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Jack Woodfield

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The results of a new clinical trial testing a type 1 diabetes vaccine have been presented at the 75th Scientific Sessions of the American Diabetes Association.

The genetic vaccine bacillus Calmette-Guerin (BCG) has been shown to reverse advanced type 1 diabetes in mice, and could help to restore proper immune response to insulin- producing beta cells.

The findings of this FDA-approved clinical trial were presented by principal investigator Dr Denise Faustman, PhD, director of the Massachusetts General Hospital Immunobiology Laboratory.

The BCG vaccine is based on a harmless strain of bacteria related to one that causes tuberculosis. It is also approved by the FDA for treatment of bladder cancer.

Faustman explained the BCG could induce a permanent gene expression that restores regulatory T cells (Tregs), helping to prevent the immune system attack which characterises type 1 diabetes.

"BCG is interesting because it brings into play so many areas of immunology that we as a community have been looking at for decades, including Tregs and the hygiene hypothesis," said Faustman.

"Repeat BCG vaccination appears to permanently turn on signature Treg genes, and the vaccine's beneficial effect on host immune response recapitulates decades of human co-evolution with myocbacteria, a relationship that has been lost with modern eating and living habits."

Researchers worldwide have been examining the benefits of Tregs, but Faustman said that existing therapies have struggled to achieve long-term results. However, with BCG able to restore Tregs, this provides a clearer picture as to how vaccination works to reset the immune system within type 1 diabetes.

Faustman's team was the first to document type 1 diabetes reversal in mice and in a subsequent phase I trial demonstrated successful human clinical results who had received the BCG vaccination. Long-term data from the study is expected to be published later this year.

Now a five-year, 150-person, phase II trial is enrolling to assess whether repeat BCG vaccination can improve or even reverse advanced type 1 diabetes in adults.

Earlier this year Belgian biotech company, Imcyse, announced they will begin human trials across Europe of a separate type 1 diabetes vaccine, with results expected in 2018.