New Immunomodulatory Compounds

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BACKGROUND

Regulatory T cells (Treg) play a critical role in controlling immune responses, chronic inflammation and autoimmune disease. Integrin activation in CD4+ FoxP3+ Treg is crucial to the maintenance of Treg numbers and function *in vivo.* Tregs also express high levels of the low affinity IL2 receptor CD25 (IL2Ra, TAC) on their cell surface. One mechanism by which Tregs are thought to limit immune responses is by sequestering the available IL2, effectively starving effectors and leading to peripheral tolerance. Previous work by the inventors showed that activation of integrin adhesion receptors were critical to the functioning and maintenance of peripheral Tregs. The present invention describes antibodies that specifically activate integrins on Tregs but not on conventional T cells. These antibodies promote the proliferation and outgrowth of Tregs but not of conventional T cells *in vitro.*
Thus, treatment with such antibodies would be expected to ameliorate auto-immunity.

TECHNOLOGY DESCRIPTION

Researchers at UC San Diego have an invention that generates the production of engineered antibodies, which can stimulate integrin activation and ligand binding that can be used to promote Treg function *in vitro* and *in vivo*. The engineered thereof can be used to suppress immune responses. One example would be for the treatment of auto-immune diseases such as Systemic Lupus Erythematosus or inflammatory bowel disease or in the context of alleviating organ transplantation rejection e.g. pancreatic islet transplantation. They also disclose the use of integrin activation as a reporter for selection of antibodies, other biologics, peptides and small molecules that promote the development and maintenance of the Treg pool.

APPLICATIONS

Appropriately engineered can be used to boost regulatory T cell function *in vivo* improving autoimmune diseases and preventing transplant rejection.

ADVANTAGES

These antibodies will enable selective enhancement of the function of T regulatory cells to suppress immune responses. Integrin activation is simple to measure and provides a powerful screening tool for agents that will promote Treg function.

STATE OF DEVELOPMENT

Our invention is at the concept and experimental data stage. We have confirmed that treatment of T cell populations with a prototype antibody that rapidly activates the all classes of integrins on regulatory T cells in a dose dependent manner.

INTELLECTUAL PROPERTY INFO

The technology is patent-pending and is available for licensing.

PATENT STATUS

Patent Pending

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OTHER INFORMATION

KEYWORDS

Regulatory T cells, systemic lupus erythematosus, therapeutics, transplantation, autoimmune disease, immunotherapy, Inflammatory bowel disease, immune modulation, integrin

CATEGORIZED AS

- **Medical**
  - Disease: Autoimmune and Inflammation

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