

## Methods of Producing Effective T-cell Populations Using Akt Inhibitors

### Summary (1024-character limit)

Adoptive cell therapy uses cancer reactive T-cells to effectively treat cancer patients. Producing many persistent T-cells is critical for successful treatments. Researchers at the NCI seek licensing and/or co-development research collaborations for a novel method of producing effective T-cell populations using Akt inhibitors.

### NIH Reference Number

E-013-2016

### Product Type

- Research Tools
- Therapeutics

### Keywords

- Akt, Protein kinase B, T-cells, Cancer, Immunotherapy, Adoptive Cell Therapy, ACT, Restifo

### Collaboration Opportunity

This invention is available for licensing and co-development.

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### Description of Technology

Adoptive cell therapy (ACT) uses cancer reactive T-cells to effectively treat patients. However, several obstacles inhibit the successful use of ACT for cancer treatment. Current approaches for the expansion of T-cells may produce T-cells with a terminally differentiated phenotype that is associated with diminished anti-tumor activity and poor capacity for long-term persistence. Thus, there is a need for improved methods of obtaining an isolated population of effective T-cells for ACT.

Researchers at the NCI have developed a method of producing large populations of minimally-differentiated T-cells using an Akt inhibitor. The researchers discovered that inhibition of the serine/threonine kinase, Akt, also known as protein kinase B, effectively uncouples T-cell expansion from differentiation. This uncoupling allows for the generation of more robust T-cells with greater anti-tumor efficacy than differentiated T-cells. The researchers found that Akt inhibition also promotes the genetic

and metabolic characteristics of long-lived memory T-cells. This discovery provides a method of producing an isolated population of cancer reactive T-cells suitable for ACT.

The National Cancer Institute, Surgery Branch, is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate or commercialize a novel method of producing effective T-cell populations using Akt inhibitors.

### **Potential Commercial Applications**

- Clinically-feasible method of using small molecules to enhance the efficacy of immunotherapy for advanced cancer patients
- Useful for the generation of highly effective cancer reactive T-cell

### **Competitive Advantages**

- No other pharmacologic approach available to effectively uncouple T-cell expansion and differentiation
- Produces increased number of persistent, cancer reactive T-cell

### **Inventor(s)**

Nicholas P Restifo (NCI), Joseph G Crompton (NCI)

### **Development Stage**

- Pre-clinical (in vivo)

### **Publications**

Crompton JG, et al. Akt inhibition enhances expansion of potent tumor-specific lymphocytes with memory cell characteristics. [[PMID 25432172](#)]

van der Waart AB, et al. Inhibition of Akt signaling promotes the generation of superior tumor-reactive T-cells for adoptive immunotherapy. [[PMID 25336630](#)]

### **Patent Status**

- **U.S. Provisional:** U.S. Provisional Patent Application Number 62/243,834 , Filed 20 Oct 2015
- **U.S. Patent Filed:** U.S. Patent Application Number PCT/US2016/057307 , Filed 17 Oct 2016

### **Related Technologies**

- [E-229-2014 - T-Cell Therapy Against Patient-Specific Cancer Mutations](#)
- [E-233-2014 - T-Cell Therapy Against Patient-Specific Cancer Mutations](#)

### **Therapeutic Area**

- Cancer/Neoplasm