Chimeric Antigen Receptor Natural Kills Cells for Therapy of B Cell Malignancies

Reshmi Parameswaran, PhD, Paolo Caimi, MD
Department of Biomedical Engineering, Case Western Reserve University

Need

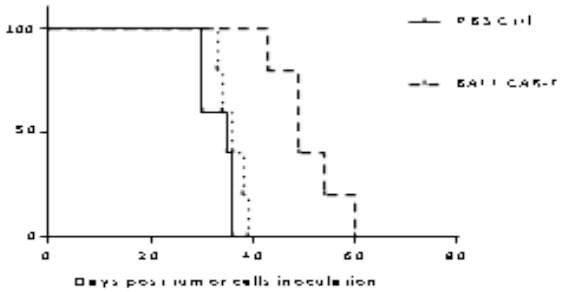
Leukemia is the second leading cause of death from cancer among children in the United States. Acute Lymphoblastic Leukemia (ALL) is the most common childhood cancer in the United States. About 20% of these children will develop resistance to the chemotherapy, and there is no standard treatment for these children. Drug resistance and relapse are serious problems in the treatment of ALL. Currently, a combination of three to four chemotherapy drugs used for treating all B cell cancer patients including ALL patients and sometimes stem cell transplant or steroids are also added to the treatment regimen. These intense therapies often end up with severe side effects.

Patients who do not respond to conventional chemotherapy treatment methods are treated with autologous CD19 CAR-T cells. CD19 CAR-T can be used to treat B cell malignancies as all of the B cells express CD19. CD19 CAR-T cells have demonstrated remarkable success in the treatment of B-ALL. However, CD19-negative relapses are seen in around 20–50% of patients. Repeating of CD19 CAR T treatment is often not an option because most patients are losing CD19 the surface of B-cells.

Solution

Our research team has developed a BAFF CAR T cell therapy that address r/r ALL patients who are resistant to CD19 CAR T cell therapy and patients who are r/r to chemotherapy and not eligible for the CD19 CAR T. Additionally, our technology has a potential to treat all other B-cell malignancies given the same underlying cancer biology. Under normal conditions, the bone marrow produces stem cells that become early B cells, a type of white cell, among others. As they mature, the B cells grow certain receptors on the cell surface and B cell activating factor receptor (BAFF-R) is one among them.

Results



BAFF CAR-T injected mice also showed prolonged survival. We expect a similar efficacy with BAFF CAR-NK cells as both CAR's target receptors of BAFF

Solution (con't)

BAFF is a protein which can bind to this receptor and helps the survival of mature B cells.

Our technology similar efficacy with BAFF CAR-NK cells as both CAR's target receptors of BAFF, but with additional advantages. These include no or minimum side effects, is made from an off-the-shelf products, can be injected multiple times to the patient, has a short life, and NK cell origin.

Opportunity

We seek commercialization partners with commitment to and a leadership position in global health issues. Opportunities for collaboration may take a variety of forms, including: license of IP; participation directly or in conjunction with a private equity investor in a startup to develop and commercialize the technology; sponsored research.

Intellectual Property

Nonprovisional patent application was filed in June 2020.

Contact: Kris Kamp, Licensing Manager,
CWRU Technology Transfer Office
Kris.kamp@case.edu or (216) 368-2026

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