

## T-Cell Therapy Against Patient-Specific Cancer Mutations

### Summary

Scientists at the National Cancer Institute developed a method to identify T cells that specifically recognize immunogenic mutations expressed only by cancer cells. NCI seeks parties interested in collaborative research to co-develop or license T-cell therapy against cancer mutations

### NIH Reference Number

E-229-2014

### Product Type

- Therapeutics

### Keywords

- T-cell, cholangiocarcinoma, immunogenic, Tran, Rosenberg

### Collaboration Opportunity

This invention is available for licensing and co-development.

### Contact

- Andy Burke  
NCI TTC

[andy.burke@nih.gov](mailto:andy.burke@nih.gov) (link sends e-mail)

### Description of Technology

Human cancers contain genetic mutations that are unique to each patient. Some of the mutated peptides are immunogenic, can be recognized by T cells, and therefore, may serve as therapeutic targets.

Scientists at the [National Cancer Institute's Surgery Branch](#) developed a method to identify T cells that specifically recognize immunogenic mutations expressed only by cancer cells. The scientists identified cancer-specific mutations from a patient with widely metastatic cholangiocarcinoma by sequencing tumor samples and comparing with normal cells. Using tandem minigene constructs encoding all of the mutations expressed by a patient's tumor, the inventors identified T cells that recognized the immunogenic mutations from the same patient. These mutation-reactive T cells have the potential to eliminate the cancer cells while sparing normal tissues since normal tissues do not express the mutations. The mutation-reactive T cells were expanded *in vitro*, and then

infused as a highly pure population back into the same patient. The patient experienced tumor regression when treated with this approach.

### **Potential Commercial Applications**

- Personalized immunotherapy with mutation-reactive T cells for mediating tumor regression in patients with immunogenic mutations;
- Mutation-reactive T cell therapy especially beneficial for cancer patients refractory to other therapies;
- A research tool to identify patient-specific immunogenic mutations in the tumor.

### **Competitive Advantages**

- This patient-specific therapy has the potential application to most epithelial cancers, which account for about 90% of cancer deaths in the United States;
- Personalized mutation-specific T cells recognize mutations harboring tumor cells only and spare normal tissues. This therapy has no tissue toxicities comparing to traditional chemotherapy and radiotherapy;
- The infusion of a highly pure population of these mutation-specific T cells may maximize therapy and result in regression of all target lesions.

### **Inventor(s)**

Eric Tran (NCI), Yong-Chen W Lu (NCI), Paul F Robbins (NCI), [Steven A Rosenberg \(NCI\)](#)

### **Development Stage**

- Clinical

### **Publications**

Tran E, *et al.* [[24812403](#)]

Robbins P, *et al.* [[23644516](#)]

Tran E, *et al.* [[25046408](#)]

### **Patent Status**

- **PCT:** PCT Application Number PCT/US2014/058796, Filed 02 Oct 2014

### **Therapeutic Area**

- Cancer/Neoplasm

### **Updated**

Thursday, April 13, 2023

**Source URL:** <https://techtransfer.cancer.gov/availabletechnologies/e-229-2014>