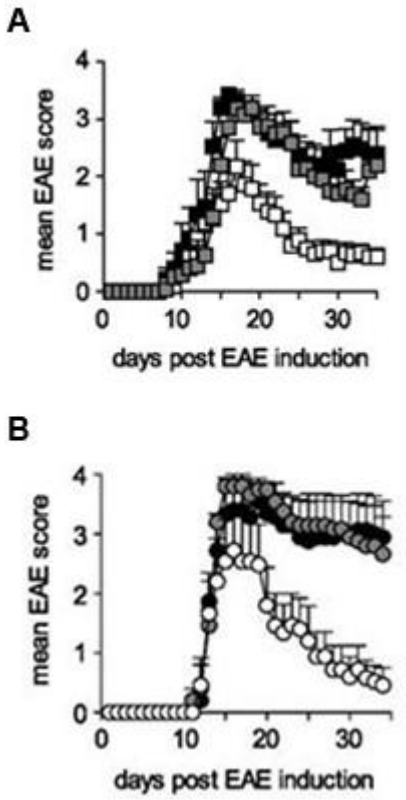
Technology Offer

Quiescent B Cells for immune suppression in gene therapy

Reference Number TO 22-00009

Challenge

B cells are well-known for their roles in humoral immunity. Recently, a novel role for B cells as potent immunosuppressive cells *in vivo* has been described. In order to make clinical use of these suppressive features of B cells to suppress immune reactions against auto antigens, therapeutic proteins, gene therapy products and grafts, methods are required to re-design resting B cells into antigen-specific immune suppressive B cells while keeping them in a non-stimulatory state.



A) Treatment with engineered B cells protects recipient mice (white square) from EAE development in an inducible system. B) Adoptive therapy with engineered B cells protects recipient mice (white circle) from a non-remitting form of the autoimmune disorder EAE, allowing a full recovery.

Technology

The technology relates to engineering resting B cells into “resting regulatory B cells” combining the weak immunogenicity of quiescent cells, and the suppressive and antigen-presentation features of activated B cells. This is accomplished with a lentiviral vector allowing expression of any desired antigen in native B cells. After transformation, B cells remain quiescent, as demonstrated by lack of IL-6 secretion and of activation-marker expression. Such engineered B cells inhibit specific CD4 T, CD8 T, and B cells in recipient mice and induce complete remission from Experimental Autoimmune Encephalomyelitis (EAE) immune disorder in mice upon adoptive transfer.
The method described is fast and easily applicable, effectively proven to work in mice and potentially suitable for the treatment of several different immune disorders.
The technology is expected to be beneficial for the treatment of autoimmune diseases, should reduce adverse immune reactions in graft-versus-host diseases, and should prevent immune reactions against protein drugs in biologics and gene therapy.

Commercial Opportunity

In-licensing for the clinical development; collaboration opportunity.

Patent Situation

EP10075225 pending
PCT WO2011/147622

Further Reading

Fillatreau et al., Eur. J. Immunol. 2011, 41, 1696-1708

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