Innovations
UNIVERSITY OF COLORADO
ANSCHUTZ MEDICAL CAMPUS

Novel CAR T Constructs

Product

CAR T Cell Constructs

Indication

Blood and Solid Cancers

Value Propositions

- Cells persist for longer in circulation and are effective against low antigen expressing cancer cells
- Reduced post-therapy relapse

Market

- $1.8 Billion—US CAR T Cell Market Size in 2020

Intellectual Property

- Patent pending*
- Available for licensing

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Ref# CU5685H

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Background on CU5685H

Chimeric antigen receptor (CAR) T cell therapy is a powerful treatment tool for multiple types of malignancies. CAR T cells are T cells engineered to express a cancer-specific receptor (the CAR) on their surface. These cells are expanded to large numbers and transfused into the patient where the CAR receptor allows the T cells to identify cancer cells that express the targeted antigen and destroy them anywhere in the body. The five FDA approved CAR T therapies have demonstrated efficacy in patients who are refractory to standard chemotherapy with many patients entering remission after treatment. However, a high number of these patients relapse within a few months. Relapse may result from ineffective targeting of low antigen expressing malignant cells and/or the inability of CAR T cells to persist for a long period of time after infusion.

Technical Innovation

A team led by Dr. M. Eric Kohler has designed novel bicistronic CAR T constructs that show improved sensitivity to tumors with low levels of antigen which persist longer in animal models compared to clinically active CD22 CAR T cells. The novel constructs increase the activating signal produced by a second-generation CARs in order to improve anti-tumor activity. In vivo mouse model studies have demonstrated that these novel constructs are able to cure mice of leukemia that express low levels of CD22 antigen which are incurable with standard, clinically proven CD22 CAR T cells. The inventors also found that their CAR T constructs were able to persist for a greater length of time compared to standard CAR Ts, preventing relapse of leukemia at late time points which occur in mice treated with standard CAR T cells. The inventors believe their constructs will be beneficial for the treatment of numerous blood cancers as well as solid tumors.

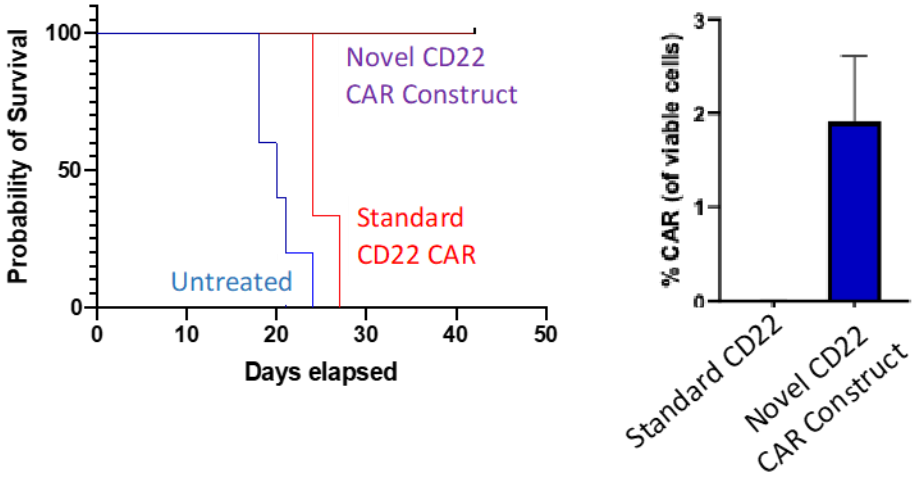

Figure: Left) Leukemic mouse models demonstrated improved survival with novel CAR T construct (purple line) compared to standard CAR T (red line) and control (blue line). Right) Novel CAR T cells persisted in mice for 50 days, whereas standard CD22 CAR T cells were undetectable at this timepoint.