

Inhibition of T Cell Differentiation and Senescence by Overexpression of Transcription Factor c-Myb

Summary

Researchers at the National Cancer Institute (NCI) have developed a method by which memory T cells can be generated from other T cell populations using overexpression of the transcription factor c-Myb. Importantly, these reprogrammed memory T cells show increased proliferative and survival capacity. This strategy could also potentially generate anti-tumor T cells with improved viability and therapeutic efficacy for adoptive ACT. Researchers at the NCI seek licensing and/or co-development research collaborations for this invention.

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E-232-2015

Product Type

- Therapeutics

Keywords

- Stem Cell, T Cell, Immunotherapy, Cancer, Infectious Disease, T Cell Receptor, TCR, Adoptive Cell Transfer, ACT, Chimeric Antigen Receptor, CAR, Gattinoni

Collaboration Opportunity

This invention is available for licensing and co-development.

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Description of Technology

Adoptive Cell Therapy (ACT) is a promising technique that uses a patient's own T cells to treat cancer. The process requires removing and engineering a patient's T cells to express a chimeric antigen receptor (CAR) or T cell receptor (TCR) that targets a specific cancer antigen. When the modified T cells are reintroduced into the patient, the T cells attack and kill cancer cells that express the antigen, thereby treating the patient. Although ACT holds a great deal of promise, there are still technical drawbacks to be overcome, such as loss of anti-tumor activity due to T cell senescence.

This invention addresses this technical drawback by using T cells that express the transcription factor c-Myb (or a functional variant thereof) at elevated levels as the host for transduction with CARs or TCRs. T cells that exhibit elevated expression of c-Myb display inhibited differentiation, allowing the cells to survive, proliferate and serve in a therapeutic capacity for a longer duration. Since it is believed that these characteristics can increase the effectiveness of ACT, T cells with elevated levels of c-Myb expression are strong candidates for use in ACT.

Potential Commercial Applications

- Adoptive Cell Therapy (ACT) using chimeric antigen receptors (CARs), or engineered T cell receptors (TCRs)
- Treatment of cancers that express specific cell surface proteins

Competitive Advantages

- Elevated expression of c-Myb in T cells allows them to resist differentiation, thus cells survive and proliferate in greater numbers
- Increased survival and proliferation of T cells allows for a prolonged therapeutic effect

Inventor(s)

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Development Stage

- Pre-clinical (in vivo)

Patent Status

- **U.S. Patent Filed:** U.S. Patent Application Number PCT/US2016/048435 , Filed 24 Aug 2016
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Therapeutic Area

- Cancer/Neoplasm

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