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Punicic acid as a possible supplemental treatment of adolescent type I diabetes

Murriel Grimes

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Background

Type 1 Diabetes

- Diabetes mellitus type 1
- Chronic metabolic disease where the pancreas doesn't produce insulin⁷
- 5% of the 415 million diagnosed with diabetes have type 1⁶

What causes it?

- Usually follows the body's autoimmune response to⁶
 - Genetics
 - Viruses
 - Environmental factors

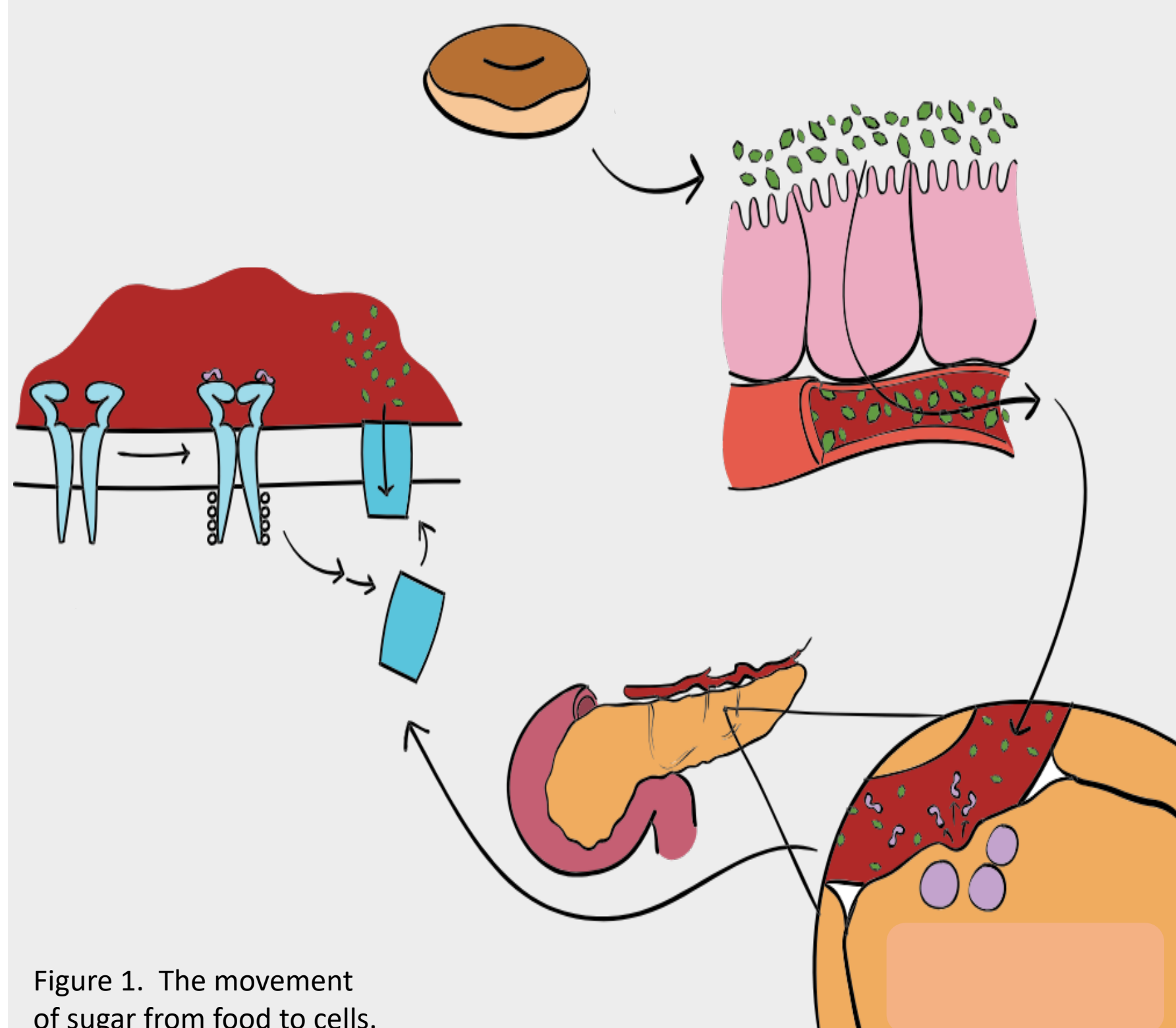


Figure 1. The movement of sugar from food to cells.

Problems with insulin

- Prices have nearly doubled from 2012 to 2016, with this trend continuing⁸
- **We need a more affordable, accessible treatment for this disease**

Specific Aim

Punicic acid

- Component of pomegranate oil

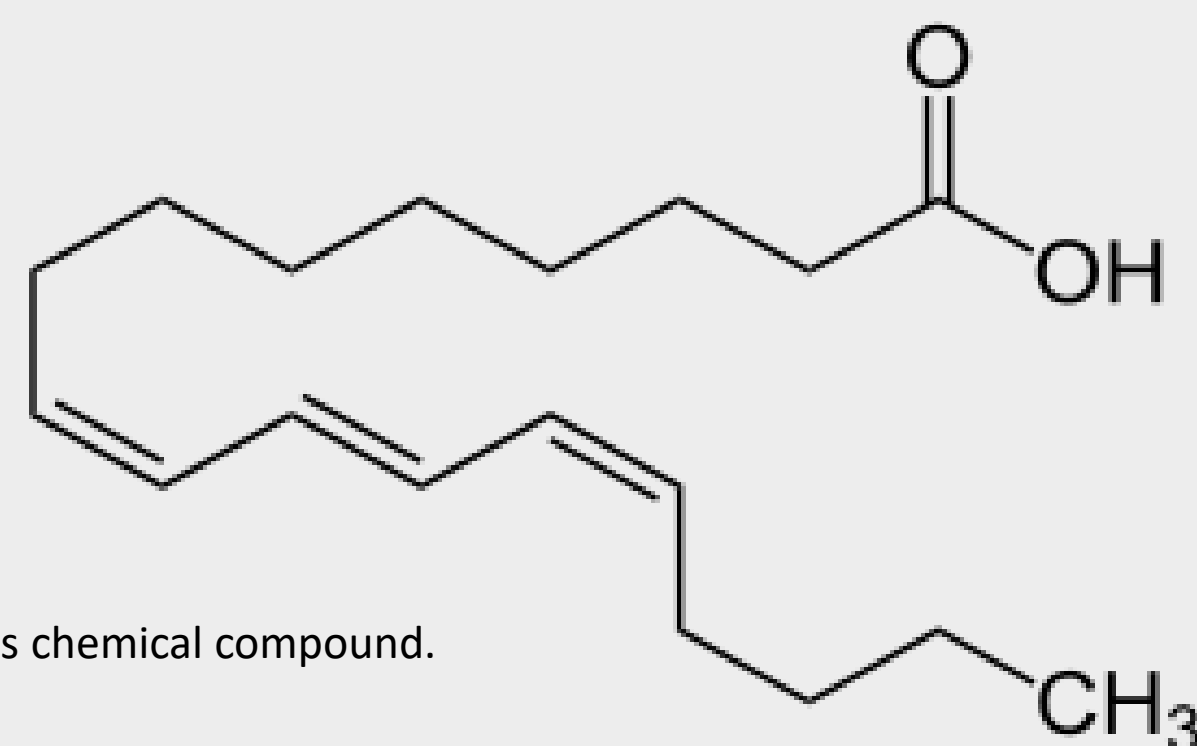


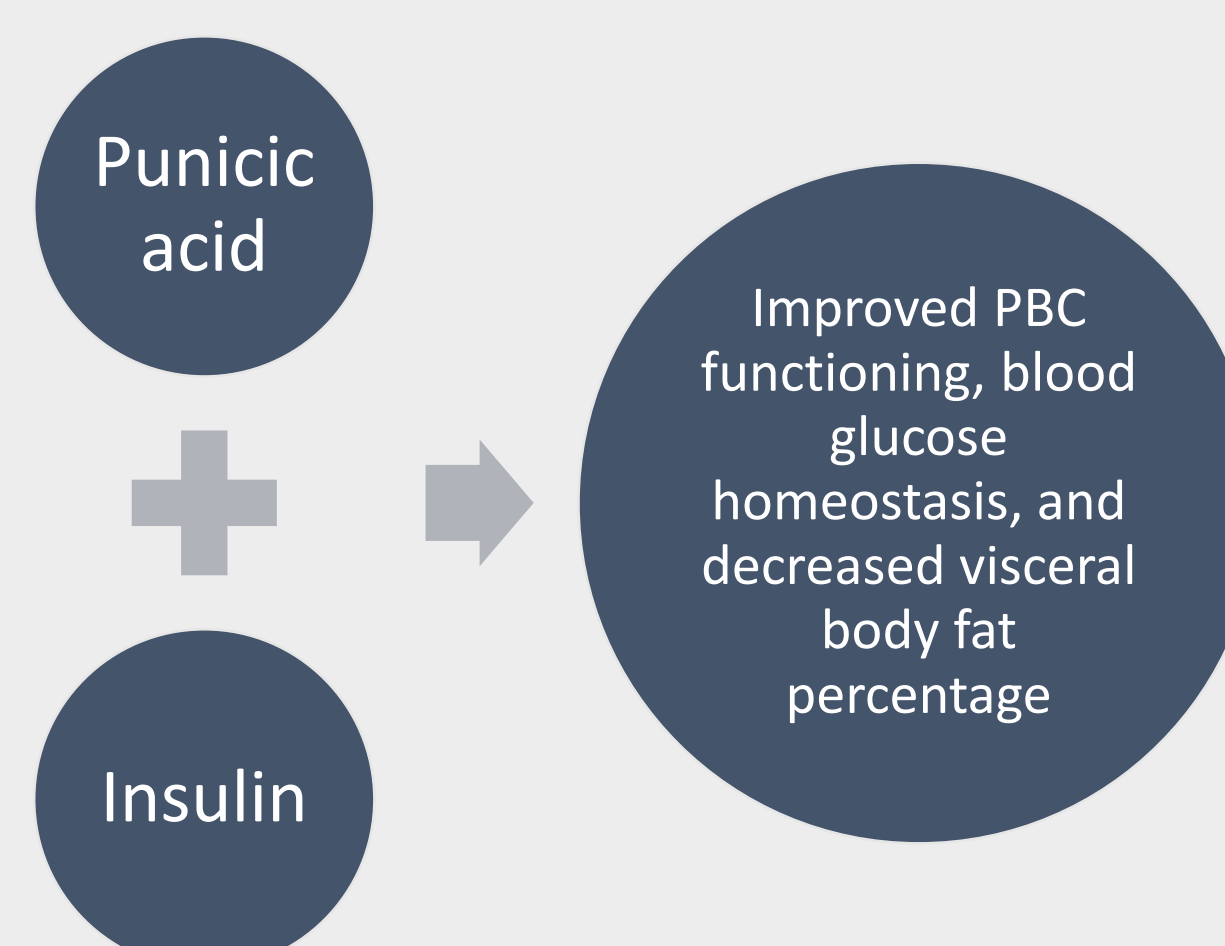
Figure 2. Punicic acid's chemical compound.

- There has been success with punicic acid as a treatment for type 2 diabetes in the past⁵
- **I propose that we investigate punicic acid's antidiabetic effects on type 1 diabetes**

Research Question

Will a combination of punicic acid and insulin have antidiabetic effects on type 1 diabetes patients?

Hypothesis



Potential Pitfalls

What could go wrong?

- No improvement in:
 - Beta cell function
 - Blood glucose level homeostasis
 - Visceral fat percentage



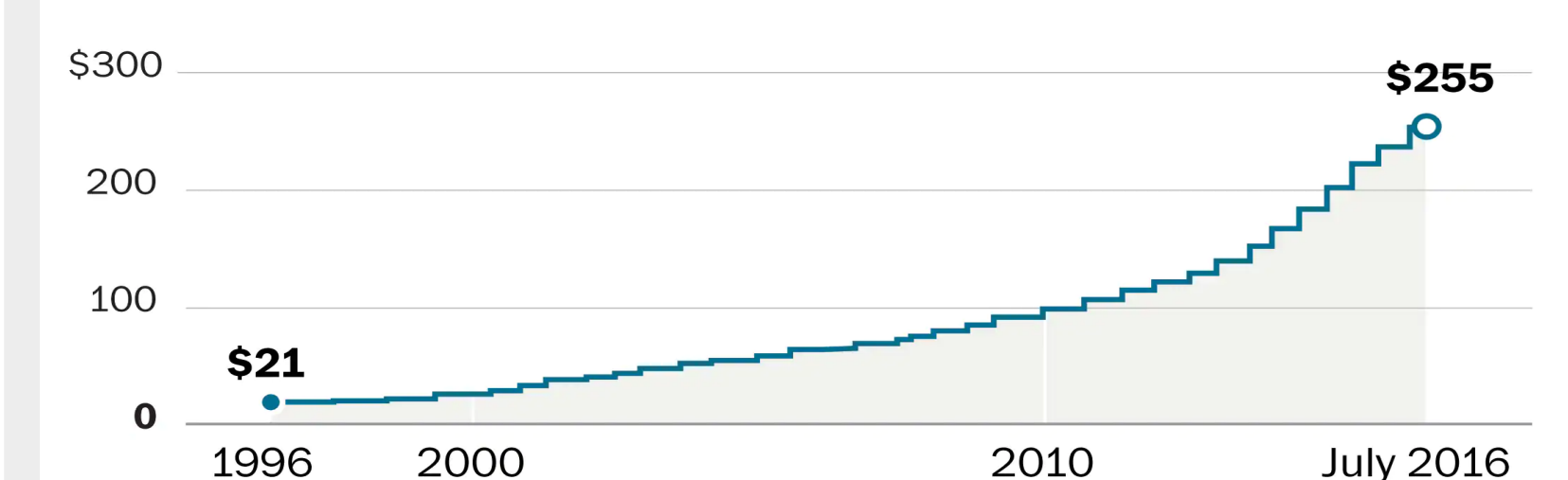
- Subjects being treated with insulin showed improved results over insulin + punicic acid

Potential Conclusions

- Improved PBC functioning, blood glucose homeostasis, and decreased visceral fat percentage
- Better knowledge of type 1 diabetes
- Increase in the manageability of the disease
- Alternative to insulin treatments

The list price of Humalog insulin keeps going up

Since 1996, there have been more than two dozen price increases on a vial of Humalog insulin. Adjusted for inflation, the current price is 700% higher than it was 20 years ago.



Note: List price is in unadjusted dollars and does not reflect rebates or discounts
Source: Truven Health Analytics THE WASHINGTON POST

Figure 3. Graph showing an increasing trend of insulin prices.

Methods

Induce type 1 diabetes in adolescent rats

Allow control group to function normally

Treat group of rats with insulin

Treat group of rats with insulin + punicic acid

Measure blood-glucose levels of each rat after 16 weeks

Literature Cited

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