

T-CELL RECEPTORS TARGETING KITA-KYUSHU LUNG CANCER ANTIGEN 1 (KK-LC-1)

SUMMARY (1024-CHARACTER LIMIT)

Researchers at the National Cancer Institute's Experimental Transplantation and Immunology Branch (NCI ETIB) have developed a T Cell receptor (TCR) that specifically targets the Kita-Kyushu Lung Cancer Antigen 1 (KK-LC-1) 52-60 and 90-99 epitopes which are highly expressed by several common and aggressive epithelial tumor types.

NIH REFERENCE NUMBER

E-082-2018

PRODUCT TYPE

- Therapeutics

KEYWORDS

- T-cell Receptor, TCR, Kita-Kyushu Lung Cancer Antigen 1, KK-LC-1, Immunotherapy, Testis, CT83, Gastric Cancer, Lung Cancer, Breast Cancer, Hinrichs

COLLABORATION OPPORTUNITY

This invention is available for licensing and co-development.

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STATUS

Active

DESCRIPTION OF TECHNOLOGY

Development of T-cell based immunotherapies for the treatment of various cancers has been challenged for decades by the lack of target antigens that are only expressed by cancer cells and not normal tissues. KK-LC-1 belongs to a family of tumor antigens known as cancer-testis antigens, which have restricted expression in immune-privileged germ cells and various cancers, and not in normal life-essential tissues. This makes KK-LC-1 an attractive target for T-cell based anti-cancer therapies.

Inventors from the National Cancer Institute's [Experimental Transplantation and Immunology Branch \(NCI ETIB\)](#) have discovered two new KK LC 1 T Cell receptors (TCRs) known as the 4156 TCR and 3967

TCR. The 4156 TCR recognizes the KK-LC-1 52-60 epitope in the context of HLA-A*01:01. T cells that have been transduced to express the 4156 TCR, recognize tumor cell lines expressing KK-LC-1 in the context of HLA-A*01:01. The HLA-A*01:01 allele is expressed in 29% and 15% of the Caucasian and Black ethnicities in the USA, respectively. The 3967 TCR recognizes a new epitope of KK-LC-1 (the 90-99 epitope) and recognizes autologous target cells transfected with the KK-LC-1 antigen.

These TCRs may be used to genetically modify peripheral blood lymphocytes from eligible patients. After expansion, these genetically modified T cells can be used to treat patients. It may also be possible to use portions of the KK-LC-1 TCR in chimeric proteins for cancer therapy and/or for antigen detection assays.

POTENTIAL COMMERCIAL APPLICATIONS

- Therapeutic use against several common and aggressive epithelial tumor types

COMPETITIVE ADVANTAGES

- Differential expression profile of KK-LC-1 in cancers versus normal tissues suggests that therapy with a specific KK-LC-1 TCR would be cancer-specific and would not damage life-essential tissues
- Thousands of cancer patients each year with otherwise untreatable disease may be eligible for gene therapy with these TCRs

INVENTOR(S)

[Christian Hinrichs \(NCI\)](#)

DEVELOPMENT STAGE

- Discovery (Lead Identification)

PATENT STATUS

- **U.S. Provisional:** U.S. Provisional Patent Application Number 62/640,738 , Filed 09 Mar 2018

RELATED TECHNOLOGIES

- [E-153-2016 - New T-Cell Immunotherapy that Targets Aggressive Epithelial Tumors](#)

THERAPEUTIC AREA

- Cancer/Neoplasm