



Novel Immunotherapy for the Treatment of Autoimmune Diseases

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Technology Summary

Autoimmune disorders, such as Type 1 diabetes, transplant rejection, and graft-versus-host-disease (GVHD) are caused by the patient's own immune system attacking his or her own cells. One of the key challenges is to determine how to silence the autoimmune reaction, which is termed tolerance. One of the mechanisms to do so is to suppress the self-reactivity with a specific population of regulatory T-cells (T-regs).

In non-obese diabetic (NOD) mice, it is known that $CD25^+CD4^+$ T-cells inhibit diabetes development, but they do not exist in sufficient numbers to effectively prevent the disease. Our researchers have discovered a way to increase the numbers of these suppressor T-cells using dendritic cells, a specialized cell of the immune system. In addition, their method also allows for the creation of a population of T-regs that is specific for a particular antigen by exposing naïve T-regs to dendritic cells, the antigen, and TGF- β 1. Their results indicate that the expanded suppressor T-cells are effective in delaying the onset of diabetes and reducing the incidence of diabetes. These cells are able to suppress autoimmunity even when disease is developing rapidly.

Advantage

- This method requires a low number of the suppressor cells prior to expansion.
- Effectively treats the autoimmune disorder without causing general suppression of the immune system.
- Naïve T-regs can be differentiated to become antigen-specific.

Area of Application

Development of new specific immunotherapies for autoimmune disorders, such as Type 1 diabetes, transplant rejection, and GVHD.

Stage of Development

NOD (non-obese diabetes) mouse models studied show suppression of autoimmunity in vivo, including protection of islet grafts.

Lead Inventor

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Patent Information

U.S. Patent 8,563,308

References

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