Developing engineered autologous leukemia vaccines to target residual leukemic stem cells

Grant Award Details

Developing engineered autologous leukemia vaccines to target residual leukemic stem cells

Grant Type: Therapeutic Translational Research Projects

Grant Number: TRAN1-11259

Project Objective: Developing engineered autologous leukemia vaccines to target residual leukemic stem cells

Investigator:

Name:	Karin Gaensler
Institution:	University of California, San Francisco
Type:	PI

Disease Focus: Acute Myeloid Leukemia, Blood Cancer, Cancer

Human Stem Cell Use: Cancer Stem Cell

Award Value: $4,171,728

Status: Active

Grant Application Details

Application Title: Developing engineered autologous leukemia vaccines to target residual leukemic stem cells

Public Abstract:

Translational Candidate

A universally applicable, patient-specific leukemia vaccine engineered to express a novel immune stimulatory combination for post-remission therapy

Area of Impact

There is a critical and unmet need for new and safe treatment for older acute myelogenous leukemia (AML) patients whose current prognosis is poor

Mechanism of Action

In older patients with AML, treatment with chemotherapy can produce remission in about 50%. However, the vast majority of these individuals relapse within a year due to the persistence of residual AML and leukemia stem cells. Our engineered vaccine is designed to stimulate the patient's own immune system to generate leukemia specific immune cells that can recognize, and kill residual leukemia stem cells. Vaccination after remission could increase relapse free, and even overall survival.

Unmet Medical Need

For transplant-ineligible older AML patients, outcomes are dismal and effective immunotherapies are needed. We have shown that we can eradicate leukemia in preclinical models by treating with AML vaccines, engineered to more effectively stimulate anti-leukemic immune responses.

Project Objective

Submit Pre-IND package and conduct Pre-IND meeting

Major Proposed Activities

- Produce viral vector using clinical production methods and finalize steps for using virus to engineer novel patient-derived AML cell vaccines
- Finalize methods to collect, freeze, and engineer patient AML cell vaccines; Evaluate specificity of immune responses to AML versus normal bone marrow
- Generate engineered AML vaccines in a cell therapy production facility to establish and validate clinical manufacture; prepare for Pre-IND meeting

Statement of Benefit to California:

Curative AML treatment requires referral to a major medical center and toxic inpatient chemotherapy, creating financial and geographic challenges. Despite this therapy, most patients relapse. We propose a powerful strategy for converting patients' leukemia cells into effective vaccines that stimulate anti-leukemic immunity. Outpatient treatment with genetically engineered AML vaccines may be an effective strategy to decrease relapse by boosting anti-leukemic immune responses post-remission, .

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