Chimeric Antigen Receptor (CAR) that Targets Chemokine Receptor CCR4 and its Use in Treating Cancer

Summary (1024-character limit)
The National Cancer Institute (NCI) seeks licensing and/or co-development of an adoptive cellular therapeutic modality that targets CCR4, which is overexpressed in certain lymphoid malignancies as well as solid tumors.

NIH Reference Number
E-258-2016

Product Type
• Therapeutics

Keywords
• Immunotherapy, Chemokine Receptor 4, CCR4, mRNA, CD3+, T cell, Allogenic, Natural Killer Cell, NK, Adult T Cell Leukemia, ATL, Lymphoid Malignancy, Solid Tumor, Perera

Collaboration Opportunity
This invention is available for licensing and co-development.

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Description of Technology
The chemokine receptor, CCR4 is a seven transmembrane G protein-coupled cell surface receptor molecule with selective expression on cells of the hematopoietic system. In adult T cell leukemia (ATL), the cell-surface expression of CCR4 on leukemic cells has been found to be nearly universal. Therefore, a CCR4-directed chimeric antigen receptor (CAR) -cell may provide an effective therapeutic against ATL.

Researchers at the National Cancer Institute (NCI), Lymphoid Malignancies Branch, developed a lentivirus-derived CAR against the CCR4 molecule. The CAR can be directed to either genetically modified autologous or to allogeneic T or natural killer (NK) -cells to develop the ATL therapy. This technology includes a method of identifying lymphoid or solid tumors that produce CCR4 mRNA and then utilizing CD3+ T cells and/or NK cells to generate genetically modified T cells and/or NK cells (autologous or allogeneic) that express the CCR4 directed CAR. The identified malignancy can then be
treated with the infusion of genetically modified T/NK cells.

The NCI seeks licensing and/or co-development of an adoptive cellular therapeutic modality that targets CCR4, which is overexpressed in certain lymphoid malignancies as well as solid tumors.

**Potential Commercial Applications**
- Identification and treatment of CCR4 mRNA producing lymphoid or solid neoplasms
- CCR4 putative biomarker in lung adenocarcinoma and other cancers

**Competitive Advantages**
- CCR4 is a more recent target for cell-based immunotherapy
- Allogenic NK cells would enable wider use of cell-based therapies

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**Development Stage**
- Discovery (Lead Identification)

**Publications**
Perera, LP, et al. Chimeric antigen receptor modified T cells that target chemokine receptor CCR4 as a therapeutic modality for T-cell malignancies. [PMID 28543380]

**Patent Status**
- **PCT:** PCT Application Number PCT/US2017/052437, Filed 20 Mar 2019
- **Foreign Filed:** - Patent Application 17778069.9, Filed 20 Sep 2017
- **Foreign Filed:** - Patent Application 2017332161, Filed 10 Sep 2017
- **Foreign Filed:** - Patent Application 3037518, Filed 20 Sep 2017
- **U.S. Patent Filed:** U.S. Patent Application Number 16/334,724, Filed 19 Mar 2019

**Therapeutic Area**
- Cancer/Neoplasm