CAR T Preventive/Therapeutic approach for Type 1 Diabetes

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Technology description

Background

Type 1 diabetes (T1D) is an autoimmune disease with no cure and is currently treated with daily insulin injections. Cytotoxic T cells have been shown to contribute to the progression of the disease, and can be down regulated to control the attack on insulin-producing beta cells. Regulatory T cells (Tregs) have been investigated as a possible therapeutic for T1D due to their ability to down-regulate cytotoxic T cells. However, this approach has been limited by the scarcity of antigen-specific Tregs that have the ability to suppress the autoimmune disease. Therefore, there is a need for antigen-specific Tregs on demand.

Invention Description

Researchers at the University of Toledo have developed pancreatic beta-cell-specific chimeric antigen receptor (CAR) Tregs. Typical CAR T therapy involves modifying T cells from the host to target antigens. In this study, two GAD65 B Cell epitope regions were selected for incorporation onto the T cell receptors and tested in a spontaneous T1D mouse model. 30 day glucose tolerance tests showed significant improvement over controls.

Publication:Imam S, Prathibha R, Dar P, Almotah K, Al-Khudhair A, Hasan S, Jilani T, Mirmira R, Jaume J. eI5A inhibition influences T cell dynamics in the pancreatic microenvironment of the humanized mouse model of Type 1 Diabetes. Scientific Reports 9, Article number 1533 (2019).

Application area

- Prevention/Treatment for type 1 diabetes (T1D)

Advantages

- No other therapeutic for T1D has been developed
- Less expensive than lifetime daily insulin injections
- Tested in a T1D humanized transgenic mouse model

Institution

University of Toledo

Inventors

Juan Jaume
Professor & Co-Director
Clinical, CeDER
Shahnawaz Imam
Research Associate
Medicine