

Novel Immunotherapy for Cancer Treatment: Chimeric Antigen Receptors Targeting CD70 Antigen

► Asset Overview

Product Type	CART
Indication	Oncology
Current Stage	Preclinical
Target(MoA)	Chimeric Antigen Receptors Targeting CD70 Antigen
Brief Description	<ul style="list-style-type: none"> • Scientists at the NCI's Surgery Branch have developed anti-CD70 chimeric antigen receptors (CARs) to treat cancers. CD70 is an antigen that is expressed on a variety of human cancers such as renal cell carcinoma, glioblastoma, non-Hodgkin's lymphoma, and chronic lymphocytic leukemia.
Organization	National Institutes of Health

► Differentiation

□ Technology

- They have developed anti-CD70 chimeric antigen receptors (CARs) to treat cancers. CD70 is an antigen that is expressed on a variety of human cancers such as renal cell carcinoma, glioblastoma, non-Hodgkin's lymphoma, and chronic lymphocytic leukemia.
- The anti-CD70 CARs are hybrid proteins consisting of a receptor portion that recognizes CD70 antigen, and intracellular T cell signaling domains selected to optimally activate the CAR expressing T cells.
- Genetically engineered T cells that express this CARs will bind to CD70 on the cancer cells and will be activated to induce an immune response that promotes robust tumor cell elimination when infused into cancer patients.
- This technology can rapidly generate a vigorous T-cell response from the patient's own blood, targeting CD70 expressing cancer cells, and potentially induce tumor rejection.

□ Potential Commercial Applications

- Immunotherapeutics to treat cancers that overexpress CD70, such as renal cell carcinoma, glioblastoma, non-Hodgkin's lymphoma, and chronic lymphocytic leukemia.
- A personalized cancer treatment strategy for patients whose tumor cells express CD70 whereby the patient's own T cells are isolated, engineered to express the anti-CD70 CARs, and re-infused into the
 - same patient to attack the tumor(s).

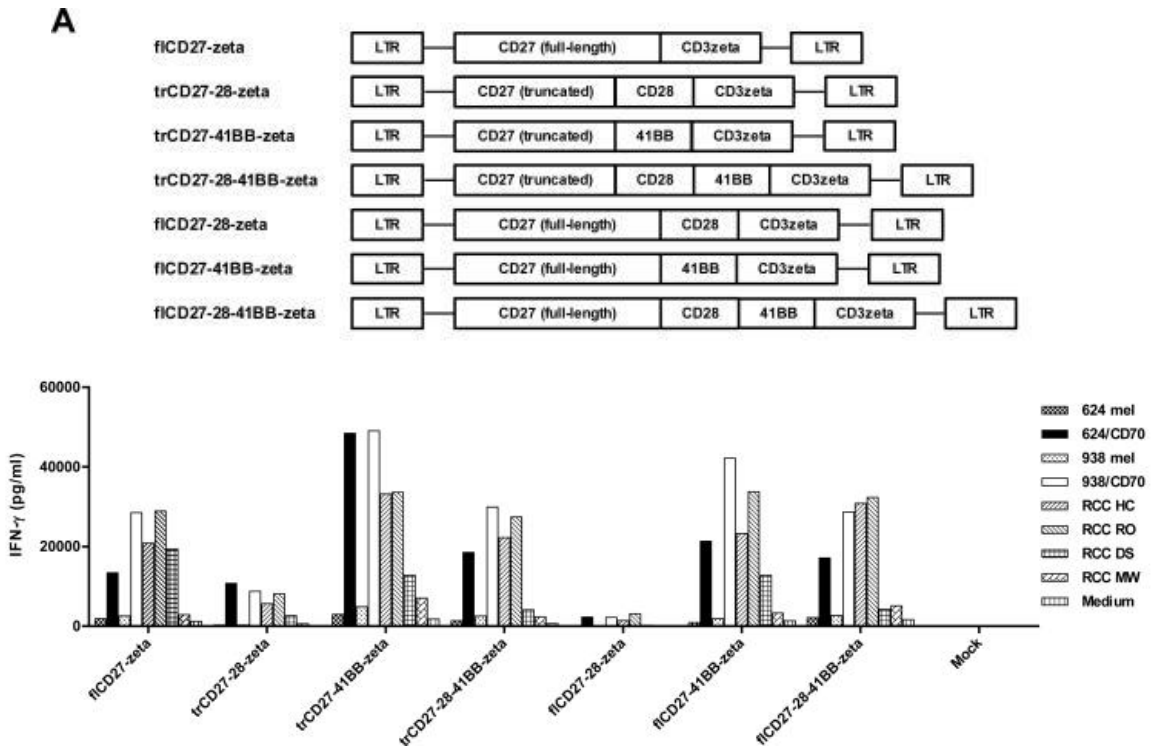
□ Competitive Advantages

- CD70-specific CARs expressed on T cells will increase the likelihood of successful targeted therapy.
- CAR-T cells targeting only CD70 expressing cells and thus may generate fewer side effects than other cancer treatment approaches..
- T-cell transfer can provide much larger numbers of anti-tumor immune cells compared to other approaches such as vaccines.
- With the advent of Provenge(R), and Yervoy(R), immunotherapy is now more widely accepted as a viable cancer treatment option.

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► Key Data

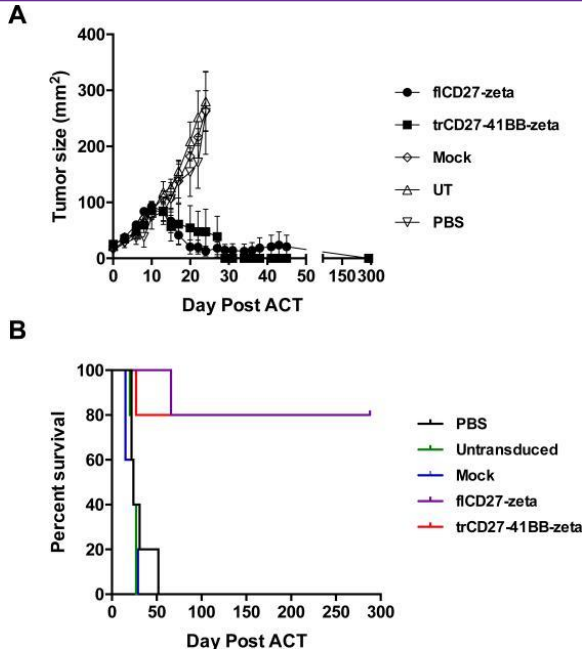
The reactivity of anti-human CD70 CARs against CD70-expressing tumors in vitro



Seven anti-human CD70 CARs with binding moieties from human CD27 combined with CD3-zeta and different costimulatory domains from CD28 and/or 41BB were constructed. The CAR consisting of the extracellular binding portion of CD27 fused with 41BB and CD3-zeta (trCD27-41BB-zeta) conferred the highest IFN γ production against CD70-expressing tumors in vitro,

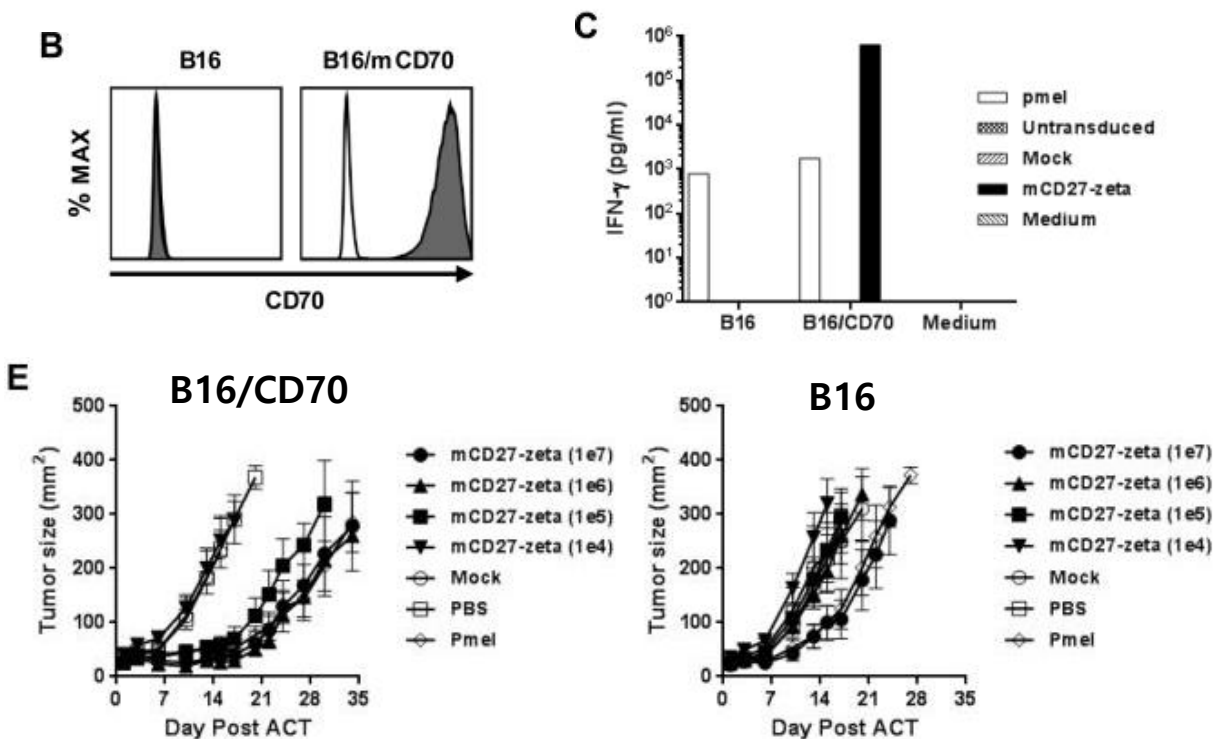
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Anti-tumor effect of Antisense-based Cancer Therapeutic



Adoptive cell transfer of anti-human CD70 CAR-transduced cells treating human cancers in NSG mice.. NSG mice bearing established CD70-expressing human tumors could be cured by human lymphocytes transduced with this CAR.

Anti-tumor effect of Antisense-based Cancer Therapeutic



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► Intellectual Property

Patent No.	US 2018-0208671 A1
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Status	Registered
Country	US, EP, JP, CN, AU, CA

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