Signal-1/Signal-2 Bifunctional Peptide Inhibitors

**Summary:**
This invention provides a method of modulating T-cell pathways and subsequent immunity in a very specific manner.

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**Overview:**
Autoimmune diseases are characterized by the activation of T-cells against self-antigens. The T-cells then destroy the cells producing the antigens. The diseases and conditions associated with this immune response are generally associated with a specific protein on the cell surface: major histocompatibility complex class II molecules (HMC-II).

A defining stage in the immune response occurs when the T-cells differentiate into type 1 and type 2 helper cells. Activation of either pathway requires a two-signal mechanism. Signal-1 occurs when the T-cell antigen receptor recognizes the peptide-HMC-II complex on the antigen cell surface. Signal-2 occurs upon binding of Signal-2 receptors to their ligands on the surface of the antigen presenting cells.

**How it works:**
The core invention surrounds a novel AB peptide, wherein the A can bind with a major histocompatibility complex on an antigen-presenting cell and B can bind with Signal-2 receptor on an antigen-presenting cell. This design creates a new class of immunotherapeutic peptides aptly termed bifunctional peptide inhibitors. As a result, the invention provides a method of modulating T-cell pathways and subsequent immunity in a very specific manner such that the product of this invention targets only specific disease-associated populations of these cells.

**Patents:**
US 7,786,257

**Additional Web Content:**
Contact the inventor, Joseph Murray, Teruna Siahaan, Yong-Bo Hu.