

## RAPID MANUFACTURE OF RETROVIRAL VECTORS ENCODING TUMOR-SPECIFIC T CELL RECEPTORS FOR ADOPTIVE CELL IMMUNOTHERAPY

### SUMMARY (1024-CHARACTER LIMIT)

Researchers at the National Cancer Institute (NCI) have developed a novel method enabling rapid, GMP-compliant manufacture of retroviral vectors encoding anti-tumor T cell receptors (TCRs). T cells engineered through the use of these vectors to express tumor-reactive TCRs will be useful in adoptive cell immunotherapy for the treatment of cancer. Researchers at the NCI seek licensing and/or co-development research collaborations for this invention.

### NIH REFERENCE NUMBER

E-157-2017

### PRODUCT TYPE

- Therapeutics

### KEYWORDS

- Adoptive Cell Therapy, ACT, Immunotherapy, Retroviral Vector, T Cell Receptor, TCR, T Cells, Rosenberg

### COLLABORATION OPPORTUNITY

This invention is available for licensing and co-development.

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### STATUS

Active

### 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 may serve as therapeutic targets. However, there are technical barriers making it difficult to engineer tumor-specific T cells unique to each patient. Thus, there is a need for new methods of producing these T cells in sufficient quantities to provide patients with adoptive cell immunotherapy.

Researchers at the National Cancer Institute (NCI) have developed a method that enables the GMP manufacture of gammaretroviral vectors encoding tumor mutation-specific T Cell receptors (TCRs) using transient transfection-based vector production methods. This approach encompasses the production of a fully validated 293GP master cell bank (MCB). The 293GP is a 293-based retroviral packaging cell line stably expressing the Moloney Murine Leukemia Virus gap-pol gene. This MCB has been biosafety tested to industry standards, including: testing for replication competent retrovirus (RCR), human viruses and other adventitious virus. This MCB will be used to produce a transient pMSGV1 gammaretrovirus encoding a TCR reactive to a patient-specific neoantigen. Vector supernatants will be manufactured for a single patient and used to transduce the patient's autologous peripheral blood lymphocytes; thereby generating a cell therapy product for use in a single patient.

The [NCI, Surgery Branch](#), is seeking statements of capability or interest from parties interested in licensing this invention and/or collaborative research to further develop, evaluate or commercialize this method of manufacturing vectors encoding cancer mutation-specific TCRs for adoptive cell immunotherapy.

#### **POTENTIAL COMMERCIAL APPLICATIONS**

- Personalized cell therapy targeting tumor specific mutations using gene modified T cells
- High efficiency production of GMP-compliant viral vectors

#### **COMPETITIVE ADVANTAGES**

- Method for generating autologous high frequency (up to 90%) tumor mutation-specific T-Cells directed against mutations expressed by the patient's tumor

#### **INVENTOR(S)**

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#### **DEVELOPMENT STAGE**

- Clinical

#### **PATENT STATUS**

- **U.S. Provisional:** U.S. Provisional Patent Application Number 62/639,272 , Filed 06 Mar 2018

#### **RELATED TECHNOLOGIES**

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

#### **THERAPEUTIC AREA**

- Cancer/Neoplasm