

Spontaneous Type I Diabetes Mouse Model

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Technology description

Background

Although the NOD mouse is the current standard for studies of type I diabetes (T1D), no curative therapies resulting from this model have passed clinical trials. Knock in/out models cannot be used to mimic the total pathophysiology of diabetes. In order to develop a cure for T1D, there is a need for an animal model of human T1D that resembles the human disease and as such exhibits the complications of diabetes.

Invention Description

Researchers at the University of Toledo have developed a triple transgenic mouse with human T1D susceptibility that closely resembles the human disease and its complications. The mice are a crossing of HLA-DQ8 and human GAD65 for more than 30 generations based on impaired fasting glucose. The result is a transgenic mouse model in which known human beta cell autoantigens are presented to effector T cells in the context of human diabetes susceptibility genes.

Application area

- Animal model for autoimmune diabetes disease mechanisms
- Animal model for the development of antigen-specific immune interventions
- Animal model for the hyperglycemic complications of diabetes such as nephropathy, neuropathy and retinopathy

Advantages

- Human chronicity of the model allows for therapeutic intervention before the loss of beta cell function
- These animals show diabetes complications found in the human disease, such as retinopathy, nephropathy and neuropathy

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