The Mauvais-Jarvais Lab: Type 1 Diabetes Research

Protecting insulin-producing islet beta-cells from damage could prevent type 1 diabetes, and the Lab of **Franck Mauvais-Jarvis** has demonstrated that the female hormone "estrogen" is a powerful protector of islet cells. However, systemic "carpet bombing" with this hormone is problematic – due to increased risk of breast and uterine cancer in females, feminization in males, and growth arrest in children.

The lab has developed a way to selectively target estrogen to the islet cells, converting "carpet bombing" with estrogen into a targeted "drone strike". The "drone" in this case is an FDA-approved peptide that allows for selective delivery and uptake of estrogen by islet beta-cells – providing all of the diabetes-relevant protective effects of estrogen without the side effects. The approach has been validated in multiple model systems, including one utilizing human islet cells in diabetic mice. It also has the added benefit of combining and applying two FDA-approved drugs in a novel way, allowing a faster pathway to the clinic.

Following translational validation in non-human primate studies, the approach could very quickly be accelerated into human trials and, if successful, the clinic.

Highlights:

- Estrogen can protect islet cells, but has too many systemic side effects to be given by itself
- The Mauvais-Jarvis Lab's novel compound can direct the estrogen specifically to the islet cells, using a peptide coupled to the estrogen that functions as a "drone" to target only these cells
- Efficacy seen in multiple mouse models, including human islet cells in humanized mice
- Both drugs are already FDA approved, significantly decreasing future potential regulatory and approval burden prior to human clinical trials
- Tulane is a unique and advantageous location for this work, having the infrastructure in place for both peptide synthesis and NHP studies
- Timeline to humans: 2-3 years

Type I Diabetes

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