with oral medications

**Diabetes and Aging**
- Approximately 27% of the population over the age of 65 has diabetes
- During aging, there is a natural decline in the insulin production capacity of your pancreas which can lead to elevated blood glucose

**Diabetes Complications**

**Tcf19 is necessary for beta-cell growth**

Figure 2 Tcf19 knockdown results in reduced beta-cell growth and proliferation. A. An immortalized rat cell line (INS-1) was transfected with siTcf19 or siSCR (scrambled control). Cell growth was reduced, as measured by viable cells per ml of culture media. B. Cell cycle genes were analyzed using quantitative reverse transcriptase PCR.

**Tcf19 Background**

- Largely uncharacterized
- Expressed during cell division
- Highly expressed in the pancreas
- Has been linked to both Type 1 and Type 2 Diabetes

**Generation of Tcf19 Knockout mouse model**

Figure 3 Tcf19 expression in pancreatic islets of wild type and fl/fl mutant Tcf19 mice.

**Tcf19 is located in many tissues in both mice and humans**

Figure 1 Tcf19 expression in mouse and human tissues. A. Tcf19 expression is highest in islet and is upregulated with obesity in both mouse and human. Quantitative RT-PCR analysis of Tcf19 expression across 13 tissues in lean B6 mice at 10 weeks old, and islet from obese B6 mice at 18 weeks old. B. Tcf19 expression is found in many tissues throughout the human body, however expression is highest in the pancreas. This figure was adapted from BioGPS.

**We are in the process of determining:**
- Body Weight
- Blood Glucose Levels
- Pancreatic islet gene expression

**Do these mice develop diabetes?**

**Acknowledgements**

DBD has received support from the NIDDK, VA Hospital, UW-Madison SMPH. DAF receives funding through NIH T32 AG000213-22A1.