Overexpression of eukaryotic translation initiation factor 2A (eIF2A) in beta cells attenuates diabetes in Akita mice

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Background and *in vitro* findings

Translational control in ER stress

Akita mouse model and experimental design

Akita mutation in insulin gene

♀ C57BL/6-*Ins2*^{Akita/WT/J}

BW – Body Weight
BG – 4-hr fast Blood Glucose
IPGTT – Intraperitoneal Glucose Tolerance Test (4-hr fast, 1g/kg i.p. glucose)
GSIS – Glucose Stimulated Insulin Secretion *in vivo*

Results

Body weight

Fasting blood glucose

IPGTT

β-cell area

In vivo GSIS

Expression of ER stress markers in isolated islets

Summary and conclusions

- eIF2A is an alternative translation factor that is highly enriched in beta-cells and plays protective role during ER stress
- Female *Ins2*^{Akita/WT} mice overexpressing eIF2A have lower fasting blood glucose levels and slower diabetes progression
- eIF2A overexpression improves glucose tolerance and glucose-stimulated insulin secretion in female *Ins2*^{Akita/WT} mice
- Adenoviral overexpression of eIF2A mitigates pro-apoptotic UPR signaling in pancreatic islets of female *Ins2*^{Akita/WT} mice